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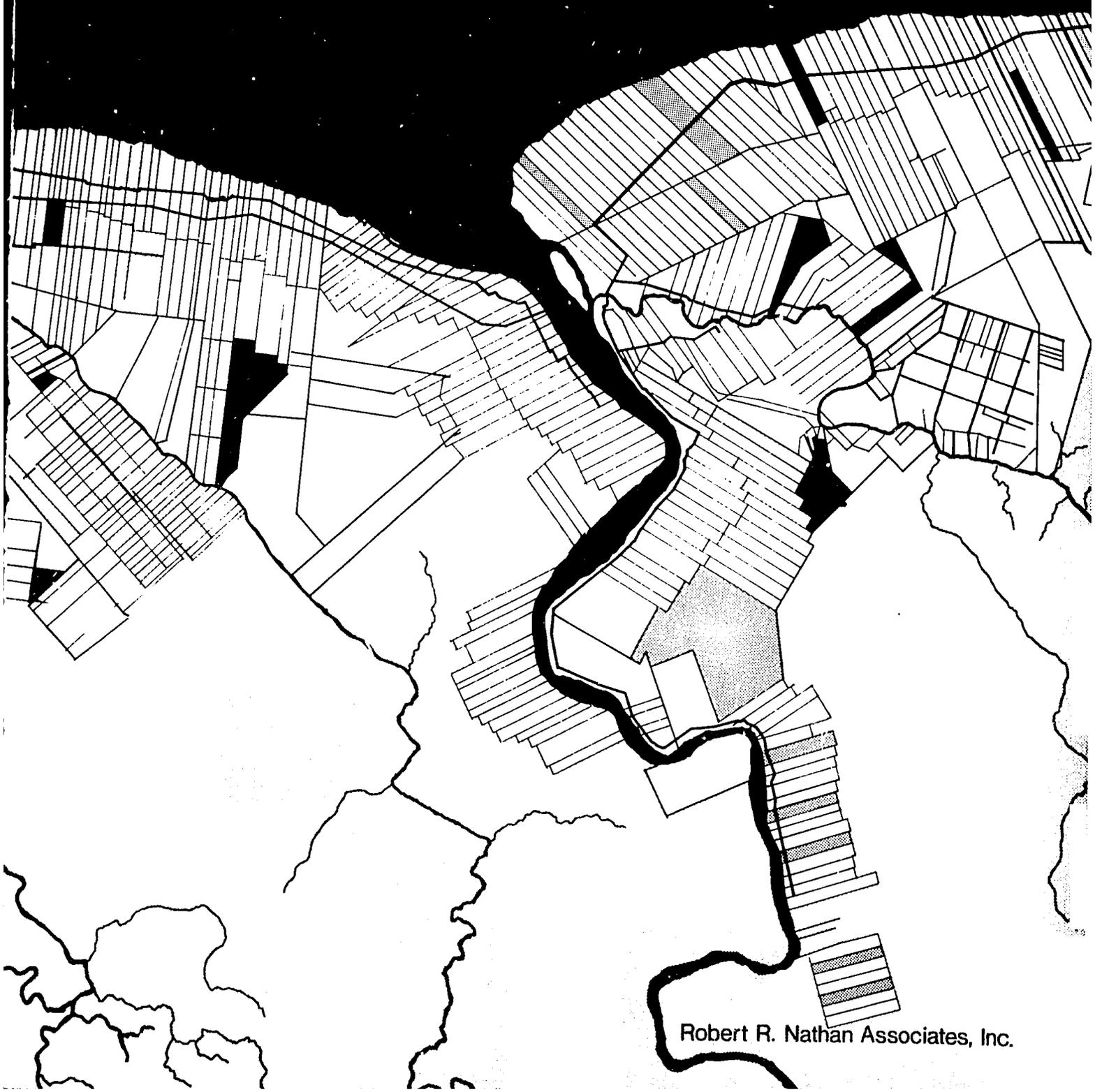
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# INCOME & PRODUCTION OF Guyana Rural Farm Households



Robert R. Nathan Associates, Inc.

THE INCOME AND PRODUCTION OF  
GUYANA RURAL FARM HOUSEHOLDS

An Analysis Based On The 1979  
Guyana Rural Farm Household Survey

Prepared for  
The Ministry of Agriculture, Government of Guyana  
and  
The U.S. Agency for International Development  
Under Contract No. AID-504-INST-781

by  
Robert R. Nathan Associates, Inc.  
Washington, D. C.

April 1980

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## PREFACE

### The Nature of this Report

This report is prepared under the sponsorship of the U.S. Agency for International Development (USAID) in conjunction with the Guyana Ministry of Agriculture. It is intended for use by the USAID/Guyana Mission in its discussions and planning with the Government of Guyana toward further cooperative development programs. It is also designed to serve USAID/Guyana in fulfilling congressional and USAID-mandated responsibilities for reporting and analyzing the situation of the poorest sectors of the population in countries which receive U.S. development assistance, especially of the people living in rural areas. It is the hope of the authors and the USAID Mission that the report will also be useful to the agencies of the Government of Guyana as a contribution to their own work of planning and program development in the agricultural sector.

The report is part of a broader effort by USAID and the Government of Guyana to improve the information available on the agricultural sector in the country. The report is based primarily on the new information available from the 1979 Survey of Rural Farm Households conducted by the Government of Guyana with financial and logistical assistance sponsored by USAID.

### Participants

The major participants of the Government of Guyana in the survey and in the discussion of results were staff members of the Statistical Bureau, the Ministry of Economic Development, and the Ministry of Agriculture, including the Mahaica-Mahaicony-Abary Authority (MMA). Representatives of a number of related government agencies have provided commentary on various issues raised in the draft of this report which was presented in Guyana in January 1980.

The Rural Development Office of USAID/Guyana was responsible for the administration and support of this project in conjunction with the Bureau for Latin America and the Caribbean, Office of Development Resources, Rural Development Division (LAC/DR/RD) of USAID Washington.

2.

Robert R. Nathan Associates, Inc. (RRNA) served as consultant to the Government of Guyana and USAID on the data requirements for analysis, questionnaire content, training manual, specification of tables, and review of data. RRNA is also responsible for this analytical report.

The U.S. Bureau of the Census (BUCEN) served as consultant to the Government of Guyana and USAID on the design, conduct and quality control of the survey, the design of the questionnaire, the programming and the processing of the data. Documentation of these sections of the survey is being prepared by BUCEN.

### Purpose and Scope

The purpose of the survey was to obtain reliable national and regional estimates of the following:

- . Incomes of rural farm households with and identification and detailed profile of the low-income target group;
- . Acreage and production of crops and livestock;
- . Use and potential of various agricultural programs.

Farm households and other farm operations without an associated household were surveyed; tabulations were prepared for both farm households alone and for the larger farm group of all farms, including corporate and certain absentee-owned operations. This report focuses only on the farm households.

This report contains a number of summary tables, but it does not review all of the data obtained by the survey. The complete data tabulated to date are available in computer printouts and provide the results for household and corporate farms in different regions and sub-regions, as well as data by acreage, household income and type of farm households. Further tabulations are expected to be prepared by the Guyana Statistical Bureau. An extensive selection of the computer printout of the data is to be published by the Government of Guyana as a statistical document. The tables in this report are based on the printouts of the results dated January 4, 1980.

There were several major exclusions from the scope of the survey: the Rupanuni and all of the hinterland except the Northwest District; the farming operations of GUYSUCO; the farm households which resided abroad or in the urban

areas of Georgetown, New Amsterdam, and Linden; the special farm operations of the Guyana Defense force; and other government entities engaged in agricultural information.

### Definitions

The key definitions related to this survey are:<sup>1</sup>

Rural farm household - a household living in a rural area which had at least one household member operating a farm.

Household - according to the definition used by the Government of Guyana, a group of persons living together, sharing at least one daily meal and sleeping most nights of the week at the household location.

Farm - an economic production unit having access to land suitable for producing crops and livestock, and, in fact, producing minimally significant amounts of either. Practical limits were set to include the control by the farm operation of at least one of the following criteria: a half acre of land; 5 head of cattle; 3 sows; 10 sheep or goats; or 100 chickens, ducks, geese or turkeys. In addition, the gross value of production in 1978 must have been G\$50.00 or more, provided that any value of production below that amount was not caused by crop failure; long crop gestation period of new crops; late plantings; undertaking of farm infrastructure works or land preparations which are incomplete; or temporary curtailment of farming activity.

Net household income - receipts from all production plus the value of home consumption, less farm expenses, plus all types of off-farm income. The annual value of owned and rent-free housing was excluded, which means that incomes of most rural households would be somewhat greater than the amount attributed to them. According to the usual practice in the definitional income, gifts and non-earned remittances from family and friends were omitted from household income.

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1. Details of the calculation of certain derived variables are presented in Appendix A.

The net household income includes the net return<sup>1</sup> to all productive factors -- capital, labor, and management.

### The Survey Responses

The survey households were selected by a two-stage random sampling process and the interviews were conducted from January to March 1979. A total of 2,306 valid responses were received, of which 2,284 represented farm households. The remaining were the corporate farms and farm units not directly associated with a particular farm household. The responses were expanded to an estimate of 24,635 farm households for Guyana, which suggests a possible decrease of some 3,000 to 4,000 farms since the last enumeration in 1967.

The period of reference for the survey was generally the calendar year 1978. In the case of land holdings, inventories of livestock and machinery, and household attributes, the period of reference was the date of the interview in early 1979. These dates are indicated in table headings.

### Reliability of Results

The main issue regarding the reliability of the data from the Farm Household Survey concerns the estimate of the total acreage and production of rice. The survey estimate of total riceland is almost one-third below that obtained from the Guyana National Farm Registry. (The Registry provides a complete inventory of agricultural land in the control areas with details on its general use.) Survey estimates of production for 1978 are below the levels reported by the Guyana Rice Board in about the same proportion. The Survey estimate for acreage and production of the

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1. The capital investment of the farm households was calculated along with the annual depreciation. However, because of recent import restrictions on parts and machinery, much of the equipment on farms has appreciated sufficiently to offset some or all of the depreciation. In many cases owners estimated that their used machinery had gained in value. In other cases the reverse was true. Thus, if depreciation values had been taken into account, it would have created substantial differences in the estimation of income of farm households that would have reflected mainly the differences in accounting methods and in individual judgments of machinery value, rather than actual income differences. Consequently, changes in machinery values were omitted from the calculation of net income. Even though this change in the value of machinery has not been included in the income calculations, it has been estimated and included in the general reporting of the survey results.

major crops of sugar cane, coconuts, and corn is generally consistent with the Registry and with current estimates of production prepared by the Ministry of Agriculture.

These problems relate more to the estimates of national and regional totals than they do to the averages and proportions. At this time, indications are that for this purpose the data are sufficiently reliable for the type of analysis presented in this report.

In the initial discussion of results with officials of the Ministry of Agriculture, continued interest was expressed in the ability and intent of farm household respondents to report their incomes accurately. This was an important concern as well of all participants in the preparation of the Farm Household Survey, and was reflected in the design and pretest of the questionnaire, the training of interviewers, and the editing of the completed questionnaires. There are many indications that the averages on household income are reliable. The results appear to be internally consistent; the individual revenue and expenditure items are consistent with other available information. Furthermore, the rates of earnings per person working off the farm are highly consistent with the initial unpublished results from the 1977 Labour Force Survey and other sources of wage data.

Estimates have been prepared of the range of statistical reliability resulting from the sampling process. For example, it has been calculated that barring any serious non-sampling error, the actual number of farm households in Guyana should be within 10 percent of the 24,634 survey estimate with a 95 percent level of confidence. The range of potential variability will be greater for many of the household and farm characteristics, particularly for sub-categories such as regions and sizes of farms. The statistical variance is quite low for items related to average household incomes, including the incomes of the target and non-target subgroups. For those target group households which reported some positive income, the estimates of average household income are ascertained to be within five percent of the true value at a 95 percent level of confidence. Computer printouts with the calculation of the variance for the results are in the possession of the Ministry of Agriculture and the Statistical Bureau.

#### The Organization of this Report

Chapter 1 provides a summary of the major findings of this report and their implications for program and policy development.

Chapter 2 of this report discusses the setting of agriculture in the Guyana national economy, both its domestic and international sectors. It also considers the Guyana goals for economic and agricultural development as well as the U.S. goals for its foreign assistance program.

Chapter 3, on the income of rural farm households, presents a comparative analysis of the target and non-target groups in terms of total income, household characteristics related to income, off-farm and farm sources of income, and the receipts and expenditures which determine the farm portion of net income.

Chapter 4 presents the total capital used in terms of land, livestock and machinery by target and non-target households. Aspects of land use for different size farms are analyzed.

Chapter 5 focuses on the productivity and efficiency of farm production of the target and non-target households, as measured not only by yields, but also by net economic returns. The problems of obtaining needed supplies, services, and credit are also considered.

## CHAPTER 1. FINDINGS AND IMPLICATIONS

### An Overview

A clearer picture of the economic situation of Guyana farm households emerges from the results and analysis of the 1979 Rural Farm Household Survey. This picture of farm households contributes to a better understanding of the performance of the Guyana agricultural production sector. The survey results also provide insights into the causes and interrelationships contributing to the conditions, trends, and problems which have been observed in rural Guyana in recent years.

This paper does not provide the answer to the problems of rural Guyana and Guyanese agricultural development; it is diagnostic rather than prescriptive. It invites those concerned with Guyana's agriculture to engage in further analysis and discussion and to resolve the questions which are critical for the development of public policies and programs.

A primary purpose of this report is to identify in some detail the potential "target group." This effort is consistent with one of the major objectives for U.S. assistance to developing countries -- to focus aid on the poorest sectors of the populace -- and to point toward some policy and program directions which such assistance might take in concert with the Government of Guyana. The feasibility and desirability of pursuing the indicated direction must be determined through in-depth analysis and the weighing of a wide range of policy considerations, some of which lie outside the scope of agricultural issues.

The most important findings that contribute to the clearer picture are cited briefly. Farming contributes only one-third to the incomes of rural farm households. Only one third of the farm households are able to achieve the U.S. or Guyana target income levels and less than 1 in 15 can achieve this from farming alone.

The higher-income farm households have somewhat more and higher quality farm resources and manage them somewhat better than the lower-income households. Point for point the differences are not great. But even so, these households are able to achieve much greater economic returns from farming. At the same time, these households generally deployed a far higher proportion of their adult members in income-producing off-farm work.

The returns from farming in 1978 seem to have been exceptionally low. This could well have been a phenomenon unique to 1978, the year of reference for the survey; however, other studies and general knowledge suggest that this was not entirely so. Rice farming, on the average, appeared to provide net returns which were among the lowest of returns among farm enterprises, while farmers' cane and broiler production generally provided the highest net returns. Foodcrops, as a group, and other livestock were intermediate in terms of these average net returns.

These findings suggest substantial economic policy implications which must be the subject of serious questioning and further analysis and research. The fact that income from farming is not the only concern of most Guyana farm households may explain partially why farmers at times may not have been as responsive to national initiatives to improve agriculture as may be expected by public officials.

The findings also indicate a potential for improved benefits and income. It is apparent that improved productivity and economic efficiency have already been achieved by some farm households with the kinds of resources currently in use. A comparison with the higher income producers shows that there is a potential for increases in productivity and efficiency on low-income farms through an emphasis on improved management, more so than through increases in capital and capital-intensive import-based technologies. An important aspect of this is improved water control.

One of the most important policy questions raised by the survey results relates to the above mentioned low returns from the growing of rice. This is more than a matter of improvement of management, as important as this may be, since relatively low returns were recorded even by the more efficient producers.

Further research into the factors allowing some farms to produce higher net incomes is a starting point for program development to improve the lot of Guyanese farmers and

the rural sector in general. In addition, some pilot programs could be developed to include a number of initiatives to test alternative farmer organizations for providing machinery services and other farm inputs, more effective extension methods, more appropriate credit services, and more intensive training in farm management. But even so, improved opportunity and efficiency in farming will not always provide the optimal solution. In addition, a search for opportunities to expand off-farm employment in rural areas should be an integral part of future planning to utilize more fully the comparatively well-educated and available rural farm workforce.

### The Major Findings

The clearer picture of the economic well-being and performance of farm households and of agriculture in Guyana portrays the following elements:

- . Two-thirds of the rural farm households had annual incomes below the U.S. target level for development assistance of G\$600 per capita; four-fifths had incomes below the Guyana target of G\$6,000, which is about G\$900 per capita.
- . Almost two-thirds of the income of the rural farm households comes from sources other than their own farms, with most of this coming from wages in non-agricultural work.
- . The "target" households, those with less than G\$600 per capita, averaged only 20 weeks per year of employment off the farm compared to 62 weeks for the non-target households.
- . The target households received lower incomes from farming and considerably lower rates of pay for off-farm work.
- . Virtually all rural farm households appear to have been adequately fed regardless of their incomes. This was partly because of a substantial amount of home consumption of farm products, especially for low-income households.
- . On the average, the target group households tended to be slightly larger with slightly

1-4.

fewer adults of working age. Their heads of household were slightly less experienced in farming and fewer had agricultural training.

- . Per capita incomes from all sources were not closely related to farm size among households with farms of small and medium size.
- . Total net farm returns -- representing returns to capital, labor, and management -- were lower than comparable returns to such factors from non-farm endeavors.
- . The target households' farmed lands were generally less well-drained and had less adequate access to water for irrigation; these households spent less per acre for land improvements than the non-target households.
- . More than one-fourth of all farm households reported losses on their farming operations in 1978, but only 10 percent had negative total incomes because the losses were offset by off-farm earnings.
- . The households with negative incomes were quite evenly distributed throughout the rural farm populations, occurring in all regions and on farms of all sizes and types.
- . The more efficient non-target rice farms realized a net return of about G\$100 per acre planted, while the target households barely broke even.
- . The techniques of rice farming, including the use of fertilizer and machinery, were highly uniform among rice producers in Guyana. And for the most part, production was highly dependent on purchased inputs, a substantial part of which was from imported sources.
- . Sugar cane was among the more profitable crops produced by farm households.

- . "Food crops," excluding farmers' cane, produced considerably higher average net income per acre than rice.<sup>1</sup>
- . Livestock, other than broiler production, produced a comparatively low return for farm households. However, households whose farming operations depended mainly on livestock had more off-farm earnings and above average per capita incomes.
- . About one third of the farm households reported difficulty in getting desired services and production inputs from public and private sources. Rice producers especially reported a high incidence of difficulty in getting machinery services when needed.

#### Some Important Questions

The findings which emerged from the first analysis of the farm household survey raise several significant questions regarding Guyana's agricultural programs and policies. These program and policy questions are posed here for two reasons: first, because the response to these questions can have a significant bearing on the development of Guyana's agriculture, which in turn has a direct impact on the generation of additional income and employment opportunities in the rural sector and on the serious foreign exchange problem confronting Guyana; and secondly, to encourage the continued utilization of the survey results and further research data in the analysis and assessment of program and policy alternatives.

Following are some of the significant policy and program questions for Guyana's agricultural sector:

- . The recognition that income from farming is a minor part of total rural farm household income on the average: what implications does this have for the design and content of

---

1. "Food crops" was a term coined for the 1974 RRNA Food-crop Sector Study. It was defined to include all crops other than rice and sugar cane. Unless otherwise specified, the term is applied in this report to include all farm-produced crops except rice. The term thus includes farmers' cane, but not the operations of GUYSUCO which were excluded from the survey.

government agricultural programs and policies? More specifically, what changes may be required in the design of government programs, for example, in which land settlement and the formation of new farm households are undertaken?

- . What steps can be taken by organizations within the agricultural sector, as well as by other Government organizations, to realize the potential -- and to create more opportunities -- for off-farm employment?
- . Differences in the quality of farm management explain a significant part of the variation in productivity and output of farms; is the potential for increased agricultural output through better farm management a realistic potential and, if so, what steps can be taken to realize this potential? The significance of this question goes beyond simply increasing agricultural output, for if such a potential exists it means that increased output can be accomplished -- and with this output increased income and employment opportunities -- without a commensurate increase of imported technology.
- . To what extent can the profitability of rice production be increased through higher farm gate prices for rice and/or improved use of agricultural inputs?
- . To what extent, and through what methods, can the use of high cost imported inputs (particularly fertilizer and machinery) be improved, thus increasing agricultural output, farm household incomes, and employment opportunities with more efficient utilization of scarce foreign exchange?
- . There is a substantial amount of land within existing farms that is not cropped; what steps can be taken to encourage farmers to increase the amount of land under cultivation?
- . Another factor contributing to variations between farms in terms of agricultural output

and productivity is the quality of on-farm water control; what steps can be taken to bring about improvements in water control on farms that are within the management of the farmer?

These are indeed challenging questions -- and they are only some of the questions that arise from the findings from this survey -- but the fact remains that Guyana's agricultural sector faces a most significant challenge. This challenge has two dimensions. On the one hand, there is a need to bring about changes in income and employment opportunities in the rural sector if Guyana's agricultural objectives, which form an integral part of achieving broader national objectives, are to be realized. And, on the other hand, Guyana's foreign exchange problems both constrain the opportunities for development in agriculture and at the same time indicate agriculture as probably the most important sector for ameliorating Guyana's foreign exchange difficulties.

Information is always a scarce resource. The gathering of data and its formation into an information base is a costly exercise and, once created, it provides an opportunity for analysis leading to improved decisionmaking which the absence of information does not provide. The Rural Farm Household Survey provides Guyana with an information base, the breadth and quality of which Guyana has not had available since 1952. It is a readily accessible information base that will enable Guyana's policymakers and analysts in a variety of organizations to address these very questions as well as many others that may be specific to particular crops, regions and specific programs. While the overall objective of this report is to provide insights on the characteristics and behavior of the Guyanese farm household, an objective of equal importance is to encourage the utilization of this new information base and the building on this base in further research efforts.

The findings which emerged from the first analysis of the farm household survey raise several significant questions regarding Guyana's agricultural programs and policies. These program and policy questions are posed here for two reasons: first, because the response to these questions can have a significant bearing on the development of Guyana's agriculture which in turn has a direct impact on the generation of additional income and employment opportunities in the rural sector and on the serious foreign exchange problem confronting Guyana; and second, to encourage the continued utilization of the survey results in the analysis and assessment of program and policy alternatives.

## CHAPTER 2. AGRICULTURE IN THE NATIONAL SETTING

Agriculture is a major source of production, growth, and foreign exchange in the Guyana economy. The dominant export crops of sugar and rice in agriculture, with their extremely high dependence on foreign imports, have made their contribution to economic growth and to the well-being of farmers. However, the export revenues and the costs of imports are erratic and uncertain, as they vary with the widely fluctuating conditions characteristic of international markets for commodities and agricultural inputs.

The proposed plans for future agricultural development recognize the need to reduce the dependence of the economy on these two export crops. Nonetheless, the economy is so strongly oriented to these two commodities and the need for foreign exchange for other developmental purposes is so urgent that Guyanese plans continue to include further expansion of sugar and rice in addition to increased production of other commodities.

### Agriculture in the National Economy

Agriculture and related activities have dominated the Guyanese economy for a long time, ranking second only to the services and distribution sectors in the national accounts.

Agriculture averaged about 29 percent of Gross Domestic Product (GDP) over the period 1972-1978 (Table 2-1). In addition, the economic interdependencies between agriculture and the food and beverage processing, transport, and service sectors indicate that as much as 50 percent of GDP is functionally dependent on the level of agricultural output. The proportion of GDP from agriculture reached a high of 39 percent in 1975 at the peak of the boom in international sugar prices. However, two years later, when the international commodity market slumped, the contribution by agriculture fell sharply to 23 percent, the same level as in 1972. But despite this erratic performance, agriculture made an increasingly important contribution to the growth of GNP between 1972 and 1978. Sugar and rice together averaged close to 80 percent of the value of all agricultural output, and 50 percent of the value of exports between these years.

Table 2-1. Gross Domestic Product at Current Factor Cost  
(Millions of Guyana dollars)

|                                       | 1972 | 1973 | 1974 | 1975  | 1976  | 1977  | 1978 <sup>b</sup> |
|---------------------------------------|------|------|------|-------|-------|-------|-------------------|
| Agriculture                           | 121  | 121  | 328  | 427   | 280   | 236   | 316               |
| Sugar <sup>a</sup>                    | 77   | 67   | 250  | 333   | 191   | 104   | 180               |
| Rice <sup>a</sup>                     | 11   | 16   | 31   | 42    | 30    | 58    | 50                |
| Livestock                             | 12   | 13   | 18   | 20    | 24    | 26    | 32                |
| Fishing                               | 6    | 7    | 9    | 10    | 10    | 13    | 14                |
| Other                                 | 15   | 18   | 20   | 22    | 25    | 35    | 40                |
| Food, beverage and tobacco processing | 19   | 20   | 22   | 28    | 34    | 34    | 34                |
| Forestry                              | 6    | 6    | 8    | 10    | 10    | 10    | 11                |
| Other manufacturing                   | 22   | 24   | 27   | 42    | 47    | 53    | 52                |
| Mining and quarrying                  | 90   | 80   | 115  | 141   | 145   | 164   | 171               |
| Transport and communication           | 33   | 37   | 46   | 50    | 55    | 58    | 60                |
| Construction and engineering          | 43   | 47   | 53   | 73    | 85    | 77    | 75                |
| Services and distribution             | 195  | 241  | 271  | 326   | 382   | 380   | 415               |
| Total                                 | 529  | 576  | 870  | 1,097 | 1,038 | 1,012 | 1,134             |

a. Includes milling.

b. Preliminary.

Source: 1972, 1973, Bank of Guyana, 1977 Annual Report; 1974-1978, IMF, Guyana-Recent Developments, June 5, 1979.

About 90 percent of the sugar and 50 percent of the rice were exported.

### Agriculture and Foreign Trade

The preponderant role of a foreign-dependent agriculture in the Guyanese economy leaves it highly susceptible to factors outside the control of policymakers. The agricultural-based economy is affected considerably by varying weather conditions at home and abroad. However, these variances, when superimposed on more fundamental changes in foreign competition and market demand, make the economy exceedingly vulnerable to sharp shifts in the country's foreign exchange position. This situation is aggravated further by the considerable dependence of agriculture and the rest of the economy on the imported inputs required by the currently-needed technologies. This vulnerability is reinforced by similar uncertainties in the production and international sale of bauxite and related products which constitute Guyana's other main export. In sum, economic growth is subject to an unusual degree of uncertainty despite the fact that it is partly moderated by the protected markets and long-term contracts which Guyana has negotiated.

The "double jeopardy" of weather and international markets is reflected especially in the erratic balance of trade performances over recent years (Table 2-2). After 1973 the sharp increases in world prices for Guyana's exports provided an abundance of foreign exchange, leading the country to sharply increase its imports, particularly of intermediate and capital goods. These imports undoubtedly helped to improve the productivity of the nation. But at the same time they further increased Guyana's dependence on foreign inputs and markets.

In 1976 the favorable terms of trade ended. World prices for bauxite, sugar and rice declined so sharply that imports exceeded exports by about 30 percent, thus creating the largest trade deficit in the history of Guyana. In 1977 export prices declined further and some modest adjustments were made. But even though the trade deficit was reduced it was still the second largest in history. In 1978, sharply increased export volume and effective restrictions on imports permitted a moderate reversal of the deteriorating reserves situation.

The impact of this economic disaster will probably be felt for much of the next decade, especially in agriculture. Shortages of critical imported inputs of items such as livestock feeds, machine parts, tools, fertilizers, and farm chemicals will undoubtedly limit farm output. This, along

Table 2-2. External Balance of Trade and Payments, 1972-78

(Millions of Guyana dollars)

| Item                         | 1972       | 1973       | 1974       | 1975       | 1976        | 1977              | 1978 <sup>a</sup> |
|------------------------------|------------|------------|------------|------------|-------------|-------------------|-------------------|
| Merchandise exports (+)      | 300        | 288        | 602        | 858        | 711         | 661               | 754               |
| Merchandise imports (-)      | <u>298</u> | <u>373</u> | <u>567</u> | <u>811</u> | <u>927</u>  | <u>804</u>        | <u>710</u>        |
| Balance of trade             | 2          | -85        | 35         | 47         | -216        | -143              | 44                |
| Services and transfers (net) | <u>-25</u> | <u>-39</u> | <u>-65</u> | <u>-89</u> | <u>-145</u> | <u>-106</u>       | <u>-115</u>       |
| Balance on current account   | -23        | -124       | -30        | -42        | -361        | -249              | -71               |
| Overall balance              | 20         | -43        | 65         | 108        | -234        | -158 <sup>b</sup> | 51 <sup>b</sup>   |

a. Preliminary.

b. Commercial arrears increased G\$83 million in 1977 and were reduced by G\$26 million in 1978. The overall balance of payments therefore reflects a decline and an increase of international reserves of G\$75 and 25 million in 1977 and 1978, respectively.

Source: 1972, 1973 - Bank of Guyana, 1977 Annual Report; 1974-1978, IMF, Guyana-Recent Economic Developments, June 5, 1979.

with pressures to maintain or increase exports, will contribute to the inflation of food prices unless food supplies can be increased through means that are minimally dependent on foreign input-based technologies. This suggests that consideration be given to more extensive and more efficient utilization of Guyanese land and labor resources or assurances that the marginal benefits from the use of import dependent technologies exceed the costs when both are adequately discounted for future uncertainty.

The foreign exchange predicament has forced sharp reductions in the amount of farm inputs that were allowed to be imported since 1975 (Table 2-3). In absolute terms the imports of fertilizers, chemicals, machinery fuels and livestock feeds declined from the peak of G\$149 million in 1975 to G\$104 million in 1977. Even so, this represented a sharp and continuing increase in relation to the value of agricultural production. In 1973 imported inputs represented only 24 percent of the agricultural contribution to the GDP. In 1977 they were 45 percent. This suggests that a drop in the value of farm production far exceeded the drop in cost of the foreign inputs to agriculture.

The extreme vulnerability of Guyana agriculture to foreign impacts suggests the need to plan for more balanced growth, growth in which the basic domestic part of the economy is somewhat more dependent upon domestic inputs of capital, locally-based technologies and labor and is considerably less dependent on foreign inputs. A significant turn in this direction may, however, take most of the next decade to achieve and will not come about without the sacrifice of intermittent spurts of rapid growth that import-dependent technologies can provide. The choice is, in effect, to obtain a balance between two interacting economies -- a basically stable, moderately growing home economy that is largely dependent on domestic inputs and trade and a less stable foreign-based economy that holds the uncertain promise of spurts of rapid growth.

### Goals, Plans and Policies

#### Guyanese Priorities

Drafts and discussion relating to the Third Development Plan of Guyana for 1977-81 -- although not representing official decisions -- indicate the direction of thinking on agriculture within the Government and represent a modified extension of the previous plan with a continued substantial emphasis on agriculture.

Table 2-3. Agriculturally Related Imports, 1972-77  
(Millions of Guyana dollars)

|                                 | 1972        | 1973        | 1974        | 1975        | 1976        | 1977        |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <u>Food imports</u>             | 37.9        | 37.5        | 69.6        | 75.1        | 94.7        | 86.7        |
| <u>Imported farm inputs</u>     |             |             |             |             |             |             |
| Livestock feed                  | .3          | .4          | .4          | 6.8         | 13.9        | 10.0        |
| Fertilizers and chemicals       | 7.3         | 8.9         | 18.0        | 26.0        | 21.9        | 14.5        |
| Machines and equipment          | 4.1         | 9.9         | 14.2        | 52.9        | 22.0        | 11.6        |
| Fuels and lubricants            | <u>25.8</u> | <u>10.2</u> | <u>50.2</u> | <u>63.3</u> | <u>65.0</u> | <u>68.3</u> |
| Total imported farm inputs      | 37.5        | 29.4        | 82.8        | 149.0       | 122.8       | 104.4       |
| Percent of GDP from agriculture | 31          | 24          | 25          | 35          | 44          | 45          |

Source: Statistical Bureau, Ministry of Economic Development, special unpublished tabulations prepared for the project team.

The planning is still dominated considerably by the goal to feed and clothe the nation. It directs a substantial effort to strengthening the domestic economy, minimizing dependence on imports, and maximizing exports. For the overall economy, it aspires to:

- . Reduce unemployment and its associated problems of unequal distribution of income.
- . Reduce dependence on bauxite, sugar and rice as sources of foreign exchange.
- . Improve the short-term productivity of public investments which had in the past concentrated largely on infrastructure.
- . Mobilize internal financial resources to a much greater degree.

The basic thrusts and strategies for the development of the agricultural sector are a continuation from the previous plan, although there appear to be some modest changes in emphases. The second plan, for example, had placed great emphasis on the development of the Guyana hinterland, particularly the intermediate savannahs and the Northwest region. This still is an important objective; however, it has been moderated by a greater emphasis on increasing employment opportunities in farming in the coastal areas. The new plan gives somewhat more recognition to the potential for increasing the productivity of unused lands and underemployed labor existing side by side in the coastal areas.

The planning for the agricultural section of the third development plan aims to:

- . Increase production of corn, legumes, fluid milk, cotton, vegetable oils, cassava and some vegetables;
- . Improve nutrition levels for people and variety in consumption;
- . Increase production of sugar and rice for export through acreage and yield expansion;
- . Produce for export beef, pork, poultry, eggs, fish, pineapple, plantain, yams, vegetable and citrus;
- . Develop the processing of cassava, oil palm, pineapple, citrus, cashew, vegetables, and cotton;

- . Achieve an average income per farm household of no less than G\$6,000 per annum;
- . Create 20,000 new jobs in agriculture, fisheries and related industries; and,
- . Continue the education of farmers and of the nation as a whole as to the central importance and dignity of agriculture as an occupation.

These are essentially goals for achievement in the performance and well-being of the private sector in agriculture which still dominate Guyana agricultural production and marketing. The attainment of these goals will depend to a large extent on the incentives, policies and economic climate provided for the private sector--the farm households of Guyana.

The 1974 Food Crop Sector study showed a substantially underutilized managerial capability in the private farming sector. It would seem that the new plan's desire to exploit this more fully is well-founded and has potential especially in that the managerial capacity of the public sector may be establishing itself as an important factor in limiting progress. Thus, while the new plan places a great deal of the responsibility for its implementation on the public sector, it also hopes to develop additional managerial capacity and to draw more resources into agriculture by a combination of public and private means which include:

- . Encouraging farmers to organize themselves in production groups and agricultural cooperatives;
- . Having the public sector supplement private efforts in the production of certain crops and livestock activities, especially those requiring large capital investments and heavy machinery;
- . Having the Ministry of Agriculture, through the Agricultural Coordinating Committee, exercise greater control over public sector enterprises to ensure their production targets are met;
- . Providing incentives to the private sector and cooperatives including the development of infrastructure, credit and duty-free imports of essential farm inputs;

- . Utilizing local resources -- people and land -- to the maximum extent and limiting imported inputs to only the most critical needs;
- . Increasing training available for farmers, extension personnel, technicians, professionals, and managers;
- . Improving water control for crop production in the coastal areas;
- . Developing access and feeder roads and improved river transportation to facilitate settlement in the riverine and hinterland areas;
- . Making available suitable lands at low rentals and transferring good lands not used beneficially to those willing to put them to productive use;
- . Encouraging better management and practices in crop and livestock production;
- . Providing mechanical aids for small farming;
- . Re-orienting and injecting new capital into the Guyana Marketing Corporation and broadening its role as a wholesale and export marketing agent.

It is clear that several of the foregoing emphases are directed to expanding the country's scarce capacity for management. This is critical to the successful implementation of the Third Plan. But the rapidly increasing scope of the public sector is of some concern.

A brief survey of managerial personnel in agriculture and related offices in 1974 found that: For its size, the Guyana Government has a fairly large staff of individuals trained in agriculture, including about 100 who have one or more university degrees. These professionals are supported by about 170 people with certificates and diplomas from the Guyana School of Agriculture or from similar institutions in the Caribbean area. Since 1974 there have been few additional trained persons added. It is questionable whether this has been sufficient to cover the multitude of added

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1. Robert R. Nathan Associates, Inc., Guyana's Foodcrop Systems: An Analysis for Development Planning, June 30, 1974, p. 239.

managerial responsibilities brought on by the drive to achieve rapid economic progress. The available talent is being spread exceedingly thin.

It seems logical to look to the addition of the GUYSUCO management force in 1976 to supply some of the much needed managerial capability to implement the new plan. But it is questionable whether this addition is a real net gain because the GUYSUCO enterprises still need to be operated. There is no indication that they had developed any significant excess managerial capacity now or prior to nationalization. Thus, some caution may be justified to assure that the management base essential to the GUYSUCO's own operations is not eroded to its own detriment.

### U.S. Aid Intentions

Planning documents of the U.S. Agency for International Development recognize the need for external assistance to shore up Guyana's weakened balance of payments position and the need for the country to decrease its dependence on the international economy. Within this framework, planning documents indicate an interest in the following supportive actions:

- . Encouraging the Government to adopt viable economic development policies, including a clear role for the private sector to play in creating new productive jobs in Guyana and increasing exports;
- . Assisting the Government in continuing its efforts to increase sharply the level of national savings and to overcome the current financial and balance of payments problem. Several of the private sector activities will contribute to this goal and a Title III Food For Peace program may also be designed to support this objective;
- . Helping the Government to strengthen key institutions in the country, both public and private. All major new activities will place heavy emphasis on institutional strengthening by stressing training and management improvement;
- . Helping to finance priority activities of the GOG to increase production and improve the conditions of the lower income groups in Guyana, especially those with annual incomes of less than G\$600 per capita, as required by

U.S. foreign assistance legislation and USAID directives.<sup>1</sup>

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1. G\$600 in 1978 is the approximate equivalent of U.S.\$150 in 1969, when this target was first mandated. The U.S. Consumer Price Index increased 70 percent from 1969 to 1978, indicating a 1978 equivalent target level of US\$267 per capita. This is the equivalent of G\$680 in terms of the official 1978 exchange rate (U.S. \$1.00 = G\$2.55). However, since the income data commonly used in Guyana and also the income estimates of the Rural Farm Household Survey do not include the annual value of owned or rent-free housing, the G\$600 is an appropriate standard for a careful estimate of the target population in Guyana. In some of the international determinations made by USAID, the target level for Latin America is adjusted upward by a factor of 1.83, to account for the higher cost of living in the region compared with that in developing regions of Africa and Asia. If the target level for Guyana were adjusted by this factor, more than 85 percent of the Guyana Rural Farm Household Population would have fallen below the resulting G\$1,000 target level, compared with the 67 percent which fell below the G\$600 level. The higher adjusted amount could be useful for indicating the relative extent of poverty in Guyana in comparison with other countries and regions. However, since almost all Guyana rural farm households fall below the higher amount, it would not provide a very useful standard for identifying the households and persons in Guyana with the most serious income deficiencies, nor for analyzing differences among lower and higher income groups.

## CHAPTER 3. THE INCOMES OF RURAL HOUSEHOLDS

### An Overview of Farm Household Incomes

In 1978 about 16,400 Guyana farm households, two thirds of those in the country, had annual incomes below the U.S. development-assistance target of G\$600 per capita. Four fifths of the farm households had incomes below the Guyana goal of G\$6,000 per household, or G\$900 per capita (Table 3-1). The average income for all rural farm households was approximately G\$3,400, about G\$500 per capita (Table 3-2).

A primary purpose of this report is to identify and describe in detail those rural farm households which fell within the U.S. development-assistance target range. The target households were not dramatically different from their more affluent neighbors in terms of many of the demographic characteristics of households, including location, size, age and experience of the household head. But the small differences between the target and non-target groups were related somewhat to income differences, so that their combined effect appears to have been significant.

Several factors combined to make a substantial difference in the amount of time the target and non-target household members spent in off-farm employment, a characteristic which made a large difference in income. The much higher off-farm incomes the non-target households enjoyed was directly related to this greater time in off-farm employment. A higher average rate of earning from off-farm work plus higher farm earnings were substantial factors as well.

The proportion of off-farm work and earnings serves as an important introduction to understanding the farm situation of Guyana. In 1978, more than three-fifths of the income of rural farm households came from sources other than their farms, mainly non-agricultural work (Table 3-3).

On the average, the proportion of farm household income from farming is lowest in two of the important agricultural areas, West and East Berbice (Table 3-4). It was highest in the Northwest and Pomeroun, undoubtedly reflecting the more limited non-farm income opportunities in that region.

Table 3-1. Number of Farm Households<sup>a</sup> by Farm Household Income Per Capita, 1978

(Guyana dollars)

| Farm household income per capita | Number of households |                  | Percent of households |                  |
|----------------------------------|----------------------|------------------|-----------------------|------------------|
|                                  | Income group         | Cumulative total | Income group          | Cumulative total |
| 0 or less                        | 2,849                | 2,849            | 11.6                  | 11.6             |
| 1-49                             | 1,571                | 4,420            | 6.4                   | 18.0             |
| 50-149                           | 2,590                | 7,010            | 10.5                  | 28.5             |
| 150-299                          | 3,840                | 10,850           | 15.6                  | 44.1             |
| 300-599 (U.S. target)            | 5,549                | 16,399           | 22.6                  | 66.7             |
| 600-899 (Guyana goal)            | 3,161                | 19,560           | 12.9                  | 79.6             |
| 900-1,499                        | 3,109                | 22,669           | 12.9                  | 92.3             |
| 1,500-2,999                      | 1,463                | 24,132           | 6.0                   | 98.3             |
| 3,000 and over                   | 439                  | 24,571           | 1.8                   | 100.0            |

a. Excludes 63 households for which total household income was not ascertainable.

Source: Computer printout table 181.

Table 3-2. Income of Farm Households, by Region, 1978

| Region                      | Income                      |            | Households in target group as proportion of Guyana total | Households in target group as proportion of area total |
|-----------------------------|-----------------------------|------------|--|--|
|                             | Per household               | Per capita |  |  |
| Guyana total                | --Guyana dollars--<br>3,403 | 504        | 100.0  | 66.7   |
| Northwest and Pomeroon      | 2,775                       | 379        | 8.0  | 78.0   |
| Essequibo Coast and Islands | 3,055                       | 467        | 20.8   | 69.0   |
| West Demerara               | 4,691                       | 670        | 10.4   | 55.4   |
| East Demerara               | 4,432                       | 653        | 19.0   | 56.1   |
| West Berbice                | 3,430                       | 500        | 8.2  | 61.3   |
| East Berbice                | 2,422                       | 367        | 33.6   | 77.6   |

Source: Computer printout table 255A.

3-4.

Table 3-3. Sources of Farm Household Income, by Farm Household Income Per Capita, 1978

(Guyana dollars)

| Household income per capita       | Income per household |          |         | Farm as percent of total |
|-----------------------------------|----------------------|----------|---------|--------------------------|
|                                   | Total                | Off-farm | Farm    |                          |
| Total                             | 3,403                | 2,220    | 1,183   | 34.8                     |
| 0 or less                         | (1,084)              | 265      | (1,349) | --                       |
| 1-49                              | 194                  | 144      | 50      | 25.8                     |
| 50-149                            | 661                  | 354      | 307     | 46.4                     |
| 150-299                           | 1,474                | 788      | 686     | 46.5                     |
| 300-599                           | 3,192                | 2,217    | 975     | 30.5                     |
| Average for target households     | 1,360                | 1,050    | 310     | 22.8                     |
| 600-899                           | 5,069                | 3,441    | 1,628   | 32.1                     |
| 900-1,499                         | 7,174                | 4,906    | 2,268   | 31.6                     |
| 1,500-2,999                       | 10,427               | 6,336    | 4,091   | 39.2                     |
| 3,000 and over                    | 17,633               | 4,390    | 13,243  | 75.1                     |
| Average for non-target households | 7,504                | 4,567    | 2,937   | 39.1                     |

Source: Computer printout tables 255,255A.

Table 3-4. Sources of Farm Household Income,  
by Region, 1978

(Guyana dollars)

| Region                         | Income per household |              |       | Farm as<br>percent<br>of total |
|--------------------------------|----------------------|--------------|-------|--------------------------------|
|                                | Total                | Non-<br>farm | Farm  |                                |
| Guyana total                   | 3,403                | 2,220        | 1,184 | 34.8                           |
| Northwest and<br>Pomeroon      | 2,776                | 1,134        | 1,441 | 51.9                           |
| Essequibo Coast<br>and Islands | 3,055                | 1,695        | 1,360 | 44.5                           |
| West Coast<br>Demerara         | 4,691                | 2,639        | 2,053 | 43.8                           |
| East Demerara                  | 4,432                | 2,903        | 1,530 | 34.5                           |
| West Berbice                   | 3,430                | 2,770        | 660   | 19.2                           |
| East Berbice                   | 2,422                | 1,911        | 511   | 21.1                           |

Source: Computer printout tables 255, 255A.

This lesser importance of farming as a source of income for farm households has considerable significance for future program and policy developments related to agriculture. In particular, it suggests that farm households may not always give farming the same high priority that is assigned by public officials responsible for such developments, nor the priority that is consistent with the importance of agriculture in the national economy.

To be sure, the importance of agriculture in the livelihood of rural farm households is only partially indicated by the income from their own farms. Some of the households' off-farm earnings also came from work on other farms and from farm-related activities. When all of these are considered, about half of the total income of the average rural farm household was derived from farm work (Table 3-5). A significant proportion of the off-farm employment was work for the Guyana Rice Board, private rice mills, the Guyana Marketing Corporation, transportation, and processing meat, milk, eggs, and other agricultural products. About three-fifths of the target households' income was from work on their own or other farms.

The farming operations that directly provided the remaining one-third of the net incomes were highly varied in terms of profitability, the products that were produced, and the inputs used to produce them. Generally, the net incomes from farming yielded relatively small returns to the factors of production -- land, labor, capital, or management. Even if zero returns were assigned to capital, land and management, the return to farm labor would be less than \$500 per year per worker -- much less than the annual wage from work on sugar estates.

The low return is punctuated by the fact that more than one quarter of all farm households reported net losses on their farming operations. These were found to occur in both the target and non-target groups and were quite evenly distributed among the farms of different sizes, different regions, and different types of agricultural concentration. The primary difference between those target and non-target groups with negative farm incomes was that the farm losses of the latter were more than offset by their substantial off-farm earnings. The negative farm income households, on the other hand, depended more heavily on the consumption of their own farm products.

The difference in net farm income between the target and non-target households was, to an important degree, due to differences in the suitability, the quality and the productivity of the resources at the disposal of the household.

Table 3-5. Income Per Household by Source of Income, Target and Non-target Farm Households, 1978

|  | Target households |                         |       | Non-target households | All households |
|--|-------------------|-------------------------|-------|-----------------------|----------------|
|  | Income 0 or less  | Income 1-599 per capita | Total |                       |                |
| -----Guyana dollars-----   |                   |                         |       |                       |                |
| Total income per household   | (1,106)           | 1,894                   | 1,367 | 7,533                 | 3,403          |
| Net farm income  | (1,378)           | 684                     | 316   | 2,965                 | 1,183          |
| Non-farm income  | 272               | 1,210                   | 1,051 | 4,568                 | 2,220          |
| Wage earnings in agriculture   | 35                | 384                     | 325   | 842                   | 497            |
| Non-agriculture earnings   | 78                | 640                     | 544   | 3,231                 | 1,435          |
| -----percent-----  |                   |                         |       |                       |                |
| Net farm income as proportion of total income                                  | --                | 36.1                    | 23.1  | 39.4                  | 34.8           |
| Non-farm income as proportion of total income                                  | --                | 63.9                    | 76.9  | 60.6                  | 65.2           |
| Net farm income and wage earnings in agriculture as proportion of total income | --                | 56.4                    | 46.9  | 50.5                  | 49.4           |

Source: Computer printout tables 249A, 250, 255, 255A.

But seemingly of equal importance was the way in which farm enterprises were run. The quality of management cannot be directly observed per se, but it is reflected in the choice of, or switch to, farm enterprise combinations with the potential for higher returns and in the efficiency with which those enterprises are operated.

For the target group households as a whole, rice was by far the most significant source of revenue, while the non-target households depended on a broader range of agricultural revenue sources, including substantial receipts from sugar cane. Livestock and poultry, and related animal products, were not a major source of revenue for most farm households.

In general, a relatively high level of cash expenditures reflects a high level of modernization and commercialization of farming operations. Yet, the relatively high expenditures of the target group households, in comparison with the non-target group, indicated poorer management and less efficient operations and in some cases relatively high cost for the operation of machinery, given the nature of their farming operations.

Within Guyana, the rural farm households with low incomes appear to be an especially suitable target group for development programs intending to increase incomes through improving productivity. Households headed by a farmer in 1977 were much more likely to fall into the AID target group than households headed by a person employed for wage in agriculture. Also the rural part of the country had a higher concentration of households with incomes below the target level than did the main urban areas.

Despite the considerable disequality of incomes in Guyana, policies and programs in the country appear to have provided a good access to the necessities of life for most households, as indicated by the National Quality of Life Index and by the relatively equal levels of food consumption for all income groups in the farm household population.

#### Characteristics of Farm Households

The "target" farm households, those with low per capita incomes, were quite evenly distributed throughout Guyana, although there were some differences in the distribution. In every region more than one-half of the farm households fell into the target group. The highest proportion of target households lived in East Berbice and in the Northwest and the Pomeroon. There, nearly 80 percent of the farm households had incomes below the U.S. target group. The lowest

proportion of target households was in West Demerara where only 55 percent were in that category.

Several characteristics of the farm households seemed to be correlated with the level of their incomes. Although the differences between the target and non-target groups were not great, they cumulatively had an impact on per capita income. One such factor was family size. The target households had an average of seven persons per family (Table 3-6). This was, on the average, only about 10 percent larger than the non-target group, which averaged somewhat over six persons. This difference would have had an effect on per capita income of some G\$25 to G\$50 since a given family income would be divided among more persons.

Another factor which probably affected the income producing capacity of the target households was their smaller number of working-age persons. The low-income group had a ratio of 0.9 non-working age persons (0-13 and over 65) per person of working age, whereas the higher-income households had only 0.7 such persons per working-age household member. This alone would account for as much as one fifth of the difference in average income per capita, if one could assume that off-farm job opportunities and farm earnings were completely equal for each group. However, as the survey results show, earning abilities and the earnings themselves appear greater for the non-target households.

The characteristics of the heads of farm households of the target and non-target groups were only slightly different on the average (Table 3-7). As one might expect, the heads of the low-income households were slightly younger, slightly less well-educated in formal schooling and agricultural training, and slightly less experienced in farming than the heads of non-target households. This suggests that the higher income households might have tended to be headed by slightly more effective managers, a condition which could be associated with a higher earning capacity in both farm and non-farm endeavors.

Despite these slight differences in managerially related characteristics, there is the overriding fact that a generally high level of education and farm experience exists in Guyana. More than nine out of ten household heads in both the target and non-target groups had some schooling. This suggests that there is a strong potential for improving the managerial capacity needed to support private sector agricultural development. The fact that only one household head in five had ever attended an agricultural seminar or short course suggests even further that this avenue for managerial improvement may not have been fully exploited.

Table 3-6. Demographic Characteristics of Target and Non-Target Farm Households, 1979

| Household characteristics  | Target households | Non-target households | All households |
|--|-------------------|-----------------------|----------------|
|  | -----persons----- |                       |                |
| Number of persons per household  | 7.0               | 6.3                   | 6.8            |
|  | -----percent----- |                       |                |
| Males 14-65, proportion of total                                       | 29.0              | 34.4                  | 30.7           |
| Females 14-65, proportion of total                                     | 25.9              | 30.1                  | 27.2           |
| Total persons 14-65, proportion of total                               | 56.6              | 66.4                  | 59.7           |
| Children under 14, proportion of total                                 | 40.3              | 30.0                  | 37.1           |
| Adults over 65, proportion of total                                    | 3.1               | 3.6                   | 3.3            |
| Dependents (children under 14 and adults over 65), proportion of total | 43.4              | 33.6                  | 40.3           |
|  | -----ratio-----   |                       |                |
| Ratio of dependents to persons 14-65                                   | 0.9               | 0.5                   | 0.7            |

Source: Computer printout tables 186, 187.

Table 3-7. Characteristics of Households Heads, Target  
and Non-target Farm Households, 1979

| Household head<br>characteristic                                  | Target<br>households | Non-target<br>households | All<br>households |
|---|----------------------|--------------------------|-------------------|
|   | -----years-----      |                          |                   |
| Average age   | 48.6                 | 50.4                     | 49.2              |
| Average years<br>farming experience                               | 17.6                 | 17.8                     | 17.7              |
|   | -----percent-----    |                          |                   |
| Proportion who attained<br>various highest levels<br>of schooling |                      |                          |                   |
| None  | 9.0                  | 8.0                      | 8.7               |
| Primary 1-4   | 48.8                 | 39.8                     | 45.9              |
| Primary 5 or more   | 36.3                 | 41.1                     | 37.9              |
| Secondary   | 5.9                  | 10.9                     | 7.5               |
| Proportion who attended<br>agricultural<br>course or seminar      | 19.2                 | 24.4                     | 20.9              |
| Proportion female   | 11.7                 | 13.6                     | 12.3              |

Source: Computer printout tables 181-184.

In all the above factors, there were no important differences between the averages for male and female headed households.

### Sources of Household Income

#### Off-Farm Income

The low-income target households have fewer members in the regular and well-paying jobs in sugar estates and in non-agricultural work for wages (Table 3-8). Almost three out of five of the non-target households had at least one member engaged in regular work for wages, but only one target family in four had someone so employed.

Off-farm earnings from agricultural work were more than 2.5 times as high for the non-target group as they were for the low-income families. But because of the dominance of non-agricultural work for the non-target group, agricultural work was relatively more important off farm activity for the target households (Table 3-9). The earnings from off-farm agricultural work accounted for one-fourth of the earnings of the target group households, with sugar estates accounting for most of that. For one out of nine of the target households, sugar estate earnings accounted for most of their total household income.<sup>1</sup>

On the average, wages from non-agricultural work were the single most important source of income for both the target and non-target groups. However, the target farm households received only one-sixth as much income from this kind of work as did the non-target units. Self-employment generally was not very significant; only about nine percent of all farm households engaged in such activity. Some of these households ran their own shops, carried on trades, drove taxis, or fished (Table 3-10). Non-earned income from pensions and savings was generally not very important.

#### Off-farm Employment

The non-target households averaged 62 weeks a year of off-farm work by adult household members, three times the average of the target group. This difference in off-farm employment accounts for two-thirds of the substantial difference in average household income for the two groups. In turn, the differences in the amount of off-farm work seem to be associated with two main factors: the number of adult members of working age and the ability of some households to

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1. Based on data in Computer printout tables 249, 255, 255A.

Table 3-8. Farm Households Receiving Income from Off-farm Sources, Target and Non-target Farm Households, 1978

(percent of households in income status group)

| Source of income                | Target households | Non-target households | All households |
|---------------------------------|-------------------|-----------------------|----------------|
| Agricultural work for wages     | 14.5              | 20.9                  | 16.4           |
| Sugar estates                   | 11.5              | 17.9                  | 13.5           |
| Other agricultural work         | 3.0               | 3.0                   | 3.0            |
| Non-agricultural work for wages | 24.7              | 58.8                  | 35.7           |
| Self-employment                 | 8.5               | 9.5                   | 8.7            |
| Non-earned income               | 19.2              | 24.5                  | 20.8           |

Source: Computer printout tables 249, 249A, 250, 251, 252.

Table 3-9. Total Income Per Farm Household and Total from  
Off-Farm Sources, Target and Non-target Farm Households,  
1978

(Guyana dollars)

| Sources of Income           | Target households | Non-target households | All households |
|-----------------------------|-------------------|-----------------------|----------------|
| Total household income      | 1,360             | 7,505                 | 3,403          |
| Total off-farm income       | 1,050             | 4,567                 | 2,220          |
| Agricultural work total     | 325               | 841                   | 496            |
| Sugar estates wages         | 290               | 785                   | 454            |
| Other agricultural work     | 35                | 56                    | 42             |
| Non-agricultural work total | 718               | 3,694                 | 1,704          |
| Work for wages              | 543               | 3,224                 | 1,432          |
| Self-employment             | 113               | 341                   | 188            |
| Non-earned income           | 62                | 129                   | 84             |

Source: Computer printout tables 249, 249A, 250, 251, 252, 255, 255A.

Table 3-10. Non-farm Self Employment and Earnings,  
Target and Non-target Farm Households, 1978

| Item   | Target<br>households     | Non-target<br>households | All<br>households |
|--|--------------------------|--------------------------|-------------------|
|  | -----Percent-----        |                          |                   |
| Proportion of total households   |                          |                          |                   |
| Households with one<br>or more family<br>member in self-<br>employed occupa-<br>tion, business<br>or trade | 8.5 <sup>a</sup>         | 9.4 <sup>a</sup>         | 8.7 <sup>a</sup>  |
| Shop or stores   | 1.5                      | 4.1                      | 2.4               |
| Trades   | 2.6                      | 1.3                      | 2.2               |
| Driving taxi   | 1.8                      | 1.6                      | 1.7               |
| Fishing  | 1.4                      | 0.2                      | 1.0               |
| Other businesses and<br>professions  | 1.4                      | 2.8                      | 1.9               |
|  | -----Guyana dollars----- |                          |                   |
| Average earnings per<br>household <sup>b</sup>   |                          |                          |                   |
| Shops or stores  | 1,780                    | 3,358                    | 2,695             |
| Trades   | 1,006                    | 1,375                    | 1,081             |
| Driving taxi   | 1,675                    | 3,848                    | 2,356             |
| Fishing  | 825                      | 3,410                    | 1,036             |
| Other businesses and<br>professions  | 1,327                    | 4,112                    | 2,704             |

a. The sums of occupational percentages are greater than total because some households have more than one non-farm self-employed occupations.

b. Includes return to household capital and labor.

Source: Computer printout table 251.

free some of the adults from farm work for employment outside the farm. Of these two factors, the second appears the most important (Table 3-11).

Low-income households had an average of 4.0 adults from ages 14-65 years, compared with 4.2 adults for the non-target households. This small difference in adult family size accounted for a potential annual difference of 12 work weeks per household between the two groups.

A large part of the difference between the target and non-target household averages for off-farm work was related to the differences in the disposition of family labor on and off the farm. The target households had an average of two persons who worked only on the farm -- that is, persons working on the farm who did not go to school or work elsewhere. In contrast, the non-target households, despite their larger farms, used less than an average of 1.5 person-years for work only on the farm. This provided an additional 29 person-weeks of household-member time available for off-farm work.

Furthermore, the persons reported as being on the farm all the time were not necessarily fully employed. In fact, they were probably not; one in five of them in the target households reported seeking off-farm work, while the ratio was one in seven for the non-target group.

For the adult household members not working only on the farm and not in school, the rate of off-farm employment was less than one-third for the target households, but well over one-half for the non-target group.

In all, there is a remarkable number of persons with apparent surplus work time residing in the farm households. Of course, availability would be much less at peak times in seasonal demand for workers, especially during the rice and cane harvesting periods. Nevertheless, four adults per household are likely to represent considerable labor surplus almost all the time, given the extent of farm mechanization in the country. This group certainly constitutes a significant potential human resource for more intensive cultivation of currently used farmlands, for establishing production on idle or new lands, and for increasing off-farm agricultural processing and non-agricultural production. Furthermore, the surplus indicates not only a less-than-optimal use of work time but also of the full energy and education of some of the country's highest potential workers. For example, only about one of ten young men age 21-29 residing in a farm household is currently listed as a farm household head.<sup>1</sup>

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1. Estimate based on Computer printout tables 185, 186.

Table 3-11. Household Labor Availability Per Household,  
Target and Non-target Farm Households, 1978

| Item   | Target<br>households   | Non-target<br>households | All<br>households |
|--|------------------------|--------------------------|-------------------|
|  | -----Persons-----      |                          |                   |
| Number of persons 14-65  | 4.0                    | 4.2                      | 4.0               |
|  | -----Person weeks----- |                          |                   |
| Potential time of labor<br>available <sup>a</sup>                  | 206                    | 218                      | 210               |
| Amount of Time of person<br>working only on the<br>household farm  | 102                    | 73                       | 92                |
| Total Time of persons<br>engaged off the<br>farm                   | 60                     | 103                      | 75                |
| Time in school   | 21                     | 23                       | 22                |
| Time worked  | 20                     | 62                       | 33                |
| Time unaccounted of<br>person engaged off<br>the farm <sup>c</sup> | 19                     | 19                       | 19                |
| Time unaccounted for <sup>b</sup>                                  | 44                     | 42                       | 43                |

a. Based on rounded totals of number of persons 14-65 at 52 weeks per person.

b. This is time of persons aged 14-65 who are not identified in any hole of employment on or off the farm or school activity.

c. This includes time on vacation, in on-farm work or unemployed.  
Source: Computer printout tables 186, 246, 247.

In every category of off-farm work, workers of the target group earned considerably less total pay than did the workers from the non-target households (Table 3-12). This difference reflects not only the lower number of weeks worked per worker but also indicates a lower average rate of earnings. The average wage of the workers from the low-income households was G\$50 per week -- only about two-thirds the average for the non-target workers.

### Farm Income

Fully two-thirds of the households reported less than G\$1,000 net income per household from farming, even without the subtraction of an imputed charge for family labor, capital and depreciation (Table 3-13). On the basis of farming alone, more than 9 out of 10 households would have fallen below the U.S. target income of about G\$4,000 per household for the year.

Most of these negative income households were in the target group, but one in six also fell into the non-target group. Virtually all had non-farm income to help offset the losses from farming; yet, over 40 percent had insufficient off-farm income to accomplish this fully. As a result, when all sources are considered, nearly 12 percent of all farm households in Guyana had negative incomes.

The incidence of farm losses in 1978 was widespread among farms of different sizes, locations, and types of operations. It was not, as one might think, a phenomenon of small farms or of target households. In fact, large losses from farming were more frequently incurred in the medium size farms of 5 to 25 acres; the very largest losses were on large farms. Over a third of the rice farmers suffered net losses from farming (Table 3-14). The heaviest concentration of losses occurred in West Coast Demerara, West Berbice, and East Berbice.

A household would not be likely to continue in farming with a negative return year after year. Thus, these loss situations are likely to have been a temporary situation in most cases. The fact that a quarter of the farm operations lost money is likely to have resulted in part from the depressed economic conditions in agriculture in 1978. In a more favorable year, this proportion could well have been lower, although this cannot be positively ascertained since there are no other recent comparable data for recent years.

In any year, however, there are likely to be some farms with negative net incomes from farming. This can result

Table 3-12. Amounts Earned Per Worker in Various Types of Non-Farm  
Employment, Target and Non-target Farm Households  
1978

(Guyana dollars)

| Sources of income   | Target households | Non-target households | All households |
|---|-------------------|-----------------------|----------------|
| Sugar estate work for wages   | 2,211             | 3,354                 | 2,749          |
| Other agricultural work for wages   | 966               | 1,649                 | 1,181          |
| Non-agricultural work for wages   | 1,696             | 3,203                 | 2,616          |
| Self-employment   | 1,203             | 3,079                 | 1,899          |
| All off-farm employment,<br>Average earnings per week<br>from all off-farm employment | 50                | 72                    | 63             |

Source: Computer printout tables 247, 249, 249B, 250, 251A, 252.

Table 3-13. Proportion of Households with Various Levels  
of Net Income from Farm Operations, Target and  
Non-target Farm Households, 1978

(Percent of households)

| Net household<br>income farming<br>Guyana dollars | Target<br>households | Non-target<br>households | All<br>households |
|---|----------------------|--------------------------|-------------------|
| Total   | 100.0                | 100.0                    | 100.0             |
| 0 and less  | 32.4                 | 15.8                     | 26.9              |
| 1-299   | 22.2                 | 14.3                     | 19.5              |
| 300-999   | 23.9                 | 18.9                     | 22.2              |
| 1,000-1,999                                       | 12.9                 | 11.4                     | 12.4              |
| 2,000-3,999                                       | 7.3                  | 16.7                     | 10.5              |
| 4,000-5,999                                       | 1.1                  | 7.1                      | 3.1               |
| 6,000-9,999                                       | 0.2                  | 10.1                     | 3.5               |
| 10,000-19,999                                     | 0.0                  | 4.7                      | 1.2               |
| 20,000 and over                                   | 0.0                  | 1.0                      | 0.3               |

Source: Computer printout tables 254 and 254A.

Table 3-14. Proportion of Households with Net Losses  
from Farm Operations by Size of Farm, Region, and Type  
of Farm, Target and Non-target Farm Households, 1978

(Percent of households)

| Item                        | Target households | Non-target households | All households |
|-----------------------------|-------------------|-----------------------|----------------|
| Total Guyana                | 32.4              | 15.8                  | 26.9           |
| Size of Farm:               |                   |                       |                |
| less than 5.0 acres         | n.a.              | n.a.                  | 23.8           |
| 5.00-24.99 acres            | n.a.              | n.a.                  | 30.3           |
| 25.00 acres and over        | n.a.              | n.a.                  | 23.5           |
| Region:                     |                   |                       |                |
| Northwest and Pomeroon      | 15.8              | 7.3                   | 13.9           |
| Essequibo Coast and Islands | 19.8              | 6.2                   | 15.8           |
| West Coast Demerara         | 49.2              | 17.2                  | 34.8           |
| East Coast Demerara         | 23.7              | 11.8                  | 18.5           |
| West Berbice                | 36.1              | 30.1                  | 33.8           |
| East Berbice                | 42.9              | 24.7                  | 38.9           |
| Type of farm:               |                   |                       |                |
| Rice                        | 43.8              | 17.3                  | 37.1           |
| Foodcrop                    | 23.4              | 13.8                  | 19.6           |
| Livestock                   | 35.0              | 15.1                  | 26.8           |
| Mixed                       | 24.9              | 15.1                  | 21.9           |

Source: Computer printout tables 164, 254 and 344.

from a wide range of individual, and sometimes accidental, circumstances that generally do not occur on the same farm year after year. Although there is no way to ascertain this from the survey, it would not be unusual for one farm in ten to suffer temporary farm income losses in any one year and for additional farms to have low incomes for similar reasons.

Home consumption proved to be an important contributor to the welfare of rural farm families, especially the target group. The target households consumed about G\$400 worth of their own produce, valued at the average market price received for cash sales. The home consumption amount was less in absolute terms than that consumed by the non-target group, but was much more important proportionately, representing more than the total net farm income of the target population. In fact, this home consumption of farm produce contributed the equivalent of 30 percent of the net income of these households from all sources, farm and off-farm. More than half the value of the home consumption was in animal products and represented more than half the value of all livestock sales.

#### Expenses-Receipts Ratios

An important aspect of good management of farm enterprises is the achievement of beneficial ratio of expenses to receipts. For any particular enterprise this should be neither too extravagant nor too frugal. About three-quarters of the cash farm receipts of the average farm household was absorbed by cash outlays for production material, including machine and building repairs, rents, fuel, hired labor, taxes, seed, machines, breeding stock, fertilizer and other materials that had to be purchased for growing crops and raising livestock. By most world standards, a ratio this high for purchased inputs suggests the high degree of commercialization of farming that has been reached in Guyana.

About 25 years ago the cash operating expenses averaged only 50 percent of the cash receipts compared to 75 percent today. This implies a current need for more critical management to optimize the level of production inputs than it did 25 years ago. It also makes the farm operation more vulnerable to wide variations in net income.

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1. O. P. Blaich, British Guiana, Department of Agriculture, Agricultural Officer, Agriculture in British Guiana: Census 1952, 1953.

The proportion of farm cash receipts that is absorbed by farm operating expenses varied with the type of enterprise in which the farmer was engaged. It tended to be lowest on foodcrop farms, which were generally less highly mechanized than rice farms and tended to utilize lesser amounts of fertilizers, chemicals, and improved seed. The average foodcrop farm spent only 50 percent of its receipts for input purchases, while the average rice or livestock farm used 88 percent.

To a very significant degree, the expense-receipt ratio also reflects the quality of management. A high ratio suggests the possibility of inefficiency and waste in the use of land, labor, capital, and purchased inputs. In many cases the additional product that was produced from the application of cash inputs was, as indicated, insufficient to yield a positive return from its use. This proposition is borne out by the fact that the non-target households operated with farm expenses at just over one-half of their receipts, while the target group used up all of its cash receipts for purchased inputs and some off-farm income (Table 3-15).

#### Cash Farm Receipts

Crop sales were generally a more important contributor to the gross cash receipts of the farming enterprises than the sales of livestock, poultry and their products. There was little significant difference between the averages of the target and the non-target groups in this respect. Each had over 80 percent of its cash earnings from crops, and only 10 percent of it from livestock products. In both cases, miscellaneous receipts from land rented out, machine work done for others, sales of jams, jellies, hams, casreep and other processed products were relatively unimportant. They amounted to less than five percent of the total receipts in the overall average picture. However, those farms that did this often did so on a significant scale. For example, the average income received from machine custom hire by the few who reported such work was G\$3,440 per household, and those who had processed products for sale averaged G\$340 per household.

Among the crop sales, it was primarily rice, sugar cane, and provisions which contributed to farm cash receipts (Table 3-16). For the non-target farms, rice from both the spring and autumn crops of 1978 contributed to 45 percent of total crop sales, and sugar cane contributed 35 percent. For the target group rice was the only significant contributor, comprising almost 75 percent of all crop marketings.

Table 3-15. Sources of Net Income from Farm Operations,  
Target and Non-target Farm Households, 1978

(Guyana dollars per household)

| Item                    | Target households | Non-target households | All households |
|-------------------------|-------------------|-----------------------|----------------|
| Net income from farming | 358               | 2,983                 | 1,230          |
| Gross cash receipts     | 1,813             | 5,405                 | 3,015          |
| Crop sales              | 1,549             | 4,382                 | 2,501          |
| Livestock sales         | 214               | 829                   | 417            |
| Other sales             | 50                | 194                   | 97             |
| Gross expenses          | 1,893             | 2,970                 | 2,260          |
| Direct crop             | 1,136             | 1,818                 | 1,367          |
| Direct livestock        | 208               | 455                   | 290            |
| Overhead                | 550               | 697                   | 603            |
| Net cash receipts       | -80               | 2,435                 | 755            |
| Home-used produce       | 390               | 504                   | 428            |
| Crops                   | 173               | 196                   | 181            |
| Livestock               | 217               | 308                   | 247            |

Source: Computer printout tables 253,253A.

Table 3-16. Average Value of Sales of Major Crops,  
Target and Non-target Farm Households  
1978

(Guyana dollars per household)

|                  | Target<br>households | Non-target<br>households | All<br>households |
|------------------|----------------------|--------------------------|-------------------|
| Total crop sales | 1578                 | 4407                     | 2501              |
| Spring rice crop | 354                  | 786                      | 496               |
| Autumn rice crop | 794                  | 1,244                    | 942               |
| Sugar cane       | 99                   | 1,559                    | 588               |
| Coconuts         | 28                   | 177                      | 77                |
| Corn             | 20                   | 35                       | 25                |
| Provisions       | 58                   | 97                       | 71                |
| Fruit            | 116                  | 331                      | 185               |
| Other crops      | 87                   | 184                      | 118               |

Sources: Computer printout tables 16, 258, 288, 291, 294, 296, 298, 301.

Among the livestock sales, cattle and poultry were the important contributors (Table 3-17). The sales of cattle and milk together amounted to a third of the total livestock receipts for the average household, while the sales of poultry and eggs constituted about 48 percent. For some farmers, pigs were also important, but not generally. As in the case of crops, the non-target households had substantially higher levels of sales in total and for each of the major items than did the target groups. These sales by non-target households were generally three to five times as high depending on the particular product.

### Farm Operating Expenses

Although the gross farm cash receipts of the non-target households were about three times as high as they were for the target groups, their operating expenses were only about one and one-half times as high (Table 3-18). There were some differences regarding the various types of expenses, but the order of magnitude of the differences was about the same for each group.

Despite these differences in total operating expenses, the average expenses associated with rice production, especially the autumn crop, did not vary much between the two income groups. And, since their respective acreages in rice also did not differ by much, a substantial degree of uniformity in management and in the technology they applied is indicated.

Undoubtedly the Guyana Rice Board has been a major factor in the management of farmers' rice production enterprises. The Board provides advances for seed, fertilizer and chemicals; makes available machinery for planting, harvesting, and hauling the crop to market; and advises on practices and operations. Thus, the Board exercises substantial management influence over rice production.

Because of their slightly larger size of farm operations, the non-target households had somewhat higher expenses in almost every category (Table 3-19). However, on the average there were a few items where the differences were not accountable by size; these were fertilizers and chemicals used, transportation, milling and labor costs, poultry and stock feeds and the purchase of baby chicks. Many of these items were imported.

Production practices and the use of purchased inputs were not nearly as uniform for foodcrops as was the case with rice, even though the Agricultural Extension Service had placed considerable emphasis on the achievement of

Table 3-17. Value of Sales of Major Livestock,  
Poultry and Products, Target and  
Non-target Farm Households,  
1978

(Guyana dollars per household)

|                 | Target<br>households | Non-target<br>households | All<br>households |
|-----------------|----------------------|--------------------------|-------------------|
| Total livestock | 208                  | 825                      | 408               |
| Cattle          | 75                   | 175                      | 107               |
| Sheep and goats | 10                   | 15                       | 11                |
| Pigs            | 38                   | 138                      | 70                |
| Poultry         | 45                   | 333                      | 140               |
| Milk            | 21                   | 49                       | 30                |
| Eggs            | 19                   | 115                      | 50                |

Sources: Computer printout tables 305, 303A, 307, 310,  
312.

Table 3-18. Farm Operating Expenses, Target  
and Non-target Farm Households,  
1978

(Guyana dollars per household)

|                              | Target<br>households | Non-target<br>households | All<br>households |
|------------------------------|----------------------|--------------------------|-------------------|
| Total expenses               | 1853                 | 2906                     | 2211              |
| Direct crop expenses         | 1136                 | 1818                     | 1367              |
| Autumn crop                  | 633                  | 659                      | 644               |
| Spring crop                  | 286                  | 372                      | 316               |
| Foodcrops                    | 217                  | 787                      | 406               |
| Direct livestock<br>expenses | 208                  | 446                      | 290               |
| Poultry purchases            | 24                   | 82                       | 43                |
| Other livestock              | 184                  | 374                      | 247               |
| Overhead costs               | 584                  | 705                      | 623               |
| Rents, wages, raters         | 122                  | 257                      | 169               |
| Machine operation            | 387                  | 377                      | 385               |
| Interior payments            | 70                   | 71                       | 71                |

Source: Computer printout tables 264, 265.

Table 3-19. Major types of Farm Operating Expenses, Target and Non-target Farm Households, 1978

(Guyana dollars per household)

|                                | Target | Non-target | All households |
|--------------------------------|--------|------------|----------------|
| <u>Total Expenses</u>          |        |            |                |
| <u>General</u>                 | 1,944  | 2,992      | 2,273          |
| Rents, Wages, Rates,<br>Taxes  | 122    | 257        | 169            |
| Machine operation (own)        | 392    | 377        | 385            |
| Interest costs                 | 70     | 71         | 71             |
| <u>Crop</u>                    |        |            |                |
| Machine hire                   | 398    | 428        | 404            |
| Seed, Planting Materials       | 78     | 88         | 82             |
| Fertilizer & Chemicals         | 198    | 330        | 240            |
| Bags, Containers, Twine        | 70     | 48         | 63             |
| Transportation and Milling     | 165    | 290        | 205            |
| Labor & Other                  | 230    | 524        | 366            |
| <u>Livestock &amp; Poultry</u> |        |            |                |
| Feed                           | 160    | 347        | 220            |
| Chicks                         | 21     | 80         | 41             |
| Transport, Labor               | 21     | 18         | 16             |
| Medicines, Drugs               | 9      | 16         | 11             |

Source: Same as table 3-18.

foodcrop production increases. However, it was also notable that the target group spent considerably less on purchased inputs for their foodcrop operations than the non-target group. This was partly because they had fewer acres, but primarily because they spent less for fertilizer, machinery and its operation, or for improved planting materials.

Poultry purchases were a significant component of costs for livestock production. This reflects primarily the purchase of baby chicks for a rapidly growing poultry industry. In addition, a substantial amount was spent for purchasing feed, mainly for poultry and pigs. Much of this intensive livestock production was concentrated among the non-target households.

Because of their general nature, roughly one-quarter of the overall operating expenses were classed as "overhead." This included expenses for land, full-time labor, irrigation rates, taxes, machinery operations, real estate improvements, and others that could not be assigned to specific crop or livestock enterprises. The most significant item in this category -- more than half of the overhead for the average household -- was for fuel, repairs, oil and other operating costs for tractors and other machines.

Contrary to expectations, the target group had slightly higher costs for machine operations than did the non-target group. They owned slightly more (and older) machinery than the non-target group, even though they did not have a larger area of cropland and did not do more machine work than the non-target households. Thus, in a general way this difference in machinery costs can be attributed to less careful and less efficient operations and to some degree of over-investment in machinery.

#### Income and Farm Size

Because of the predominance of off-farm income, a larger farm size -- except in extreme cases -- was not a significant factor contributing to the overall income and well-being of rural farm households. By the same token a small acreage was not a serious deterrent.

Despite the relative unimportance of size of farm and farm income to the overall well-being of rural farm families, the area of land was a critical factor contributing to that portion of income derived from farming. And, as will be discussed later, the quality of this available land was also important. The households with the smallest farms, mainly those with less than 10 acres, had incomes from farm sources that were generally well below G\$600 per household (Table 3-20).

Table 3-20. Major Sources of Farm Household Total  
Income, by Size of Farm, 1978

| Size of farm<br>acres | Proportion of<br>households | Source of Net Income               |          |                | All<br>sources/<br>per capita |
|-----------------------|-----------------------------|------------------------------------|----------|----------------|-------------------------------|
|                       |                             | Farm                               | Off-farm | All<br>sources |                               |
|                       | ---Percent---               | ---Guyana dollars per household--- |          |                |                               |
| less than 2.5         | 25.4                        | 592                                | 3,135    | 3,727          | 573                           |
| 2.5 to 4.9            | 15.2                        | 470                                | 2,221    | 2,691          | 404                           |
| 5.0 to 9.9            | 19.9                        | 603                                | 2,178    | 2,780          | 413                           |
| 10.0 to 14.9          | 13.8                        | 868                                | 1,685    | 2,554          | 378                           |
| 15.0 to 24.9          | 14.6                        | 2,538                              | 1,653    | 4,191          | 587                           |
| 25.0 to 49.9          | 6.4                         | 1,855                              | 1,666    | 3,521          | 501                           |
| 50.0 and over         | 4.6                         | 5,014                              | 1,517    | 6,531          | 943                           |
| All Farms             | 100.0                       | 1,184                              | 2,220    | 3,403          | 504                           |

Source: Computer printout tables 165, 165A.

The households with larger farm acreages, those with more than 15 acres, had net incomes from farm sources of upwards of G\$1,800.

The correlation between net income from farming and farm size was, however, far from perfect over the full range of sizes. Within each size group there appeared to be numerous other factors, including type of farming, location, water control, management, operating efficiency and choice of enterprise, that apparently caused the net income from farm sources to deviate widely from each of the respective per-acre averages.

None of the seven size-of-farm groups, except the few that represented the largest farms (those with more than 50 acres of land), had average incomes from all sources that measured up to the U.S. development assistance goal of G\$600 per capita. Similarly, none but this size group measured up to the Guyana goal of G\$6,000 per farm household from all sources. The lowest average income -- G\$376 per capita -- was associated with households having mid-sized farms of 10 to 15 acres of land, not as had been expected by the analyst, with the smallest farms of less than 2.5 acres. It is postulated that these mid-size households may, for some reason, be in economic limbo. The size of their farming operation may be just large enough to keep much of the family labor occupied in farming rather than off the farm. However, the size may not be large enough to provide a sufficient income in years like 1978 when returns from farming were generally low.

It is important to note further that from farming alone, none of the size groups had average net incomes in 1978 that even approached the Guyana goal, and only the largest sizes had per capita incomes above the U.S. target level; that group averaged just over G\$700 per person.

As one might expect, the average gross sales from crops were strongly correlated with a larger land area (Table 3-21). This was in contrast to an almost total lack of any significant correlation between area of land and the marketings of livestock and livestock products. The "other" farm receipts (consisting primarily of rents, machinery hire and sales of a number of processed products) were, however, strongly correlated with the size of the farm operation.

In almost every size group, the farm products used in the home turned out to be a more important contributor to the average farm income than livestock sales. Roughly 60 percent of the value of home-used products was from milk, meat, eggs, and poultry. This varied little by size of farm

Table 3-21. Major Sources of Farm Receipts of Farm Households by Size of Farm, 1978

(Guyana dollars per household)

| Size of farm acres | Marketing of |           | Other farm receipts | Home use | Total farm receipts |
|--------------------|--------------|-----------|---------------------|----------|---------------------|
|                    | Crops        | Livestock |                     |          |                     |
| less than 2.5      | 290          | 627       | 30                  | 364      | 1,311               |
| 2.5 to 4.9         | 740          | 173       | 27                  | 353      | 1,293               |
| 5.0 to 9.9         | 1,471        | 243       | 72                  | 388      | 2,174               |
| 10.0 to 14.9       | 2,216        | 226       | 121                 | 427      | 2,990               |
| 15.0 to 24.9       | 5,855        | 459       | 102                 | 480      | 6,914               |
| 25.0 to 49.9       | 4,197        | 489       | 450                 | 661      | 5,801               |
| 50.0 or more       | 12,690       | 1,160     | 227                 | 717      | 14,794              |
| All Farms          | 2,501        | 417       | 97                  | 428      | 3,443               |

Source: Computer printout table 163.

except for the smallest size group where livestock products constituted nearly 70 percent of the home-used products.

The substantial degree of commercialization in all size groups is indicated by their dependence on purchased farm inputs (Table 3-22). As indicated previously, on the average about two-thirds of the farm receipts were used to pay for fertilizers, pesticides, machinery operations, livestock medicines, feed, seed and many other purchased production items. There were only modest deviations from this ratio among most of the different size-of-farm categories. Only the two smallest size groups seemed to be less dependent on commercial inputs than their larger neighbors.

Of special note is the group of households 15 to 25 acres in size. They stand out in terms of their unusually high net income from farming when compared to a value that might be expected from the net incomes of size groups above and below. This is because a high proportion of the sugar cane growers fell into this category. Cane farmers had higher-than-average farm expenses for their size groups, but they also reaped much higher-than-average returns from the sale of this crop, which proved to be one of the more lucrative sources of income for farmers.

#### Farm Household Incomes and Welfare in the National Context

In order to understand the policy and programmatic implications of the study of rural farm households, it is useful to consider these farm households in the context of the national income situation, the distribution of income and other aspects of welfare in Guyana.

Rural farm households constitute a special target group within the Guyana rural population. More than three-fourths of all Guyana households with incomes below the U.S. development assistance target level lived in rural areas in 1977 (Table 3-23).<sup>1</sup> This high proportion reflects both the

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1. Based on unpublished data from the 1977 Guyana Labour Force Survey. The U.S. target level for development assistance was taken as G\$500 household income per capita in 1977. The income tabulations used from the Labour Force Survey did not include the value of home consumption and unearned income. The use of the Labour Force Survey to obtain estimates of household income is discussed in the RRNA report, "Low Income Households in Guyana as Indicated by the 1977 Labour Force Survey," prepared for USAID, December 18, 1978, Appendix A.

Table 3-22. Major Items of Farm Expenses of Farm Households, By Size of Farm, 1978

(Guyana dollars per household)

| Size of farm, acres | Crop expenses | Livestock expenses | Interest payments | Other expenses | Total operating expenses |
|---------------------|---------------|--------------------|-------------------|----------------|--------------------------|
| less than 2.5       | 139           | 503                | 7                 | 70             | 718                      |
| 2.5 to 4.9          | 527           | 154                | 16                | 127            | 824                      |
| 5.0 to 9.9          | 1,059         | 181                | 51                | 286            | 1,576                    |
| 10.0 to 14.9        | 1,471         | 164                | 31                | 451            | 2,117                    |
| 15.0 to 24.9        | 3,112         | 303                | 81                | 873            | 4,370                    |
| 25.0 to 49.9        | 2,301         | 247                | 141               | 1,250          | 3,938                    |
| 50.0 and over       | <u>5,051</u>  | <u>426</u>         | <u>216</u>        | <u>4,078</u>   | <u>9,771</u>             |
| All farms           | 1,367         | 290                | 50                | 554            | 2,260                    |

Source: Computer printout table 163A.

Table 3-23. Guyana Households with Earned Income Per Capita less than \$500, Urban and Rural Areas and Region, 1977

(percent)

3-36.

| Area                   | Proportion of Guyana total households reporting | Proportion of Guyana total households with earned income per capita or \$500 or less | Proportion of household in the defined area with earned income per capita of \$500 or less |
|------------------------|---|--|--|
| Total Guyana           | 100.0   | 100.0  | 52.7   |
| Urban areas            | 28.7  | 21.4   | 39.3   |
| Georgetown and suburbs | 22.5  | 16.9   | 31.1   |
| New Amsterdam          | 2.6   | 2.7  | 55.8   |
| Linden District        | 3.6   | 1.8  | 26.0   |
| Rural areas            | 71.3  | 78.6   | 58.1   |
| Remote areas           | 2.0   | 1.7  | 45.1   |
| Essequibo              | 8.5   | 10.4   | 64.9   |
| West Demerara          | 13.5  | 12.4   | 48.1   |
| East Bank Demerara     | 4.9   | 4.7  | 50.6   |
| East Coast Demerara    | 17.3  | 18.1   | 55.3   |
| West Berbice           | 5.9   | 9.2  | 31.5   |
| East Berbice           | 19.2  | 22.1   | 60.5   |

Source: RRNA, "Low-Income Households in Guyana as indicated by the 1977 Labour Force Survey," Submitted to the AID, December 18, 1978, Table 2, from unpublished tabulations of Guyana Labour Force Survey, 1977.

predominantly rural orientation of the Guyana population and also the higher incidence in rural areas of households with low incomes.

In the rural areas, well over half the Guyana households had incomes below the U.S. development assistance target in 1977. This was also the case in the small city of New Amsterdam with its rural orientation. In contrast, in the Georgetown and Linden urban areas, less than one household in three fell within the target group. The concentration of low per capita household incomes was greatest in West Berbice, where four of five households had incomes below the AID target.

Within the rural population, households headed by a farmer were much more likely to fall into the target group than those headed by a person employed for wages:

| <u>Employment of Household Head</u>     | <u>Percent of Households<br/>with Per Capita Incomes<br/>Below AID 1977 Target</u> |
|---|--|
| Farmer, self-employed in<br>agriculture | 76   |
| Employed for wage in<br>agriculture     | 44   |

It is possible to identify other Guyana population groups which also have incomes below the U.S. development-assistance poverty guidelines, such as households with a head who is aged or out of the labor force. These households appear less likely than farm households in general to benefit from programs designed to increase incomes through improvements in productivity.

#### The Distribution of Income

Guyana farm households had a moderately skewed distribution of income in 1978. The two-thirds of the farm households with the lowest per capita incomes received approximately a quarter of the total income; the one-third of the farm households with the highest income received three-quarters (Table 3-24). This low proportion of total income accruing to the target group is caused in large part by the effect of the households with negative net income in 1978.

As indicated by the Gini Coefficient, a common measure of the inequality of the distribution of incomes, the distribution of the rural farm household incomes had a value of

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1. Ibid.

Table 3-24. Distribution of Income,  
Guyana, 1977-79

|   | Lowest two-thirds of<br>household according<br>to per capita house-<br>hold income | Gini<br>coefficient |
|---|--|---------------------|
| Guyana labor force survey, 1977                             |  |                     |
| All households  | 23   | .57                 |
| Urban households  | 11   | .77                 |
| Rural households  | 34   | .47                 |
| Guyana rural farm household<br>survey, 1978-79              |  |                     |
| All rural farm households,<br>1978                          | 26   | .59                 |
| All rural farm households<br>with positive incomes,<br>1978 | 45   | .46                 |

Source: Compiled by RRNA from data in surveys indicated.

0.59 for 1978. This indicates a more unequal distribution compared with previous estimates for Guyana and with the results from many other developing countries. In addition, the distribution of incomes in Guyana as a whole was more unequal than for rural farm households alone. This is because of the situation of urban areas, which have a considerably more uneven distribution than that found in the rural sectors.

#### Other Indicators of Welfare

The distribution of a number of factors associated with the welfare of the population has not been as unequal as the consideration of income factors alone would indicate. The distribution of land resources, of the necessities of life, and of food appears much more equal. These other indicators and measures reflect a long history of social and economic development in Guyana.

In comparison with the non-target group, the target farm households were not as disadvantaged in terms of land controlled as the 1978 differences in income would indicate. The two-thirds of the rural farm households in the target group controlled over half the rural farm acreage. This is a more equal distribution of land than is found in many developing countries. However, the control of the highest quality irrigated land may have been more concentrated in the higher-income households.

Most Guyanese in rural and urban areas appear to have access to the basic necessities of life as Government policies over the past decades have produced a widespread availability of potable water, hospitals, medicines, housing, primary and secondary education, food subsidies, etc. In terms of a "Physical Quality of Life Index," which measures infant mortality, life expectancy and literacy, Guyana ranks highest among countries with a similar per capita income. Of the 38 countries in the "lower-middle" income range in 1978, Guyana ranked first with Western Samoa with a Quality of Life Index of 84 on a scale of 100.<sup>1</sup>

A further indicator of welfare and of standard of living besides household income is household food consumption. The average consumption of basic food items by target farm households was similar to that of the non-target group in 1978.

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1. Martin M. McLaughlin and the Staff of the Overseas Development Council, The United States and World Development: Agenda 1979, Table A-4.

Compared with the non-target households, the target group generally had slightly higher per capita consumption of rice, similar consumption of ground provisions, dry beans and fish, and lower consumption of meat and poultry (Table 3-25). The average per capita consumption of meat, poultry and fish taken together for the target households was four-fifths that of the non-target households. The disadvantage in meat consumption of the target households may be somewhat offset by the higher proportion of children in these households.

The low-income farm households were almost able to equal the basic food consumption of the non-target group by using a higher proportion of the produce from their own farms. These households consumed an average of about 10 percent of the value of their harvested crops and a full 50 percent of the value of their livestock products and slaughtered livestock, proportions approximately double the ratios for the non-target households (Table 3-26). In addition, the low-income households caught about 20 percent of their own fish, again twice the non-target group ratio.

The per capita rice consumption of the target farm households, 213 pounds in 1978, is higher than the various estimates of per capita consumption for Guyana as a whole in 1977 -- from 175 to 192 pounds. The Guyana average, in turn, is the second highest in the Western hemisphere, behind neighboring Surinam.<sup>1</sup> The reported per capita averages of meat and fish for the target group were much higher than the 78 pounds per capita supplies of these items indicated in the 1971 National Food and Nutrition Survey of Guyana.<sup>2</sup>

Among the different strata of household per capita incomes within the target group, there were also similar levels of food consumption of starches, beans, meat, and fish. These averages indicate a rather even distribution within the target group as well. Of course, individual households will deviate from the average. Nevertheless, the basic equality of the food distribution among farm households should be considered in the interpretation of the data on income and income distribution.

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1. Reported by Checchi and Company, Rice II: Second Guyana Rice Modernization Project Feasibility Study and Report, prepared for USAID, March 1979, Exhibits C.5c and C.7, pp. C-20 and C-33.

2. Pan American Health Organization, The National Food and Nutrition Survey of Guyana, Scientific Publication No. 323, 1976, Table 28, pp. 66-69.

Table 3-25. One Weeks' Food Consumption, Target and  
Non-target Farm Households, 1979

|                                  | Target<br>households | Non-target<br>households | All<br>households |
|----------------------------------|----------------------|--------------------------|-------------------|
| Per household                    |                      |                          |                   |
| Rice (pints)                     | 28.6                 | 23.5                     | 26.9              |
| Ground provisions<br>(pounds)    | 13.5                 | 13.2                     | 13.4              |
| Dry beans, peas, nuts<br>(pints) | 3.5                  | 3.0                      | 3.3               |
| Meat and poultry<br>(pounds)     | 7.9                  | 9.1                      | 8.3               |
| Fish                             | 10.5                 | 10.0                     | 10.4              |
| Per Capita                       |                      |                          |                   |
| Rice (pints)                     | 4.1                  | 3.7                      | 4.0               |
| Ground provisions<br>(pounds)    | 1.9                  | 2.1                      | 2.0               |
| Dry beans, peas, nuts<br>(pints) | 0.5                  | 0.5                      | 0.5               |
| Meat and poultry<br>(pounds)     | 1.1                  | 1.4                      | 1.2               |
| Fish                             | 1.5                  | 1.6                      | 1.5               |

Source: Computer printout tables 260, 260A, 350.

Table 3-26. Annual Home Provision of Food,  
Target and Non-target Farm Households,  
1978

|   | Target<br>households | Non-target<br>households | All<br>households |
|---|----------------------|--------------------------|-------------------|
| -----Guyana dollars-----                |                      |                          |                   |
| Home-used produce<br>value per capita   |                      |                          |                   |
| Total                                   | 56                   | 81                       | 63                |
| Crops                                   | 25                   | 32                       | 27                |
| Livestock                               | 31                   | 49                       | 36                |
| -----proportion-----                    |                      |                          |                   |
| Proportion of gross<br>receipts         |                      |                          |                   |
| Total                                   | 18                   | 9                        | 13                |
| Crops                                   | 10                   | 4                        | 7                 |
| Livestock                               | 50                   | 27                       | 37                |
| -----pounds-----                        |                      |                          |                   |
| Home-caught fish                        |                      |                          |                   |
| Amount per capita <sup>a</sup>          | 15                   | 7                        | 12                |
| Proportion of total<br>fish consumption | 17                   | 9                        | 15                |

a. Reported weekly consumption on annualized basis.

Source: Text table 3-15; Computer printout tables 350, 350A.

#### CHAPTER 4. THE LAND AND CAPITAL RESOURCE BASE FOR FARMING

In early 1979, the average rural farm household in Guyana commanded about G\$14,000 worth of capital in land, machinery, and livestock to generate the one third of its 1978 net income that came from its own farming operations. The non-target group commanded about G\$20,000 of such resources, while the target households controlled only about G\$10,500 per farm.

The availability and use of land appear to be only a moderately important factor distinguishing the farm households that constituted the target groups from those that were more efficient. Yet the quality of that land, especially with respect to water control, appeared important to the efficiency of crop production and the success of farming in Guyana.

Most farms relied on power-drawn machinery for land preparation and for the harvesting of rice crops, but the ownership of such machinery was not widespread. Rather, most households relied on rental or hire of such equipment.

Livestock accounted for almost one fifth of the capital value of farm households.

##### The Capital Structure of Farms

The trend toward modernization and commercialization of Guyana agriculture brings with it the need to accumulate and control substantially larger amounts of capital than were required some 25 years ago. At that time, the average owned investment in farm machinery, land, and livestock was estimated to be about G\$2,500 per farm -- mostly in land and livestock.<sup>1</sup> There was very little machinery of any kind with the exception of that used by a few early innovators and by the Department of Agriculture in the experiments at

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1. O.P. Blaich, Agriculture in Guiana, Census 1952, Volume 1, No. 1.

4-2.

MARDS. In early 1979, the comparable total owned investment -- omitting rented land -- amounted to almost G\$10,000 per farm household (Table 4-1).

Table 4-1. Farm Capital Per Household, Target and Non-target Farm Households, 1978

(Guyana dollars)

|                                   | Target households | Non-target households | All households |
|-----------------------------------|-------------------|-----------------------|----------------|
| Land owned <sup>a</sup>           | 3,255             | 8,500                 | 5,050          |
| Machinery owned <sup>b</sup>      | 2,490             | 3,815                 | 2,990          |
| Livestock owned <sup>c</sup>      | 1,620             | 2,300                 | 1,845          |
| Total owned capital               | 7,365             | 14,615                | 9,885          |
| Value of rented land <sup>a</sup> | 3,175             | 5,740                 | 4,135          |
| Total capital                     | 10,540            | 20,355                | 14,020         |

a. Assumes average value per acre paid for land by households in the respective groups in the 1974-78 period.

b. Assumes current value.

c. Assumes average value of sales and purchases for each class of livestock and poultry.

Source: Computer printout tables 190, 213, 218, 220, 222, 225, 226, 226D, 228; tabulations of October 5, 1979.

Inflation has, of course, been a major contributor to expanding the value of farm assets since 1952. Nonetheless, the average size of farms in terms of cropland was larger by roughly 1.6 acres at the time of the 1978 survey, and many more farmers now have tractors, motorcars and other sophisticated modern equipment, some of which was not even known to most Guyanese farmers at that time.

Just over one-half of the average investment supporting the farming operations of rural farm households was in the value of farmland in 1978. This compares with nearly 82 percent in 1952. In addition, about 30 percent of the farm-related inventory is in machinery and 20 percent is in livestock and poultry. In 1952 these proportions were 4 percent for machinery and tools and 17 percent -- nearly the same -- for livestock and poultry.

The distribution of farm machinery for the non-target group was not much different from the average although it was skewed somewhat more toward a greater investment in land than was the case for the target group. The non-target group owned twice as much land as did its lower income neighbors and had a moderately higher land value per acre, apparently due to better drainage and better access to irrigation water.

In addition to its own capital, the average farm household rents considerable land and hires considerable machinery. The value of the rented land, if it is of average quality, is estimated to be about G\$4,100 per household. This is equivalent to an addition of about 40 percent to the capital structure of the average operating farm. Furthermore, the average farm household, both target and non-target, paid about G\$400 for the hire of tractors, combines, and other farm equipment used mainly for planting and harvesting rice. This suggests that farmers were paying for the use of a substantial amount of additional capital through hire.

The total amount of capital used was clearly related to the size of the farm. Those with more than 50 acres, the only size group to achieve the U.S. foreign-assistance income target for Guyana from farming alone, had control through ownership and rental of nearly G\$80,000 of capital in land, machinery and livestock (Table 4-2).

Close to 60 percent of the capital used by these large operators was in the value of the land and 25 percent was for machinery and equipment. The remaining 15 percent was in the value of livestock --mostly cattle. By contrast, the smallest producers controlled less than G\$3,500 of farm capital; well over half of this was in livestock, about 25 percent in machinery, and only 20 percent in land.

#### Land Values

During that five-year period before the survey, the current farm households acquired less than seven percent of the land they owned -- an average of less than 1.5 percent per year. The average price paid for the land varied considerably from area to area, from farm to farm and from year to year (Table 4-3).

Since so little land changed hands each year, the average value in any one year was influenced considerably by the extremes of a few individual cases. However, in 1978 almost all sales appeared to be 30 to 50 percent below the price

Table 4-2. Average Capital Controlled for Farming,  
By Farm Size of Farm Households, 1979

(Guyana dollars per household)

| Size of farm,<br>acres     | Owned and<br>rented land <sup>a</sup> | Livestock and<br>poultry on hand <sup>b</sup> | Machines and<br>equipment | Total<br>inventory |
|----------------------------|---------------------------------------|---|---------------------------|--------------------|
| less than 2.5              | 698                                   | 1,874   | 896                       | 3,468              |
| 2.5 to 4.9                 | 2,037                                 | 1,689   | 583                       | 4,309              |
| 5.0 to 9.9                 | 3,900                                 | 2,208   | 1,735                     | 7,843              |
| 10.0 to 14.9               | 6,576                                 | 2,079   | 2,310                     | 10,965             |
| 15.0 to 24.9               | 10,302                                | 1,991   | 4,170                     | 16,463             |
| 25.0 to 49.9               | 19,264                                | 3,051   | 7,382                     | 29,697             |
| 50.0 and over <sup>a</sup> | 46,648                                | 12,671  | 19,989                    | 79,308             |
| All Farms                  | 9,185                                 | 1,845   | 2,990                     | 14,020             |

a. Includes all owned and rented land valued at the Guyana average of G\$582 per acre for sales in 1975-78 except for the largest size group which is valued at half that amount because of the presence of a large portion of pasture and unused land.

b. Current inventories valued at the same purchased and sales price for each of the respective classes.

c. Machinery reported at current market value.

Source: Computer printout tables 100, 123-134, 136-136D, 138; tabulations of October 5, 1979.

Table 4-3. Land Purchases, Target and Non-target Farm Households, 1974-78

| Year of purchase  | Price Paid                        |                       |                | Total acres purchased |
|-------------------|-----------------------------------|-----------------------|----------------|-----------------------|
|                   | Target households                 | Non-target households | All households |                       |
|                   | -----Guyana dollars per acre----- |                       |                | ----Number----        |
| 1974              | 967                               | 523                   | 757            | 1,459                 |
| 1975              | 527                               | 555                   | 536            | 2,377                 |
| 1976              | 487                               | 995                   | 550            | 1,922                 |
| 1977              | 343                               | 859                   | 811            | 3,572                 |
| 1978              | <u>245</u>                        | <u>271</u>            | <u>259</u>     | <u>4,606</u>          |
| Five year average | 514                               | 641                   | 583            | 13,936                |

Source: Computer printout Table 228.

levels reported in 1977 and earlier years. The reason for this unusual fall in average land values is not clear.<sup>1</sup>

#### Farm Machinery Investment

With the exception of minor farm tools, which nearly every farm household had, there were comparatively few farms that owned a significant amount of power machinery and equipment (Table 4-4). On the average, fewer than 12 percent of the households had tractors and the necessary pull-type equipment for planting and cultivating. These tended to be concentrated to some degree on farms with larger acres.

It is notable, however, that many of the tractors were owned by low income households who use them not only for their own farm operations but also for custom hire on farms that do not have any, or on farms that need additional help. In fact, a slightly higher proportion of the target group had tractors and pull-type equipment.

1. In most circumstances a change in land values of this magnitude would be considered a serious problem. However, in this case it could represent a statistical aberration due to the small size of the sample of farmers who had experienced land purchases or sales. The matter should be investigated before actions are based on the finding.

2. Computer printout tables 136 A through D.

Table 4-4. Motor Cars, Farm Machinery and Equipment  
Target and Non-Target Farm Households, 1979

| Item                                | Target households |                             | Non-target households |                             | All households   |                             |             |
|-------------------------------------|-------------------|-----------------------------|-----------------------|-----------------------------|------------------|-----------------------------|-------------|
|                                     | Number reporting  | Value per farm <sup>a</sup> | Number reporting      | Value per farm <sup>a</sup> | Number reporting | Value per farm <sup>a</sup> | Average Age |
|                                     | Percent           | Guyana dollars              | Percent               | Guyana dollars              | Percent          | Guyana dollars              | Years       |
| Motorcar                            | 4.8               | 7,400                       | 8.6                   | 10,500                      | 6.0              | 8,890                       | 5.5         |
| <u>Farm machinery and Equipment</u> |                   |                             |                       |                             |                  |                             |             |
| Truck, lorries                      | 2.1               | 14,010                      | 3.5                   | 12,200                      | 2.7              | 13,720                      | 5.3         |
| Tractors                            | 12.7              | 8,640                       | 9.6                   | 13,720                      | 11.7             | 10,900                      | 9.9         |
| Combines                            | .7                | 28,440                      | 1.5                   | 22,020                      | 1.0              | 24,990                      | 12.8        |
| Plows, cultivators                  | 11.6              | 1,790                       | 8.2                   | 2,620                       | 10.5             | 2,010                       | 9.5         |
| Irrigation Pumps                    | 3.0               | 1,350                       | 4.4                   | 2,290                       | 3.5              | 1,740                       | 7.4         |
| Bulldozers, Draglines               | .4                | 8,030                       | 1.4                   | 10,490                      | .7               | 10,000                      | 5.0         |
| Boats                               | 14.9              | 1,250                       | 9.8                   | 2,040                       | 13.2             | 1,440                       | 4.9         |
| Minor equipment                     | .9                | 1,760                       | 2.5                   | 1,740                       | 1.4              | 1,740                       | -           |
| Tools                               | 87.0              | 90                          | 89.5                  | 140                         | 87.8             | 110                         | -           |
| Total <sup>b</sup>                  | 100.0             | 2,152                       | 100.0                 | 3,768                       | 100.0            | 2,990                       | -           |

a. Average value for households reporting the item except total machinery and equipment for all farms.

b. Motor cars are included for information, but are not included in totals of farm machinery.

Source: Computer printout tables 226, 226-A through D.

Only about one farm household in 100 had a combine for harvesting rice in 1979. Those farmers who did not have one usually hired one from other farmers, from the Guyana Rice Board, or from machinery cooperatives, a few of which were reported to be in existence. Less than 3 percent of households had a truck. In addition, 6 percent of the households had a car. For many this was more than a mode of personal transportation. In fact, about 28 percent of the car owners reported using their cars as taxis to earn additional family income. Although cars were not included in the calculation of farm machinery capital stock, undoubtedly farmer car owners depended on their cars to haul much of their own or their neighbors' produce to market and to bring back farm and household supplies.

Boats were also reported as an important part of farm transportation. About 13 percent of the households reported owning at least one. As expected, there is a heavy concentration of boats in the riverine areas where there are few or no roads. However, farmers in the coastal areas also used boats extensively on the irrigation canals to haul produce from their fields to their houselots. From there they took them to market by car, truck, tractor and trailer, bicycle or public conveyance.

These low figures regarding the ownership of machinery do not contradict the extent of farm mechanization in Guyana, particularly in rice production. It simply indicates that many producers depended on machinery owned by others for the main planting and harvesting operations. This system for distributing machinery services undoubtedly helps avoid an over-investment in machinery by farms too small to use tractors and such machinery in a full and efficient way by themselves. At the same time, the system cannot be conducive to optimum timing of farm operations nor to obtaining the best yields for all farmers. One of the major complaints of rice producers, most of whom did not own tractors, trucks or combines is that such machines were not always available for them at the critical times of planting and harvesting.

Because of severe import restrictions on machinery in recent years, the average farm machine in Guyana has aged considerably. For both income groups, trucks average from four to six years of age. Tractors and combines were reported owned for an average of 8 to 12 years with some reported as old as 15 years.

Stretching the life of machinery can contribute to holding down transportation demand, but the cost of maintaining power equipment to such extreme ages tends to be

very high. Perhaps equally important is that such machines are undependable and break down frequently at critical times during planting and harvesting, contributing further to higher costs and lower yields. Nonetheless, farmers have been forced by circumstance to keep their machines running despite the high costs and problems in getting repair parts.

The extreme scarcity of farm machinery in Guyana has been reflected in the marketplace. In many cases, farmers estimated that the appreciated market value of the machines they owned during 1978 was enough to offset the depreciation and wear and tear of that year.

About seven percent of the farm households reported buying one or more pieces of machinery in 1978.<sup>1</sup> This was mostly used equipment, since new machinery is not widely available. A slightly smaller proportion -- nearly six percent -- had also purchased machinery in 1977. For the most part farmers felt that the value of the machines purchased in 1977 had increased since that time. The average gain was estimated to be about 14 percent which, when added to the depreciation that all machines must eventually bear, suggests a market inflation factor approaching 25 to 30 percent in 1978.

#### Livestock Investments

The average farm household in rural Guyana had nearly 20 percent of its investment in livestock. However, this understates the case for those households which concentrated on raising livestock. Less than 30 percent of the households had cattle, only 20 percent had sheep or goats and just over 10 percent had pigs (Table 4-5). Ownership of chickens and other poultry was widespread, but the basic investment in birds per farm was small. The 77 percent that owned chickens reported an average investment of only G\$77 per farm household. The 42 percent with ducks, geese, and turkeys averaged G\$116 investment per farm.

Those in the target group who kept livestock had relatively heavy investments in cattle, sheep, goats, and pigs. In all, the proportion of total capital accounted for by livestock was somewhat higher in the target group than in the non-target households.

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1. Computer printout table 227.

Table 4-5. <sup>a</sup> Estimated Value of Livestock and Poultry Inventories, <sup>a</sup> Target and Non-Target Farm Households, 1979

|                          | Target households            |                                | Non-target households        |                                | All households               |                                |
|--------------------------|------------------------------|--------------------------------|------------------------------|--------------------------------|------------------------------|--------------------------------|
|                          | Pro-<br>portion<br>Reporting | Value <sup>b</sup> per<br>farm | Pro-<br>portion<br>Reporting | Value per<br>farm <sup>b</sup> | Pro-<br>portion<br>Reporting | Value per<br>farm <sup>b</sup> |
|                          | Percent                      | Guyana<br>dollars              | Percent                      | Guyana<br>dollars              | Percent                      | Guyana<br>dollars              |
| Cattle                   | 28                           | 4,687                          | 29                           | 6,199                          | 28                           | 5,200                          |
| Sheep & goats            | 19                           | 639                            | 16                           | 1,034                          | 18                           | 758                            |
| Pigs                     | 10                           | 228                            | 15                           | 2,938                          | 11                           | 996                            |
| Chickens                 | 78                           | 47                             | 73                           | 125                            | 77                           | 77                             |
| Geese, ducks,<br>turkeys | 42                           | 110                            | 41                           | 127                            | 42                           | 116                            |
| Donkeys, horses          | 8                            | 891                            | 7                            | 986                            | 8                            | 921                            |

a. Value determined on basis of average price of sales in 1978.

b. Average value for households reporting the item.  
Source: Computer printout tables 213, 216, 218, 220, 222, 225.

### Capital Maintenance

The capital base for the farming operations of rural households is not maintained without cost. There are interest costs on loans that had been obtained to acquire the capital; machinery has to be replaced when it becomes inefficient or uneconomical to use; land and buildings have to be maintained or improved; and new breeding stock needs to be purchased.

The average cost for all capital maintenance by total farm households in 1978 was G\$657 (Table 4-6). This was roughly five percent of the total farm investment. The capital maintenance costs for the target group were slightly higher as a proportion of capital than for the non-target households. These capital expenses of the target farmers were more than a quarter of cash receipts and were much greater than net income. Thus, it appears that the target households generally attempted to maintain their capital,

Table 4-6. Capital Maintenance Costs, per Farm Household,  
Target and Non-target households, 1978

(Guyana dollars)

| Item                               | Target households | Non-target households | All households |
|------------------------------------|-------------------|-----------------------|----------------|
|                                    | Guyana dollars    | Guyana dollars        | Guyana dollars |
| Interest paid                      | 70                | 71                    | 71             |
| Machinery purchased <sup>a</sup>   | 175               | 378                   | 243            |
| Livestock purchased <sup>b</sup>   | 85                | 150                   | 127            |
| Land purchased <sup>b</sup>        | 33                | 80                    | 48             |
| Building improvements <sup>b</sup> | 43                | 77                    | 55             |
| Land improvements                  | <u>101</u>        | <u>141</u>            | <u>114</u>     |
| Total                              | 508               | 898                   | 657            |

a. Machinery reported at current market value.

b. Current inventories valued at the same purchase and sales price for each of the respective classes.

Source: Computer printout tables 100, 123-134, 136-136D, 138; tabulations of October 5, 1979.

but they did so at relatively high cost in relation to the economic resources available to them.

In all cases most of the capital maintenance costs were for machinery purchases and replacements. That is usually the way in which farmers cover depreciation: machines are replaced when farmers have the money and when machines are available, even if they are acquired second-hand.

Very few of the farmers in the survey reported borrowing as a significant means of acquiring capital or for making capital improvements. Thus the average amount borrowed by farmers was about G\$115, with half going to purchase land and to make real estate improvements and the balance for machinery. However, this is deceiving. The few who reported having borrowed money for land and building improvements indicated average loans of G\$6,200, and those who reported getting machinery loans averaged over G\$6,600 per loan. The repayment period for most of these loans ranged from one to three years.

#### Investment in Land Improvements

Despite a high degree of uniformity in the use of purchased inputs, the non-target households had one expenditure item which was considerably higher for these more successful farmers -- land improvements. Only 17 percent of the target rice farmers made such improvements in 1978, but 31 percent of the non-target rice farmers did so (Table 4-7). This difference is equivalent to the target households making land improvements only once every six years, as compared to one every three for the non-target households. A similar relationship to target group status and expenditures for land improvements existed for foodcrop farms, but not for mixed farms.

#### Land Tenure and Use

In total, one-third of the non-target income households controlled less than one-half of the privately occupied farmland in Guyana. As was indicated previously, this skewedness in the distribution is not nearly as severe as is encountered in many other countries.

#### Land Availability

Because of the high level of dependence on off-farm sources of income, the availability of land proved not to be closely associated with the level of household income.



Table 4-8. Average Area of Land Available per Household  
By Region, Target and Non-target Farm Households, 1979  
(acres)

| Region                      | Target households | Non-target households | All households |
|-----------------------------|-------------------|-----------------------|----------------|
| Guyana                      | 13.0              | 21.7                  | 15.9           |
| Northwest-Pomeroon          | 17.3              | 28.9                  | 19.8           |
| Essequibo Coast and Islands | 10.4              | 14.0                  | 11.6           |
| West Demerara               | 9.0               | 12.9                  | 10.8           |
| East Demerara               | 12.1              | 18.8                  | 15.3           |
| West Berbice                | 26.7              | 20.1                  | 24.2           |
| East Berbice                | 12.0              | 40.4                  | 18.3           |

Source: Computer printout table 192.

Land availability in East Berbice was also different from the national picture. There, the relationship was consistent with rest of the country, but it was greatly exaggerated. The high income households there controlled more than three times as much land as did the target group, even though the latter still averaged 12 acres per household.

The fact that the amount of land was not a critical factor affecting per capita income is substantiated further by the similarity of the distribution of the size of land holdings within each of the income groups. Each group included relatively similar proportions of small, medium and above average-sized farms (Table 4-9).

#### Land Tenure

In Guyana it seems that if tenure security is a problem, it must be the exception rather than the rule. The average farm household owned just over one half of its land by freehold, grant, or transport (Table 4-10), all of which are traditionally secure means of holding land under English common law. An additional one-third of the land was held under long-term leases that exceeded 21 years. Consequently, only about 13 percent of the land held by coastal farm households was held on short-term leases or by other temporary means.

Table 4-9. Distribution of Farm Size  
 Target and Non-target Farm Households, 1979  
 (percent of households in income)

| Size of<br>farm in acres | Target<br>households | Non-target<br>households | All<br>households |
|--------------------------|----------------------|--------------------------|-------------------|
| less than 2.5            | 23.5                 | 28.6                     | 25.1              |
| 2.5 - 9.9                | 38.3                 | 29.5                     | 35.3              |
| 10.0 - 24.9              | 27.7                 | 29.9                     | 28.4              |
| 25.0 - 49.9              | 6.7                  | 6.0                      | 6.5               |
| 50.0 and over            | <u>3.9</u>           | <u>6.0</u>               | <u>4.7</u>        |
| Total                    | 100                  | 100                      | 100               |

Source: Computer printout table 191.

Table 4-10. Acreage per Household by Types of Land Tenure, Target and Non-target Farm Households, 1979

| Tenure                                       | Target households |                      | Non-target households |                      | All households |                      |
|--|-------------------|----------------------|-----------------------|----------------------|----------------|----------------------|
|  | Acres             | Percent <sup>a</sup> | Acres                 | Percent <sup>a</sup> | Acres          | Percent <sup>a</sup> |
| Total land controlled                        | 13.3              | 102.3                | 22.9                  | 105.2                | 16.5           | 103.6                |
| Owned  | 6.3               | 47.7                 | 13.3                  | 57.9                 | 8.7            | 52.5                 |
| Long-term leases                             | 4.7               | 35.0                 | 7.4                   | 32.4                 | 5.6            | 33.7                 |
| Short-term leases                            | 1.5               | 11.6                 | 1.5                   | 6.7                  | 1.5            | 9.3                  |
| Other tenancies                              | .8                | 5.7                  | .7                    | 3.0                  | .7             | 4.5                  |
| Land Rented out to others <sup>b</sup>       | .3                | 2.3                  | 1.2                   | 5.2                  | .6             | 3.6                  |
| Net land operated by households <sup>a</sup> | 13.0              | 100.0                | 21.7                  | 100.0                | 15.9           | 100.0                |

a. Percent of total land operated.

b. Land controlled minus land rented out to others.

Source: Computer printout table 190.

The tenure patterns for the target and non-target households differed from the average only slightly. Each group held about one-third of its land under long-term lease. However, the target group held only 47 percent of its land as owners, while the comparable number for the non-target household was 58 percent.

Regionally there were no important differences, with the minor exception of West Berbice where less than three quarters of the land available to farm households was held under ownership or long-term lease. Within this region, however, there was no noticeable difference in tenure patterns between the two income classes.

#### Land Use

An important finding regarding land use is that there was no important difference in the average amount of riceland held by the respective income groups. Considering the substantial developmental emphasis that has been placed on rice over the years and its dominance in the farming economy, one might expect that rice production would rate a relatively more important, if not dominant, role among the higher income households. This was not so, despite the substantially larger total area of land held on the average by the non-target households (Table 4-11). Of course, the averages provide only the general picture. Considerably more than half the target group had riceland, but only about two-fifths of the non-target group did. For the farms actually producing rice, the acreage of the non-target producers was almost double that of the target group. This is not an overwhelming difference, but it is nevertheless significant, as is indicated in the following chapter's discussion of efficiency in rice production.

Table 4-11. Acreage Per Household by Use of Land in Farms, Target and Non-Target groups, 1979

| Use of land    | Target group |         | Non-target group |         | All households |         |
|----------------|--------------|---------|------------------|---------|----------------|---------|
|                | Acres        | Percent | Acres            | Percent | Acres          | Percent |
| Land in farms  | 13.0         | 100     | 21.7             | 100     | 15.9           | 100     |
| Riceland       | 5.3          | 40.6    | 5.9              | 27.2    | 5.5            | 34.7    |
| Other cropland | 2.7          | 20.8    | 5.1              | 23.7    | 3.5            | 22.1    |
| Grazing land   | 1.6          | 12.1    | 3.6              | 16.6    | 2.2            | 14.1    |
| House lot      | 0.3          | 2.6     | .3               | 1.6     | 0.4            | 2.2     |
| Unused land    | 3.1          | 23.8    | 6.7              | 30.9    | 4.3            | 27.0    |

Source: Computer printout table 192.

A major difference in the averages of the target group, however, was in the amount of land normally devoted to foodcrops.<sup>1</sup> There were also important differences in the amount of grazing land and unused land each group possessed. In each of these three land-use categories, the average area was roughly twice as large for the non-target group as it was for the target group. This accounted for its larger size of land holdings.

In Guyana, differences in land use are associated primarily with regional differences. As is well known, foodcrop production dominates the Northwest and Pomeroon area as well as parts of East and West Demerara. On the other hand, rice production dominates the Essequibo Coast, the Islands and most of Berbice. Although there are significant income differences between regions, there does not seem to be a consistent pattern attributable to the type of farming carried on in them. For example, the Northwest-Pomeroon, which is a foodcrop area, and East Berbice, which is largely a rice area, each had about 78 percent of the households with incomes below the G\$600 per capita target level. In Demerara, where foodcrops dominate, the comparable figure was 55 percent while in Essequibo and West Berbice, where rice was supreme, some 60-70 percent of the households fell into the target group.

#### Water Control

Water control seems to be the dominant factor associated with the well-being of Guyanese rural farm households (Table 4-12). Farmers were asked to evaluate their cropland in this regard. The target groups judged that substantially more of their cropland was poorly drained than was that of the non-target groups. In addition, their land suffered from a much higher incidence of insufficient water for irrigating crops. In effect the latter depended considerably more on the natural elements for water and drainage.

The quality of water control varied considerably in the different regions, but the strong pattern of difference between target and non-target groups persisted in every area. As a rule, the problem of insufficient water was of greater concern than was the lack of drainage. Of exceptional note was the poor state of water control in the West Berbice area -- appropriately designated as the highest priority area for improvement as part of the Mahaica-Mahaicony-Abary development project.

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1. Foodcrop is a term that has been applied to crops other than rice and estate-grown sugar cane.

Table 4-12. Regional Difference in the Quality of Water Control on Cropland, By Region, Target and Non-target Farm Households, 1979  
(percent of cropland of income status group)

| Region and water control            | Target households | Non-target households | All households |
|-------------------------------------|-------------------|-----------------------|----------------|
| -----percent of total cropland----- |                   |                       |                |
| Guyana                              |                   |                       |                |
| Poorly drained                      | 41                | 29                    | 36             |
| Insufficient water                  | 60                | 41                    | 53             |
| Northwest-Pomeroon                  |                   |                       |                |
| Poorly drained                      | 24                | 6                     | 17             |
| Insufficient water                  | 22                | 11                    | 18             |
| Essequibo Coast and Island          |                   |                       |                |
| Poorly drained                      | 35                | 25                    | 31             |
| Insufficient water                  | 71                | 41                    | 60             |
| West Demerara                       |                   |                       |                |
| Poorly drained                      | 27                | 15                    | 19             |
| Insufficient water                  | 43                | 18                    | 27             |
| East Demerara                       |                   |                       |                |
| Poorly drained                      | 41                | 32                    | 35             |
| Insufficient water                  | 48                | 40                    | 44             |
| West Berbice                        |                   |                       |                |
| Poorly drained                      | 71                | 59                    | 66             |
| Insufficient water                  | 76                | 70                    | 74             |
| East Berbice                        |                   |                       |                |
| Poorly drained                      | 38                | 31                    | 37             |
| Insufficient water                  | 67                | 55                    | 64             |

Source: Computer printout Table 195.

### Unused Land and Grazing Land

The 1974 Foodcrop Sector Study raised a major question about the existence of a considerable amount of unused land and unproductive grazing lands on many farms in the coastal areas.<sup>1</sup> It was suggested in that study that greater emphasis be given to improving these lands, especially through on-site improvements, rather than placing the primary thrust for agricultural expansion on new lands in the interior. This study supports this thesis.

As reported at the time of the interview in early 1979, the coastal area as a whole averaged about 6.5 acres of low-producing land per farm household -- one-third was in rough unimproved pasture; the rest was unused. There was a strong tendency for more of these lands to be on the higher income non-target farms -- 10.3 acres as opposed to only 4.7 acres for the target groups (Table 4-13). This represented 47 and 36 percent of their respective total land area.

The geographic distribution of unused and grazing land in farms was not uniform throughout Guyana. It varied considerably from region to region. In East Berbice the difference between the two income groups was the most extreme --the target group averaged only 3.5 acres of grazing and unused land per household compared to an average of more than 30 acres in the non-target group. This represents, in part, a statistical aberration resulting from the inclusion in the survey sample of some extraordinarily large cattle ranches in that area. The opposite pattern was observed in West Demerara and in West Berbice. In each of these areas the target households had more low productive land than the non-target ones.

About 15 percent of farm households within the target group and 4 percent of the non-target group reported having some grazing land. In the survey responses, the most frequently reported reasons for not using this land for crops were that it was poorly drained, the soil was poor, and there was not enough water. Many respondents summed up the reasons by simply stating that the land was "too expensive" to improve. The context within which these cost judgments were made is not completely clear. It is not certain whether farmers felt that current farm prices would not justify the cost of making improvements or whether the households were unable to acquire sufficient low-cost capital for making the improvements. Whatever the reason, the farmers did not seem prepared to make the needed improvements on their own.

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1. RRNA, Guyana's Foodcrop Systems.

Table 4-13. Grazing Land and Unused Land by Region,  
Target and Non-target Farm Households, 1979

| Item  | Target<br>households | Non-target<br>households | All<br>households |
|---|----------------------|--------------------------|-------------------|
|   | -----percent-----    |                          |                   |
| Households reporting                              |                      |                          |                   |
| Grazing land                                      | 7                    | 9                        | 8                 |
| Unused land                                       | 22                   | 21                       | 22                |
|   | -----acres-----      |                          |                   |
| Total grazing and<br>unused land per<br>household |                      |                          |                   |
| Guyana  | 4.7                  | 10.3                     | 6.5               |
| Northwest-Pomeroon                                | 7.8                  | 10.0                     | 8.3               |
| Essequibo   | 2.9                  | 3.8                      | 3.1               |
| West Demerara                                     | 3.3                  | 1.5                      | 2.5               |
| East Demerara                                     | 5.3                  | 8.1                      | 6.6               |
| West Berbice                                      | 11.2                 | 4.6                      | 8.6               |
| East Berbice                                      | 3.5                  | 30.9                     | 9.6               |

Source: Computer printout table 192.

Unused land was reported by 44 percent of the target group and about 10 percent of the non-target households. Poor drainage and lack of water were again the most frequent reasons for not improving the land. Only about 12 percent of those who responded suggested that the soil was poor or saline. And whatever interpretation one might give to the term "too expensive," a high proportion -- about two-fifths of the households with unused land -- reported this as a major reason for not making such land productive.

### Farm Fragmentation

In many developing countries the fragmentation of land has been a major barrier to mechanization. In Guyana this has not been a deterrent. Much of the mechanized rice cultivation has taken place in newly developed areas where fields are large and machine cultivation and combine harvesting could be practiced. However, even in the more traditional areas where the fields are smaller there has been a complete shift to mechanized methods.

Mechanization has forced some, but not extensive, consolidation of farm lands in the last 25 years. In 1952 it was reported that the average Guyana farm had 2.3 parcels of land.<sup>1</sup> The current survey suggests that this average has now been reduced to about 2.0 blocks per household (Table 4-14). No appreciable differences were noted in the distribution of the number of blocks of land held by the target and non-target groups.

### The Use of Cropland

Guyana farm households produce a wide variety of crops in addition to rice. These include sugar cane, coconuts, palm oil, cassava, eddoes, plantain, bananas, citrus, coffee, pineapples, blackeyed peas, cabbage, tomatoes, corn and a host of lesser crops.<sup>2</sup> The variety of fruits, vegetables and provisions is abundant.

There were only a few significant differences in the cropping patterns between the two income groups (Table 4-15). As indicated earlier each had about the same average acreage of riceland available, but the non-target group had

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1. Blaich, Op. Cit.

2. Since this study pertains to Guyana farm households it includes only the sugar cane and other crops produced by them. As such it excludes the vast areas of sugar cane and some minor crops produced by Guyana Sugar Corporation known locally as GUYSUCO.

Table 4-14. Number of Blocks of Land Per Farm,  
1952 and 1978, Target and Non-target Farm Households, 1978  
(percent of households in income status group)

| Number of blocks<br>of land | 1978                 |                          | 1952              |              |
|-----------------------------|----------------------|--------------------------|-------------------|--------------|
|                             | Target<br>households | Non-target<br>households | All<br>households | All<br>farms |
| 1                           | 40                   | 41                       | 40                | 20           |
| 2                           | 38                   | 35                       | 38                | 48           |
| 3 or 4                      | 18                   | 19                       | 18                | 28           |
| 5 or more                   | 4                    | 5                        | 4                 | 4            |
| Total                       | 100                  | 100                      | 100               | 100          |
| Blocks per farm             | 2.0                  | 2.0                      | 2.0               | 2.3          |

Source: Computer printout table 189, O.P. Blaich, Department of Agriculture, British Guiana, Agriculture in Guiana, Census 1952, Volume 1, No. 1.

about 2.5 acres more of the foodcrops. Almost all of this additional acreage was devoted to coconuts and sugar cane, traditionally considered high return crops.

Table 4-15. Acreage per Household in Major Crops, Target and Non-target Farm Households, 1978

|                                      | Target<br>households | Non-target<br>households | All<br>households |
|--------------------------------------|----------------------|--------------------------|-------------------|
|                                      | -----acres-----      |                          |                   |
| Total land                           | 12.96                | 21.71                    | 15.93             |
| Total cropland                       | 7.96                 | 11.04                    | 9.04              |
| Riceland                             | 5.27                 | 5.91                     | 5.52              |
| Foodcrops,<br>Pure stands            | 2.73                 | 5.12                     | 3.52              |
| Coconuts                             | .41                  | .93                      | .58               |
| Cane                                 | .22                  | 1.69                     | .72               |
| Corn                                 | .20                  | .17                      | .19               |
| Ground provision                     | .24                  | .20                      | .23               |
| Plantain & bananas                   | .12                  | .21                      | .15               |
| Citrus & pines                       | .10                  | .22                      | .14               |
| Pulses & nuts                        | .01                  | .01                      | .01               |
| Vegetables                           | .06                  | .06                      | .06               |
| Coffee                               | .06                  | .07                      | .06               |
| Mixed, and<br>scattered<br>plantings | 1.31                 | 1.56                     | 1.38              |

Source: Computer printout tables 192 and 212.

The use of land for different crops varies by regions according to the suitability of the soils and climate (Table 4-16). For the major regions the average crop acreages per farm household in rank order were:

- . Northwest-Pomeroon -- coconuts, ground provisions, corn and coffee;
- . Essequibo Coast and Islands -- rice, coconut, and citrus;

Table 4-16. Acreage Per Farm Household in Major Crops, By Region,  
1978

|                      | Northwest-<br>Pomeroon | Essequibo<br>Coast and<br>Islands | West<br>Demerara | East<br>Demerana | West<br>Berbice | East<br>Berbice |
|----------------------|------------------------|-----------------------------------|------------------|------------------|-----------------|-----------------|
| Total land           | 19.83                  | 11.57                             | 10.75            | 15.25            | 24.23           | 18.27           |
| Total cropland       | 10.99                  | 8.02                              | 7.99             | 8.35             | 15.15           | 8.42            |
| Riceland             | .04                    | 5.95                              | 1.78             | 5.14             | 13.36           | 6.03            |
| Foodcrops            | 10.94                  | 2.06                              | 6.21             | 3.21             | 1.79            | 2.39            |
| Pure stands          | 6.34                   | 0.88                              | 5.46             | 2.13             | 1.01            | 0.91            |
| Coconuts             | 1.75                   | .43                               | .01              | 1.07             | .84             | .18             |
| Cane                 | .01                    | --                                | 4.95             | .33              | --              | .07             |
| Corn                 | 1.14                   | .04                               | .02              | .03              | .01             | .32             |
| Ground provision     | 1.44                   | .17                               | .15              | .18              | .05             | .11             |
| Plantain and bananas | .30                    | .17                               | .19              | .14              | .07             | .12             |
| Citrus and pines     | .92                    | .06                               | .02              | .22              | --              | .05             |
| Pulses & nuts        | .06                    | --                                | --               | --               | .01             | .01             |
| Vegetables           | .02                    | .01                               | --               | .17              | .02             | .06             |
| Coffee               | .70                    | --                                | .09              | --               | --              | --              |
| Mixed plantings      | 4.60                   | 1.18                              | .75              | 1.08             | .78             | 1.48            |

Source: Computer printout tables 192 and 212.

- . West Demerara -- sugar cane and rice;
- . East Demerara (including the Demerara River) -- rice, coconuts and sugar cane;
- . West Berbice -- rice and coconuts;
- . East Berbice (including the Berbice River) -- rice and corn.

#### Land Use, Tenure and Farm Size

There were several aspects of land, its use and tenure, that appeared to be different for the different sizes of the farms, although the policy significance of these relationships is not always clear.

Land ownership had a tendency toward concentration at the extremes of size -- a larger proportion of the largest and the smallest farms owned land than did those in the mid-range (Table 4-17). Long-term leases, on the other hand, were concentrated more in the middle-sized groups with a much lower proportion of the land of the extreme-sized groups being held in this fashion. To a large degree, these patterns were off-setting so that the joint incidence of the two forms of tenure together was about the same for each of the size classes. By the same token, the land held under short-term leases and other forms of tenure did not vary much either among households with different sizes of farms.

The low proportion of land that was rented or leased by households with small acreages raises an interesting question as to why they did not try to lease more land to increase the size of their farming operation. The most likely and obvious answer seems to be that they found more lucrative opportunities in off-farm endeavors. On the other hand, it may be that because of their extensive off-farm interests they are generally considered by landlords to be riskier tenants who will not make the land as productive as those who take farming more seriously; that is, they may be considered poorer managers. It is understandable that the larger farms may not need to depend as much on leased or rented land because they have had the opportunity to obtain viable sized units through ownership.

There were some notable differences among different sized farms in their basic use of the land. The mid-range farms had the highest proportion of their land in rice, while

Table 4-17. Some Aspects of Land and Tenure,  
By Farm Size of Farm Households, 1979

(percent of farms in size category)

| Size of<br>farm, acres | Tenure <sup>a</sup> |                     | Land Use <sup>a</sup> |                | Water Control <sup>a</sup> |                     |
|------------------------|---------------------|---------------------|-----------------------|----------------|----------------------------|---------------------|
|                        | Area<br>Owned       | Long-term<br>leases | Rice-<br>land         | Food-<br>crops | Well<br>Drained            | Sufficient<br>Water |
| less than 2.5          | 69                  | 20                  | 28                    | 51             | 65                         | 48                  |
| 2.5 to 4.9             | 51                  | 31                  | 47                    | 41             | 65                         | 44                  |
| 5.0 to 9.9             | 51                  | 38                  | 58                    | 26             | 67                         | 40                  |
| 10.0 to 14.9           | 45                  | 43                  | 52                    | 25             | 62                         | 44                  |
| 15.0 to 24.9           | 30                  | 52                  | 42                    | 36             | 70                         | 50                  |
| 25.0 to 49.9           | 60                  | 32                  | 36                    | 23             | 59                         | 42                  |
| 50.0 or more           | <u>64</u>           | <u>29</u>           | <u>23</u>             | <u>13</u>      | <u>60</u>                  | <u>53</u>           |
| All Farms              | 54                  | 35                  | 35                    | 22             | 64                         | 47                  |

a. Proportions are based on that area of land in farms within each size group.

Source: Computer printout tables 100, 102, 105.

the largest and the smallest groups relied proportionally less on that crop. The small farms tended to have a much higher proportion of their land in foodcrops than those in the mid-range. In addition, 10 to 20 percent of it was unused or in pastures. The large farms, however, had a very small proportion of their land in foodcrops; about 35 to 40 percent of what they had was unused or in pasture. The large farms included several large cattle ranchers located in the backlands along the coast. Ranchers in the Rupununi were excluded from the survey.

There seemed to be no significant relationship between size of farm and the quality of water control on cropland. The proportion of the land that was well-drained varied little from the two-thirds that reflects the national average. Similarly, there was little significant variance among size groups in the proportion of cropland with sufficient access to irrigation water. This suggests that Guyana's drainage and irrigation programs and policies have had a fairly neutral impact on farm size, favoring neither the large nor the small farmers to any important extent.

## CHAPTER 5. FARM PRODUCTION, CONCENTRATION EFFICIENCY, COSTS AND RETURNS

Most of the farming regions, sizes of farms, and different income categories of households produce as a group some of almost every major crop or livestock product that is produced in Guyana. But while such averages are important for observing nationwide patterns of production and productivity, they do not provide an understanding of the agricultural situation as viewed by the individual producers and their households. Nor do the national averages alone identify the target group adequately. Most of the individual farm households within any of these groups tend to concentrate on only one or two of the wide range of products, and produce those with varying efficiencies, varying costs, and varying returns.

The significance of this is that most public efforts to improve agriculture probably should not be based on expectations of complete attention from the farm households, if for no other reason than the households' preoccupation with a wide range of farm and off-farm activities. It is very likely that individual households have priorities which are not likely to coincide fully with those underlying the best-intended public development programs. The result is that they often will not elicit rural farm households the degree of enthusiasm for national farm programs that public officials expect.

A problem may also occur when public programs are oriented to particular commodities of possibly minor importance to many households but of major importance nationally. Rice is a case in point. Despite the relatively dominant position of rice compared to other agricultural products, only about one-half of Guyana farm households produced rice at all in 1978 and only a quarter produced rice as a dominant source of farm income. The farmers who do not specialize in rice could well need a substantially different type of public program than those who do. In sum, developmental programs need to be focused to particular commodities, the

scale of the enterprise, the special circumstances of the household and the social, economic, and regional environment.

The very differences in efficiency and profitability among the target and nontarget groups -- despite the similarity of technologies and use of purchased inputs -- indicate the potential for increasing agricultural effectiveness of many farm operations without an equivalent further increase in imported and expensive inputs. The achievement by the target households of the levels of efficiency attained by the non-target group could raise the target households' net farm incomes to two to three times the current level.

In a sense, this is a conservative estimate of the improved incomes possible without radical changes in technology or inputs; for the standard of the possible yields was not that of the most successful farms, but only that of the higher-income households in terms of per capita income from all sources. Also it does not assume any significant improvement in water control.

#### Concentration of Production

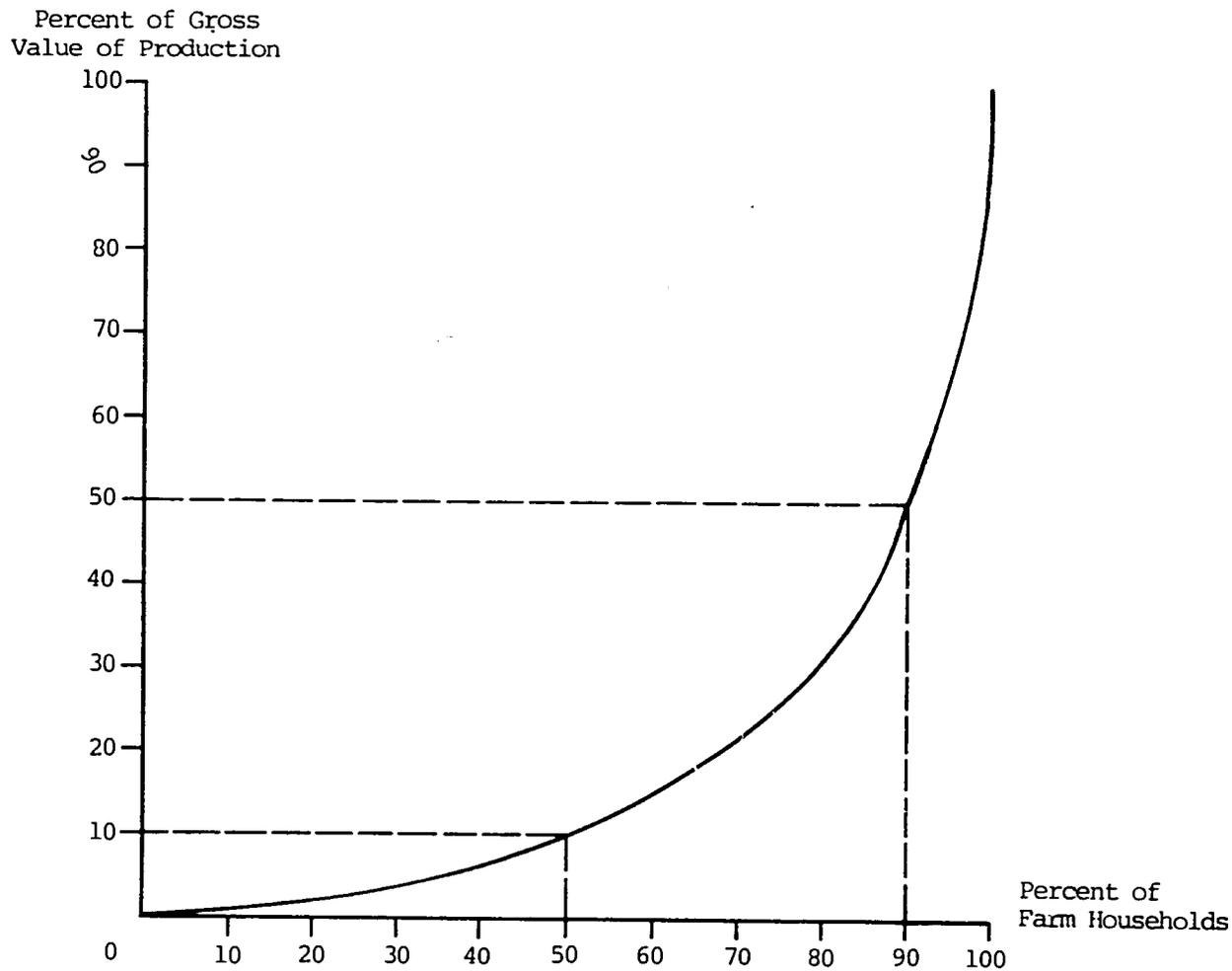
In Guyana, as elsewhere, the major portion of the value of farm production comes from a comparatively few large and highly efficient farms. In 1978 about 10 percent of the producers generated 50 percent of the gross returns from farming. This includes all marketing as well as home consumption (Figure 1). At the opposite end of the spectrum, approximately 50 percent of the smallest farms produced only about 10 percent of the gross farm returns.

#### Crop Concentration

On the basis of the average of all households, most of the many crops grown on Guyana farms constitute an extremely small area. Furthermore, many of these same crops tend to be concentrated regionally; and, within regions, many are grown by a comparatively small number of the farm households. Thus, those households that produce a particular crop generally account for a more significant acreage and a far more important source of income than is indicated by the overall averages (Table 5-1).

Corn is produced primarily in two areas -- the Northwest and the Berbice River. There it is grown by less than one quarter of the farm households. Those who did grow corn in 1978 averaged nearly three acres per grower. Roughly one-third of the corn growers had acreages larger than this and many of them were in the non-target group.

# Figure 5-1 Proportion of Farm Households Producing Farm Products



Source: Appendix Table 349

Table 5-1. Average Crop Areas Per Household  
Producing the Crop, Target and Non-target  
Farm Households, 1978

| Item                            | Target households    |                            | Non-target households |                            | All households       |                            |
|---------------------------------|----------------------|----------------------------|-----------------------|----------------------------|----------------------|----------------------------|
|                                 | Proportion reporting | Average <sup>a</sup> acres | Proportion reporting  | Average <sup>a</sup> acres | Proportion reporting | Average <sup>a</sup> acres |
|                                 | Percent              | Number                     | Percent               | Number                     | Percent              | Number                     |
| Total crop-land                 | 100                  | 8.0                        | 100                   | 11.0                       | 100                  | 9.0                        |
| Riceland                        | 56                   | 9.4                        | 42                    | 14.2                       | 51                   | 10.8                       |
| Food crops                      | 67                   | 4.0                        | 75                    | 6.8                        | 69                   | 5.1                        |
| Of which:                       |                      |                            |                       |                            |                      |                            |
| Mixed                           |                      |                            |                       |                            |                      |                            |
| plantings                       | --                   | 1.9                        | --                    | 2.1                        | --                   | 2.0                        |
| Pure stands                     | --                   | 2.1                        | --                    | 4.7                        | --                   | 3.1                        |
| Selected crops,<br>area planted |                      |                            |                       |                            |                      |                            |
| Rice spring                     | 22                   | 8.9                        | 19                    | 14.9                       | 21                   | 10.7                       |
| Rice autumn <sup>b</sup>        | 48                   | 9.0                        | 35                    | 19.5                       | 44                   | 10.5                       |
| Coconuts <sup>b</sup>           | 12                   | 3.5                        | 11                    | 8.3                        | 11                   | 5.0                        |
| Farmers'<br>cane <sup>c</sup>   | 7                    | 3.3 <sup>d</sup>           | 15                    | 10.9                       | 10                   | 7.5                        |
| Corn                            | 9                    | 2.7 <sup>d</sup>           | 5                     | 3.1                        | 6                    | 2.8                        |

a. Averages are based on the number of farms reporting the crop.

b. Pure stands.

c. Sugar cane in production excludes sugar estates.

d. Acres in last 1978 crop.

Source: Computer printout tables 192, 195, 198, 201, 204, 206, 209, 212.

Those who grew coconuts averaged about five acres in pure stands. The target group averaged only about 3.5 acres while the non-target group had over eight acres.

In 1978, sugar cane was an exceedingly profitable crop and was of considerable importance to the few farmers who had access to the markets of nearby sugar factories operated by GUYSUCO. Most farmers in Guyana were not situated to take advantage of this opportunity. Those farmers who had cane averaged about 7.5 acres per household, and over one-third of the producers grew more than that amount. Most of the growers were non-target households with an average of nearly 11 acres per farm.

Rice production tended to be more ubiquitous. But as indicated, the national average of 5.5 acres does not reflect its importance to individual households because only about 56 percent of them produced rice. Those who did averaged nearly 11 acres per farm -- just over nine acres for the target group and almost 15 acres for the non-target households. Roughly one quarter of the farms had more than 11 acres of rice.

Most farms in Guyana grow various mixtures of provisions, vegetables, and fruit and many grow them in mixed plantings, largely for home use. Therefore, foodcrops, other than cane, corn and coconuts, are distributed more uniformly and more widely than rice.

However, the commercial production of foodcrops tended to be more concentrated. The regionalization and concentration of commercial production has been governed to a considerable degree by the suitability of soils and their comparative disadvantage for rice production. The more than two thirds of the rural farm households that grew significant quantities of these foodcrops produced an average of more than five acres each, and more than one quarter of them produced even more acreage. About three fifths of the foodcrop area was reported to be in pure stands, much of which would be for commercial production and sale in Guyana's urban markets.

#### Livestock Concentration

With the exception of a few large enterprises, livestock production in the coastal areas of Guyana tended to be highly dispersed and predominately small-scale in nature. Over 80 percent of Guyanese farms produce some form of livestock or poultry. Of these, only 4,131 or about 20

percent could be classified as predominantly livestock -- with at least 75 percent of gross returns from the sale and consumption of livestock products -- yet they contributed over half of the value of livestock production in Guyana.

There was some regional concentration in livestock production. Outside of the Rupununi, East Demerara and West Berbice are the two major regions of the country where livestock production is of greatest importance to farmers; East Demerara is also the single largest livestock-producing region of coastal Guyana (Table 5-2). Even in these regions, however, only about a third of the value of farm production comes from livestock.

#### Specialization : Types of Farms

Rice is a major crop in Guyana, yet as indicated it was found that only 27 percent of the households depended on rice production as a major source of farm income<sup>1</sup> (Table 5-3). Only slightly more of the households, 28 percent, depended on food-crops (including farmers' cane) as a major source, and 17 percent depended on livestock sources which included sales plus home use of cattle, sheep, goats, pigs, milk, poultry, and eggs. The remaining 28 percent of the households had mixed farming operations with various combinations of crops and livestock.

The households which specialized in the above production items contributed more to the total product of the country than their proportions would indicate. For instance, the 27 percent of the farms that specialized in rice actually controlled, through ownership or lease, about 61 percent of the riceland. And from this area they produced about 76 percent of the autumn crop paddy in the country and 86 percent of the spring crop. Similarly, 28 percent of the food crop farms controlled as much as 62 percent of the land that is generally considered to be used for those kinds of crops. From this land they produced 71 percent of the total produce that was sold or used on the farm -- 91 percent if sugar cane is included.

The major livestock producers were not as important a factor in total national livestock production as they were in the case of crops. The 17 percent of households surveyed that specialized in livestock and livestock products had only 33

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1. A major source is defined as 75 percent of the gross farm returns being from the sale and home consumption of the commodity.

Table 5-2. Gross Livestock Returns as a Proportion of Gross Farm Returns, by Region, Target and Non-target Farm Households, 1978

(percent)

| Region                         | Proportion of Gross Farm Returns<br>From Livestock |                          |                   | Proportion of<br>total live-<br>stock returns |
|--------------------------------|--|--------------------------|-------------------|---|
|                                | Target<br>households                               | Non-Target<br>households | All<br>households |   |
| Northwest and<br>Pomeroon      | 11   | 10                       | 10                | 2   |
| Essequibo Coast<br>and Islands | 18   | 15                       | 16                | 17  |
| West Coast<br>Demerara         | 12   | 4                        | 6                 | 7   |
| East Demerara                  | 25   | 34                       | 31                | 42  |
| West Berbice                   | 39   | 32                       | 36                | 12  |
| East Berbice                   | <u>16</u>  | <u>20</u>                | <u>18</u>         | <u>20</u>                                     |
| Guyana                         |  |                          |                   | 100   |

Source: Computer printout tables 253, 261.

Table 5-3. Distribution of Households by Type  
of Farm Operation, Target and Non-target  
Farm Households, 1978<sup>a</sup>

(percent)

| Proportions<br>by type of farm             | Target<br>households | Non-Target<br>households | All<br>households |
|--|----------------------|--------------------------|-------------------|
| <u>Proportion among<br/>income classes</u> |                      |                          |                   |
| All farms                                  | 66                   | 34                       | 100               |
| Rice farms                                 | 75                   | 25                       | 100               |
| Foodcrop farms                             | 61                   | 39                       | 100               |
| Livestock farms                            | 59                   | 41                       | 100               |
| Mixed farms                                | 70                   | 30                       | 100               |
| <u>Proportion within<br/>income class</u>  |                      |                          |                   |
| All farms                                  | 100                  | 100                      | 100               |
| Rice farms                                 | 30                   | 20                       | 27                |
| Foodcrop farms                             | 26                   | 34                       | 28                |
| Livestock farms                            | 15                   | 21                       | 17                |
| Mixed farms                                | 29                   | 25                       | 27                |

a. Households were classified into types of farms according to their major sources of gross farm returns which included marketings and home use. The rice, foodcrop and livestock farms were those where gross return from each of the respective groups of commodities exceeded 75 percent. The mixed farm included all others.

Source: Computer printout table 271.

percent of the cattle, 46 percent of the sheep and goats, 46 percent of the poultry, and 54 percent of the hogs. In total, they produced 52 percent of all sales and home use of livestock, poultry, and such products in Guyana. The converse of this is that livestock and poultry are produced widely among other farms as a minor enterprise.

As expected, the 28 percent of the households with mixed farming operations showed no particular concentration in the types of products they produced. In sum, they controlled 25 percent of the riceland but harvested only 20 percent of the total autumn crop acre and only 12 percent of the spring crop acre. In addition, they maintained less than one-fifth of the foodcrop land; raised roughly one quarter of the sheep, goats, poultry and poultry products; and owned about one-third of the cattle and pigs.

#### Income and Household Labor Utilization

The proportion of households with incomes below the target level was significantly different for each of the different types of farming groups. About 75 percent of those that specialized in rice were of the low-income status as were about 70 percent of the households with mixed farming operations. However, only 60 percent of the households in each of the foodcrop and livestock categories had such low family income.

This distribution of income suggests not only that rice was a low-return enterprise in 1978, but also that households specializing in foodcrop or livestock may have had more flexibility for allocating their part-time family labor to farm and off-farm work as the circumstances required. This is supported by the fact that the households associated with these types of farms had substantially more person-weeks working off the farm than did the rice producers -- the foodcrop farms had 35 percent more off-farm work and the livestock farms had 65 percent more (Table 5-4).

These patterns for utilizing family labor seem to contradict conventional thought. Usually livestock production and foodcrop production are thought to be more demanding for labor on a day-to-day basis than is rice. Rice, on the other hand, has traditionally required only strong seasonal peak demands during planting and harvesting, times which require full attention. Between these peaks there is usually considerable time for off-farm work.

Today, many of these assumptions appear questionable. With the high incidence of machine hire for these peak rice operations, it seems that the strong seasonal demands for

Table 5-4. Person-Weeks at Off-Farm Employment  
per Household by Type of Farm Operation,  
Target and Non-target Farm Households, 1978

(Person-weeks)

| Type of farm    | Target households | Non-target households | All households |
|-----------------|-------------------|-----------------------|----------------|
| All farms       | 32.0              | 73.7                  | 48.7           |
| Rice farms      | 26.3              | 60.8                  | 37.5           |
| Food crop farms | 32.2              | 71.9                  | 50.7           |
| Livestock farms | 39.4              | 85.6                  | 61.6           |
| Mixed Farms     | 39.7              | 76.7                  | 49.1           |

Source: Computer printout table 337.

labor usually associated with that crop have diminished. Also it seems that foodcrop and livestock-producing families can work off the farm much of the year. Apparently many of the day-to-day operations can be handled by those who normally do not work off the farm.

The choice of farm enterprise was not coincidental with the size of family nor with the labor available for farm work (Table 5-5). The total number of adult persons (14 to 65 years of age) in households varied some among the different farm types, but not in any apparent cause-effect pattern.

The amount of time available for farm work by part-time and full-time workers was, however, somewhat lower for the households with livestock operations than for the others. They had available to them the equivalent of about a full man-year less work time than the average household specializing in rice or foodcrops, and almost one and one half times more than the foodcrop or mixed farm households.

There were some characteristic differences in the extent to which households sought off-farm employment. About one-third of the households with livestock farms claimed they had members seeking off-farm employment.<sup>1</sup> By the same token, only one-tenth of the foodcrop farms, one-fifth of the mixed farms, and one-quarter of the rice farms reported doing so.

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1. Computer printout.

Table 5-5. Available Farm Labor per Household by  
Type of Farm Operations, Target and  
Non-target Farm Households, 1978

(number of persons)

|  | Target<br>household | Non-target<br>households | All<br>households |
|--|---------------------|--------------------------|-------------------|
| <u>Persons in household</u>            |                     |                          |                   |
| Rice farms                             | 7.0                 | 6.0                      | 6.7               |
| Foodcrop farms                         | 6.5                 | 6.2                      | 6.4               |
| Livestock farms                        | 7.0                 | 6.6                      | 6.9               |
| Mixed farms                            | 7.4                 | 6.4                      | 7.1               |
| <u>Persons age 14-65</u>               |                     |                          |                   |
| Rice farms                             | 4.2                 | 4.2                      | 4.2               |
| Foodcrop farms                         | 3.5                 | 4.0                      | 3.7               |
| Livestock farm                         | 3.8                 | 4.3                      | 4.0               |
| Mixed farms                            | 4.2                 | 4.3                      | 4.2               |
| <u>Available for<br/>for farm work</u> |                     |                          |                   |
| Rice farms                             | 2.9                 | 2.5                      | 2.8               |
| Foodcrop farms                         | 2.9                 | 2.4                      | 2.8               |
| Livestock farms                        | 2.6                 | 2.1                      | 2.4               |
| Mixed farms                            | 3.0                 | 2.3                      | 2.8               |

1. The weeks of part-time household labor available for farm work divided by 50 was added to the estimates of the average number of full-time workers.

Source: Computer printout tables 276, 336, 337.

The search for off-farm work suggests a degree of dissatisfaction with the balance that households have achieved between farm and off-farm work. But at the same time many households were seeking more off-farm work, others were seeking means to improve their income from farm sources. This is suggested in that 28 percent of these farmers claimed to be in need of assistance from field officers of the Guyana Rice Board or the Agricultural Extension Service. Again the households with livestock and mixed farms were seeking more of such assistance than the rice or food-crop households -- one-third as compared to one-quarter.

Apparently the more vigorous search for alternative opportunities by the households with livestock was not because they had a lower total income than their neighbors. In fact, their incomes from all sources were, on the average, about 70 percent higher than those of the rice producers and substantially above those producing foodcrops (Table 5-6). However, the fact that their net income from farming was only 40 percent of that of the households specializing in foodcrops and slightly below those specializing in rice may be what prompted them.

Table 5-6. Household Incomes by Type of Farm Operation, Target and Non-target Farm Households, 1978 (Guyana dollars)

| Income and type of farm                       | Target households | Non-target households | All households |
|---|-------------------|-----------------------|----------------|
| <u>Net Income per household, all sources</u>  |                   |                       |                |
| Rice farms                                    | 913               | 7,299                 | 2,525          |
| Foodcrops farms                               | 1,357             | 7,518                 | 3,769          |
| Livestock farms                               | 1,762             | 7,746                 | 4,215          |
| Mixed farms                                   | 1,648             | 7,468                 | 3,443          |
| <u>Net Income per household, farm sources</u> |                   |                       |                |
| Rice farms                                    | 137               | 3,325                 | 941            |
| Foodcrop farms                                | 525               | 3,916                 | 1,852          |
| Livestock farms                               | 77                | 1,675                 | 732            |
| Mixed farms                                   | 443               | 2,573                 | 1,059          |
| <u>Net Income per capita all sources</u>      |                   |                       |                |
| Rice farms                                    | 136               | 1,217                 | 376            |
| Foodcrop farms                                | 208               | 1,220                 | 591            |
| Livestock farms                               | 251               | 1,165                 | 613            |
| Mixed-farms                                   | 222               | 1,174                 | 483            |

1. Computer printout table 345 A.

There were, as indicated in previous analyses, very few households for which the net incomes from farming exceeded the U.S. or Guyana goal. The following are the percentages

of those within each major type of farm classes that did exceed the goal.

|                 | Percent Exceeding |                    |
|-----------------|-------------------|--------------------|
|                 | <u>U.S. Goal</u>  | <u>Guyana Goal</u> |
| Rice farms      | 6.6               | 3.6                |
| Foodcrop farms  | 14.6              | 11.5               |
| Livestock farms | 5.3               | 1.8                |
| Mixed farms     | 6.2               | 3.1                |

There were two highly profitable sources of farm income in 1978, sugar cane and poultry. Each of these commodities is a primary factor in raising the net income of the households that produced them in significant quantities. Had it not been for these two commodities, the proportion of low income households within the foodcrop and livestock groups would have been much larger than they were.

#### Costs, Returns and Efficiency

There are three personal characteristics of farm operators commonly associated with managerial capability and the costs and returns of farmers. These are age, experience, and agricultural training. There were some small differences among heads of households regarding these characteristics, yet they did not seem to be a major determinant of the level of net income that was earned from all sources (Table 5-7).

The heads of households of the target groups in most types of farm categories tended to be, on the average, a year or two younger than those of the non-target groups, and they had a year or two less farm experience. Also fewer heads of households of the target group reported having attended one or more short courses, or other forms of agricultural training, offered by the Agriculture Extension Service and others. The exception to this was the low income of rice producers -- more of them had such training.

The costs and returns per acre or per animal unit indicate the level of performance of farm managers and the well-being of their households. These indicators combine the sum of the effects of management, the quality of resources used, the economic conditions that prevailed, and the impact of weather. The farm operator can control only some of these variables; much of the variance that results

Table 5-7. Select Characteristics of Heads of Households, by Type of Farm Operation, Target and Non-target Farm Households, 1979

| Characteristic of head and type of farm                     | Target households | Non-target households | All households |
|---|-------------------|-----------------------|----------------|
| <u>Age of Head</u> ----- average years -----                |                   |                       |                |
| Rice farms  | 47.0              | 48.4                  | 47.3           |
| Foodcrop farms  | 48.3              | 51.2                  | 49.5           |
| Livestock farms   | 49.3              | 50.5                  | 49.8           |
| Mixed farms   | 50.1              | 51.1                  | 50.4           |
| <u>Farm Experience</u> -----average years -----             |                   |                       |                |
| Rice farms  | 19.3              | 20.3                  | 19.6           |
| Foodcrop farms  | 15.8              | 17.2                  | 16.3           |
| Livestock farms   | 14.8              | 16.7                  | 15.6           |
| Mixed farms   | 19.1              | 20.4                  | 19.4           |
| <u>Agricultural Training</u> -----percent of operators----- |                   |                       |                |
| Rice farms  | 17                | 14                    | 16             |
| Foodcrop farms  | 20                | 30                    | 24             |
| Livestock farms   | 15                | 24                    | 18             |
| Mixed farms   | 24                | 27                    | 25             |

Source: Computer printout tables 271, 274.

in costs and returns results from factors beyond his control.

#### Rice Production Efficiency

Rice contributed only to about 10 percent of the net income of the average rural household from all sources. But while it was a crop of somewhat diminished importance on the average, it has been, and continues to be, regarded as a crop of great importance to Guyana as a nation. This is because it is thought to have a greater potential for national growth than most other crops. With the possible exception of sugar cane, expansion of rice is less likely to be constrained by the extent of the market than is the case with many of the foodcrops or livestock products where available markets, especially for export, are soon exhausted.

#### 1. Checchi Rice II.

Clearly there is a potential conflict when the country as a whole sees rice as a critical factor for achieving economic growth and well-being, while at the same time those who are responsible for implementing and managing the growth strategy -- the farmers -- do not find it as important in their own economic priorities.

In 1978 about 44 percent of the farm households in Guyana produced an autumn crop of rice and 21 percent produced a spring crop (Table 5-8). Only a modestly higher portion of the low-income households produced rice compared to the non-target group. The difference was most notable for the autumn crop.

Table 5-8. Rice Production, Target and Non-target Farm Households, 1978

|                       | Target<br>households | Non-target<br>households | All<br>households |
|-----------------------|----------------------|--------------------------|-------------------|
| -----percent-----     |                      |                          |                   |
| Households reporting: |                      |                          |                   |
| '78 spring crop       | 22                   | 19                       | 21                |
| '78 autumn crop       | 48                   | 35                       | 44                |
| -----acres-----       |                      |                          |                   |
| Area of rice planted  |                      |                          |                   |
| '78 spring crop       | 8.9                  | 14.9                     | 10.7              |
| '78 autumn crop       | 9.0                  | 14.5                     | 10.5              |

Source: Computer printout tables 198 and 201.

The spring crop is usually considered smaller than the autumn crop in terms of the national total, as well as on many individual farms. While this proved true for the national average area of rice, it was not so for those who produced a rice crop. For them it was similar for each of the two seasonal crops.

The households that planted a spring crop averaged 10.7 acres per farm. However, the nearly twice that number who had planted a fall crop planted about the same area -- 10.5 acres. This pattern was similar within each of the two income groups except that their respective areas differed in size -- the non-target group had about 14.5 acres for each of the two crops, while the target group averaged only 9.1 acres.

Several measures of efficiency indicate that there was substantial room for the target group to increase the use and efficiency of rice resources (Table 5-9). However, even the higher income non-target producers could benefit from some improvement. For example, it is of particular note that in 1978 only three quarters of the available riceland was actually harvested for the autumn crop. About 16 percent of the area was never planted and the rest succumbed to the elements during the growing season.

Table 5-9. Efficiency in Rice Production, all Target and Non-target Farm Households, 1978

| Crop                           | Measure | Target households | Non-target households | All households |
|--------------------------------|---------|-------------------|-----------------------|----------------|
| Autumn crop                    |         |                   |                       |                |
| Area planted <sup>a</sup>      | Percent | 82                | 86                    | 84             |
| Area harvested <sup>b</sup>    | Percent | 86                | 90                    | 87             |
| Farmers planting <sup>c</sup>  | Percent | 86                | 85                    | 86             |
| Paddy per acre <sup>d</sup>    | Bags    | 15.1              | 17.4                  | 15.9           |
| Improved varieties:            |         |                   |                       |                |
| Area planted <sup>e</sup>      | Percent | 75                | 85                    | 79             |
| Farmers reporting <sup>f</sup> | Percent | 66                | 80                    | 70             |
| Spring crop                    |         |                   |                       |                |
| Area planted <sup>a</sup>      | Percent | 37                | 47                    | 41             |
| Area harvested <sup>b</sup>    | Percent | 84                | 95                    | 88             |
| Farmers planting <sup>c</sup>  | Percent | 40                | 45                    | 41             |
| Paddy per acre <sup>d</sup>    | Bags    | 14.1              | 19.7                  | 16.3           |
| Improved varieties:            |         |                   |                       |                |
| Area planted <sup>e</sup>      | Percent | 84                | 96                    | 88             |
| Farmers reporting <sup>f</sup> | Percent | 79                | 90                    | 83             |

- a. Area planted as a proportion of riceland available.  
 b. Area harvested as a proportion of area planted.  
 c. Proportion of farmers with riceland who planted rice.  
 d. Yield of bags of 140 pounds of paddy per acre.  
 e. Proportion of area in improved varieties.  
 f. Proportion of farmers planting improved varieties.

Source: Computer printout tables 192, 198, 200, 201, 203.

Poor water control was undoubtedly a major factor contributing to the use of only part of the available riceland. However, non-planting seemed to be a phenomena that affected entire farms rather than only parts of farms. To a large extent those who planted rice tended to plant nearly all of the acreage available to them.

The unplanted area for the autumn crop of 1978 came about largely because about 14 percent of the households with riceland did not plant a crop at all. But the phenomenon of non-planting was not unique to the target group. Many of the non-target rice producers also did not use all of their riceland. They planted only about 13 percent of their area, and many of them did not plant at all. And those who did plant harvested only 90 percent of that.

The situation was very similar for the 1978 spring crop except that the magnitudes were different. For this crop, just over 36 percent of the total riceland was harvested with almost 60 percent of it having never been planted. Again, those who planted a spring crop tended to plant most of their acreage.

The yields of paddy per acre planted were clear indicators of the superior managerial capability and the better water control available to the high-income per capita households. In general their yields were some 46 percent higher for the autumn crop and some 40 percent higher for the spring crop. This made a substantial difference to their respective net returns from rice. The better water control available to the non-target group is at least partly attributable to their own management even though they do not always have full control of all the contributing factors, especially the off-farm infrastructure. The 1974 Foodcrop Sector Study showed that much of the poor water control was attributable to poorly designed and ill-maintained on-farm systems and that in many cases substantial improvements were possible.<sup>1</sup>

For farms specializing in rice the average net return from producing rice was estimated to be about G\$41 per acre. This "average rice farm" had about 18.6 acres planted in rice for the spring and autumn crops combined<sup>2</sup> (Table 5-10). Its net returns resulted from a gross of G\$246 per acre for

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1. Robert R. Nathan Associates, Inc., Guyana's Foodcrop Systems.

2. The survey data were not designed to provide unit cost of production estimates for commodities because the primary purpose had been to estimate average per capita incomes of farm households in rural Guyana. However, with some minor assumptions the data for farms specializing in rice provide reasonably good approximations for paddy when the spring and autumn crops are considered together. The procedure used here assumes that the minor products are produced at a cost equal to the direct costs plus a share of the overhead costs equal to the proportion of gross return they represent.

Table 5-10. Rice Unit Costs, Returns and Economic Efficiency, Target and Non-target Farm Households Specializing in Rice, 1978

| Item   | Measure                | Target households | Non-target households | All household |
|--|------------------------|-------------------|-----------------------|---------------|
| <u>Cost and Returns per acre planted<sup>a</sup></u> |                        |                   |                       |               |
| Gross return   | Guyana dollars         | 220               | 286                   | 246           |
| Cost of production                                   | Guyana dollars         | 219               | 185                   | 205           |
| Net return   | Guyana dollars         |                   | 101                   | 41            |
| <u>Resources per Household</u>                       |                        |                   |                       |               |
| Acres total land                                     | acres                  | 13.4              | 26.5                  | 16.7          |
| Riceland   | acres                  | 10.5              | 19.4                  | 12.7          |
| Rice planted (both crops)                            | acres                  | 15.1              | 9.3                   | 18.6          |
| Fertilizers & chemicals per acre                     | Guyana dollars         | 25.90             | 25.00                 | 25.60         |
| Own tractor <sup>c</sup>                             | percent                | 24                | 31                    | 26            |
| <u>Spring Crop Efficiency</u>                        |                        |                   |                       |               |
| Area harvested <sup>d</sup>                          | percent                | 51                | 58                    | 54            |
| Paddy yield <sup>e</sup>                             | bags per acre          | 14.8              | 20.4                  | 17.2          |
| Improved varieties <sup>f</sup>                      | percent                | 86                | 96                    | 89            |
| Paddy price received                                 | Guyana dollars per bag | 13.90             | 15.15                 | 14.50         |
| <u>Autumn Crop</u>                                   |                        |                   |                       |               |
| Area harvested <sup>d</sup>                          | percent                | 86                | 88                    | 87            |
| Paddy yield <sup>e</sup>                             | bags/acre              | 17.3              | 17.4                  | 17.9          |
| Improved varieties <sup>f</sup>                      | percent                | 79                | 90                    | 83            |
| Paddy price required                                 | Guyana dollars per bag | 13.75             | 15.10                 | 14.35         |

- a. Includes spring and autumn crop area combined.  
b. Allocated costs for rice and all unallocated costs.  
c. Percent of tractors on all farms in the respective target and non-target groups.  
d. Percent of riceland.  
e. Per acre planted.  
f. Percent of area planted.
- Source: Computer printout tables 282, 288, 290, 291, 293, 316A, 352, 354, 355.

paddy sales and home use, less the average cost of production of G\$205 per acre. By comparison the non-target rice farms had significantly lower costs and substantially higher gross returns than the target households, thereby yielding an average net return of G\$101 per acre. The target households with their poorer resources and poorer management had much higher costs per acre and a considerably lower gross return. This caused them barely to break even -- they had an average net return of only G\$1 per acre.

There were a number of factors indicative of the better management exercised by the non-target households. One possibility is that they may have achieved some economies of scale because of their substantially larger area in rice. However, most notable was the fact that they had substantially higher yields of paddy, especially for the spring crop. In addition, they also received from one to two dollars more per bag of paddy sold. Presumably this was the result of a better average quality of paddy delivered to the mill.

It is clear that there is a modest potential for improved management, particularly of land and water resources, among farmers who specialized in rice production. They produced about 80 percent of Guyana's rice. However, the nonspecializing rice producers who produce the remaining 20 percent also need to be considered for improved management because in virtually all respects their operations were much less efficient than those who specialized.<sup>1</sup>

#### Foodcrop Production Efficiency

Efficiency in foodcrop production is in some respects a more important determinant of household income from farming than was rice. On the average, income from food production comprised almost 50 percent of the nearly G\$1,200 of net income from farm sources and 16 percent of the income from all sources.

The measures of efficiency which are available for specific foodcrops suggest that the target group could improve the productivity of their resources to a considerable degree. In general their yields were lower, they

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1. To verify the intent of this would require a special tabulation. However a comparison of average yields of rice specializing farms (Table 5-10) with all farms that produce rice (Table 5-9) suggests that this would be substantial.

had more of their crops planted in scattered and mixed plantings, and their water control and farm practices seemed inferior to those of the non-target operation. The differences were not always big, but the evidence was persistent enough to leave a strong impression that the target groups seemed to be somewhat less effective farm managers than their higher-income counterparts.

### Sugar Cane

Differences in income and efficiency were particularly noticeable among the 10 percent or so of farm households that produced sugar cane for sale to the sugar factories located in some areas. The non-target households which grew cane undertook its production on a much more important scale than their target counterparts. They averaged nearly 10 acres per household, compared with the target groups who averaged only three acres (Table 5-11). In addition, the non-target groups harvested 17 percent more of the area they had planted, had 35 percent higher yields, and produced cane with a higher sucrose content, as was reflected by the approximately 50 percent higher price which they received.

Table 5-11. Select Indicators of Efficiency in Sugar Cane Production, Target and Non-target Farm Households, 1978

| Item                                | Measure        | Target households | Non-target households | All households |
|-------------------------------------|----------------|-------------------|-----------------------|----------------|
| Households reporting                | percent        | 7                 | 15                    | 10             |
| Average area in cane <sup>a</sup>   | acres          | 3.3               | 10.9                  | 7.5            |
| Average area harvested <sup>b</sup> | percent        | 78                | 87                    | 85             |
| Yield per acre                      | tons           | 22.7              | 31.5                  | 29.8           |
| Price per ton sold                  | Guyana dollars | 25                | 33                    | 32             |

a. Area planted to cane on the date of enumeration divided by the number of households reporting cane.

b. Area harvested as a percent of area in cane on the date of enumeration.

Source: Computer printout table 204.

Within those regions where cane growing was possible, the story was very similar although the cane growers in West Demerara generally had a 20 percent higher yield and about 10 percent higher prices than those in East Demerara. The few who produced cane in East Berbice did about as well as the farmers in West Demerara.

### Corn

Strong differences in production efficiency were also noted among the 7 percent of the rural farm households that produced corn (Table 5-12). Production occurred largely in the Berbice River area; the Northwest; and some in the Pomeroun. While a higher proportion of the target households produced corn, they nonetheless harvested on the average only about two thirds as many acres.

Tables 5-12. Select Indicators of Efficiency in  
Corn Production, Target and Non-target  
Farm Households, 1978

| Item                 | Measure      | Target households | Non-target households | All households |
|----------------------|--------------|-------------------|-----------------------|----------------|
| Households reporting | percent      | 7                 | 5                     | 7              |
| Area harvested       | acres        | 3.1               | 4.4                   | 3.5            |
| Different crops      | number       | 1.2               | 1.2                   | 1.2            |
| Yield per acre       | pounds       | 528               | 836                   | 630            |
| Price per pound      | Guyana cents | 18                | 18                    | 18             |

Source: Computer printout table 206.

In each of the three main corn-producing areas it was possible to obtain two crops per year. However, for reasons that were not revealed, only some of the farmers did so. In 1978 only about 40 percent of the non-target households grew two crops. The target group did not do as well; only 17 percent of them grew two crops. In general, there was a higher incidence of doublecropping in the Northwest where rainfall was unusually more abundant and often more dependable than in the other areas.

The corn yield differences were also substantial. The target group averaged only about 530 pounds per acre harvested throughout the year, while the non-target groups

averaged about 835 pounds, nearly 60 percent more. In 1974 the Department of Agriculture had carried out an intensive subsidized campaign in the Berbice River area to induce farmers to grow corn. This seems to have produced results since yields there were about 20 percent higher than in the older established areas of the Northwest and the Pomeroon where the extension effort had been less pronounced.

### Coconuts

Coconuts are a common sight in rural Guyana. Almost two-thirds of the farm households reported having some coconuts (Table 5-13). However, among these only about 17 percent had them in pure stands, but reported having on the average more than five acres per household. This average acreage was raised by the existence of about 250 large farmers with 10 acres or more, including about 15 households with estates exceeding 50 acres in size.

The overall averages indicate that the sizes of most coconut enterprises are not nearly so impressive. Those who reported having any coconuts at all averaged an equivalent of about 1.3 acres per household with about 0.4 acres in scattered plantings. These same averages for the non-target households illustrate their more serious involvement in coconut production. They had three quarters of their coconuts in pure stands, whereas the target group had only three-fifths of its planted this way. From an efficiency point of view this is significant because trees in scattered plantings are rarely husbanded with sufficient and proper care to make them fully productive.

The differences in management and efficiency were even more prominent in the case of coconut production than in the other crops just mentioned. Most notable were the yields. These averaged nearly 1,100 nuts per acre for the non-target groups but only 600 nuts per acre for the target group.

Coconut yields varied considerably by region. They were reported to be only 250 per acre in East Demerara where there was some suggestion that for economic reasons nuts were not being harvested by small producers and many reported a high incidence of predial larceny. The next to lowest of the regional yields was reported in the Pomeroon, where in recent years disease had reduced production to an average of just over 500 nuts per acre. The other areas in ascending order of yield were:

|               |                   |
|---------------|-------------------|
| West Demerara | 560 nuts per acre |
| East Berbice  | 820 nuts per acre |

Table 5-13. Select Indicators of Efficiency in Coconut Production, Target and Non-target Farm Households, 1978

| Item                                    | Measure | Target households | Non-target households | All households |
|---|---------|-------------------|-----------------------|----------------|
| Households reporting                    | percent | 65                | 70                    | 67             |
| Area pure stands <sup>a</sup>           | acres   | .63               | 1.32                  | .87            |
| Area in scattered planting <sup>b</sup> | acres   | .36               | .41                   | .38            |
| Scattered planting                      | percent | .36               | 24                    | 30             |
| Nuts per acre                           | number  | 608               | 1,074                 | 835            |
| Farms with pure stands <sup>c</sup>     | percent | 18                | 16                    | 17             |

a. Averages based on total households reporting coconuts.

b. Converted on the basis of 60 trees per acre for North-west and Essequibo, 45 for Demerara, and 65 for Berbice.

c. Proportion of coconut acreage.

d. Farmers with pure stands as a proportion of farms reporting coconuts.

Source: Computer printout tables 208, 209.

West Berbice  
Essequito Coast

845 nuts per acre  
900 nuts per acre

### Foodcrop Returns

If one excludes sugar cane, coconuts and corn, about one-third of the "other cropland" was planted to the large variety of foodcrops. Very few households reported not growing any provisions, fruits or vegetable crops. If it is assumed that the 70 percent of households reporting "other cropland" also grew some of these foodcrops, it would represent an average of 2.4 acres per each of these households. About three-fifths of this area was in mixed plantings. Contrary to the experience with other crops, there was very little difference in average area or in the proportion of mixed plantings between the two income groups.

The per acre yields of food crops seemed not to differ greatly between the two income groups (Table 5-14). However, the non-target households achieved a higher level of sales per acre suggesting that their enterprises tended to be oriented more to commercial purposes than to home use. In addition, it may suggest that they marketed a higher quality and higher value product that brought a premium in the market. The target group produced slightly more foodcrops for home consumption.

Those who specialized in foodcrop production had substantially higher returns per acre than those who specialized in rice production -- on the average it was roughly four times as much (Table 5-15). However, much of this was attributable to the fact that about 30 percent of the foodcrop land area was used for sugar cane, which was grown largely under the auspices of the large sugar estates. Most of the cane was grown by the non-target group, who had nearly 45 percent of their total foodcrop planted in cane. In all, the non-target group netted an average G\$366 per acre. The target group fared much less well; they had very little cane and netted only G\$92 per acre.<sup>1</sup>

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1. The tabulations that were available did not permit estimating separate costs for cane and other foodcrop items. However, the data obtained in the survey should lend itself to further analysis in this regard if it is deemed to be useful for policy determination.

Table 5-14. Select Indicators of Efficiency in Foodcrop Production, Target and Non-target Farm Households, 1978

| Item                                | Measure          | Target households | Non-target households | All households |
|-------------------------------------|------------------|-------------------|-----------------------|----------------|
| Households Reporting                | percent          | 67                | 75                    | 69             |
| Area in pure stands <sup>a</sup>    | acres            | .9                | 1.1                   | .9             |
| Area in mixed planting <sup>a</sup> | acres            | 1.4               | 1.7                   | 1.5            |
| Mixed planting <sup>b</sup>         | percent          | 61                | 64                    | 62             |
| Yield per acre                      | pounds           | 620               | 630                   | 620            |
| Sales per acre                      | Guyana dollars   | 170               | 290                   | 220            |
| Home consumption                    | percent of sales | 21                | 15                    | 18             |

a. Average of households reporting other cropland.

b. Based on average pounds produced unweighted for different value crops.

Source: Computer printout tables 192, 210; tabulations of October 5, 1979.

Table 5-15. Foodcrop Farms: Unit Costs, Returns and Efficiency per Household, Target and Non-target Farm Households specializing in Foodcrops, 1978

| Item                                      | Measure        | Target households | Non-target households | All households |
|---|----------------|-------------------|-----------------------|----------------|
| <u>Costs and Returns per acre planted</u> |                |                   |                       |                |
| Gross returns                             | Guyana dollars | 252               | 609                   | 437            |
| Cost of production <sup>a</sup>           | Guyana dollars | 160               | 246                   | 203            |
| Net returns                               | Guyana dollars | 92                | 363                   | 234            |
| <u>Resources per household</u>            |                |                   |                       |                |
| Acres total land                          | acres          | 14.6              | 16.6                  | 15.3           |
| Acres foodcrop land                       | acres          | 5.6               | 10.7                  | 7.8            |
| Acres sugar cane                          | acres          | .7                | 4.8                   | 2.3            |
| Area sufficient water                     | percent        | 60                | 79                    | 65             |
| Fertilizer's chemicals per acre           | Guyana dollars | 23.50             | 37.70                 | 30.50          |
| <u>Production Efficiency</u>              |                |                   |                       |                |
| Cane yield per acre                       | tons           | 22.8              | 31.8                  | 30.5           |
| Cane yield per acre                       | pounds         | 590               | 860                   | 685            |
| Provisions: price received                | Guyana dollars |                   |                       |                |
|   | pound          | .28               | .55                   | .35            |
| Fruit: Price received                     | Guyana dollars |                   |                       |                |
|   | pound          | .22               | .33                   | .27            |

a. Allocated costs for foodcrops, plus all unallocated costs.

Source: Computer printout tables 282, 285, 288, 294, 296, 301, 334; tabulations of October 5, 1979.

In contrast to rice, the high or net returns of the non-target producers who specialized in foodcrops were due in part to higher levels of inputs per acre, particularly of fertilizers and chemicals. These were applied by the non-target groups at a rate of nearly G\$34 per acre compared to the target group which utilized less than G\$24 per acre. To a substantial degree this was influenced by the high rates applied to sugar cane.

To the extent that the different levels of fertilizer and chemical inputs per acre are not attributable solely to cane production, the phenomenon raises a question of optimum input level. In the case of rice most of the households, target and non-target alike, seem to have reached a similar level of fertilizer and chemical application which may or may not be optional. However, in foodcrops, this seems not to be the general case. The significant differential between the target and non-target producers suggests that many foodcrop farmers in the target group have substantial room for additional inputs of fertilizer and chemicals to raise their yields and net return per acre.

Besides the fact that they produced more sugar cane, there is some additional evidence that the superior returns of the non-target households from foodcrop production may be attributable also to better management. It shows up strongly, for example, in the yields per acre planted to corn and cane. In the case of each crop, these yields were about 50 percent higher than the yields obtained by the target group. Better management is also reflected in the prices received for the sales of provision crops and fruit. The foodcrop prices of the non-target group were higher by 50 to 100 percent, not only because they sold a better quality product at a more optimum time but also because they produced products that had an inherently higher market value and a correspondingly higher market value and higher return per acre.

### Livestock and Poultry Production Efficiency

#### Cattle

About one in four farm households in the coastal areas of Guyana owned cattle in early 1979. This proportion was quite constant for all areas except the West Coast, where almost half the households had cattle, and the Northwest and Pomeroun, where almost none had cattle (Table 5-16). About 70 percent of the households that own cattle reported having no grazing land; they rely on access to public front-lands, roadways, rice fields and backdams for forage.

Table 5-16. Cattle: Farm Household Ownership and Access to Grazing Land by Region, 1979

| Region                              | Households With Cattle             |                                |  |
|-------------------------------------|------------------------------------|--------------------------------|--|
|                                     | Proportion of households in region | Proportion having grazing land | Average herd of cattle per household with cattle |
|                                     | -----percent-----                  |                                | ---number---                                     |
| Guyana                              | 28.5                               | 27.2                           | 8.4  |
| Northwest and Pomeroun <sup>a</sup> | 3.7                                | 100.0                          | 2.7  |
| Essequibo                           | 46.7                               | 21.9                           | 4.3  |
| West Coast Demerana                 | 25.2                               | 32.8                           | 3.5  |
| East Demerana                       | 28.1                               | 36.7                           | 8.8  |
| West Berbice                        | 28.2                               | 39.0                           | 29.8   |
| East Berbice                        | 23.5                               | 15.8                           | 8.6  |

a. Data on households with cattle in the Northwest and Pomeroun are based on a small sample and are not statistically reliable.  
Source: Computer printout tables 192, 213.

There was little difference between the target and non-target groups with respect to cattle ownership, although non-target households tended to own slightly larger herds on average (Table 5-17). As was the case for crops, the non-target group farmers provided superior management of their herds. They turned small differences in herd size into much larger differences in cash receipts. They had more than twice the cash receipts from the sale of their animals and of milk than did the target group households. However, the target group did benefit from their cattle more than cash sales alone indicate, as they consumed three-fourths of the milk produced. One factor in the differences in productivity was that the target households had somewhat higher rates of loss, theft and mortality of their cattle, which during the year accounted for more than double the number sold. They also milked their cows less than seven months a year on the average, compared with about eight months for the non-target group. But both groups produced close to the national average of 4.2 pints daily per cow milked.<sup>1</sup>

### Sheep and Goats

About 18 percent of farm households owned sheep or goats in early 1979 (Table 5-18). Essequibo and East Berbice account for at least 30 percent of these households. Non-target households tend to own a larger number than the target groups, particularly in these two regions. Sales generally averaged less than G\$160 per household, with slaughtering for home use being almost as frequent as sales.<sup>2</sup>

### Pigs

Only about 11 percent of farm households owned pigs (Table 5-18). East Demerara and East Berbice each contain about 30 percent of all households with pigs, and together these regions hold about two thirds of the total stock of pigs. East Demerara alone contains about 45 percent of all the pigs. For the households which have them, pigs appear to be of considerable importance for cash income as is reflected by a relatively high value of sales and a relatively low rate of home consumption (Table 5-19). The non-target households with pigs appeared to be able to generate larger revenues from a given stock, with a higher number of sales per sow and higher rates of sales and home use in relation to stock size.

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1. Computer printout table 215.

2. Computer printout table 217.

5-30.

Table 5-17. Cattle: Ownership Sales, Consumption and Losses,  
Target and Non-Target Farm Households, 1978-1979

| Item, households with cattle   | Target                   | Non-target | All  |
|--|--------------------------|------------|------|
|  | -----percent-----        |            |      |
| Proportion of all households<br>in income status group               | 28.1                     | 29.3       | 28.5 |
|  | -----number-----         |            |      |
| Average head of cattle per<br>household                              | 7.6                      | 10.0       | 8.4  |
|  | -----Guyana dollars----- |            |      |
| Average value of cattle sold<br>per household                        | 265                      | 591        | 376  |
| Average value of milk sold<br>per household                          | 118                      | 270        | 170  |
|  | -----percent-----        |            |      |
| Home consumption of milk as<br>proportion of production              | 73.3                     | 52.6       | 67.0 |
| Annual disposition and losses,<br>proportion of cattle owned<br>sold | 6.8                      | 10.2       | 8.0  |
| Lost or stolen   | 4.8                      | 4.4        | 4.7  |
| Died   | 8.7                      | 7.7        | 8.2  |

Source: Computer printout tables 213, 213A, 215.

Table 5-18. Sheep, Goats, and Pigs: Farm Household Ownership by Region, 1979

| Region                 | Sheep and Goats                 |                       | Pigs                            |                       |
|------------------------|---------------------------------|-----------------------|---------------------------------|-----------------------|
|                        | Porportion of households owning | Average per household | Proportion of households owning | Average per household |
|                        | ---percent---                   | --number--            | ---percent---                   | --number--            |
| Guyana                 | 18.0                            | 8.7                   | 11.3                            | 10.0                  |
| Northwest and Pomeroun | 0.1                             | 3.4                   | 11.5                            | 4.4                   |
| Essequibo              | 43.9                            | 6.0                   | 8.7                             | 9.1                   |
| West Coast Demerana    | 8.5                             | 4.1                   | 3.5                             | 18.2                  |
| East Demerana          | 14.9                            | 7.9                   | 14.7                            | 15.2                  |
| West Berbice           | 24.0                            | 13.3                  | 17.2                            | 7.8                   |
| East Berbice           | 18.4                            | 11.5                  | 12.0                            | 6.5                   |

Source: Computer printout tables 207, 220.

Table 5-19. Pigs: Ownership, Production Sales, Consumption  
and Losses, Target and Non-Target Farm  
Households, 1978, 1979

| Item, households with pigs                                 | Target            | Non-target | All  |
|--|-------------------|------------|------|
|  | -----percent----- |            |      |
| Proportion of households in income<br>status group         | 10.4              | 14.8       | 11.3 |
|  | -----number-----  |            |      |
| Average pigs per household                                 | 8.3               | 12.2       | 10.0 |
| Average annual sales per sow                               | 1.9               | 3.2        | 2.6  |
|  | -----dollars----- |            |      |
| Average value of pigs sold                                 | 387               | 934        | 622  |
|  | -----percent----- |            |      |
| Annual disposition and loss as<br>proportion of pigs owned |                   |            |      |
| Slaughtered for home use                                   | 7.3               | 8.8        | 8.1  |
| Sold   | 37.7              | 72.7       | 56.1 |
| Lost or stolen   | 39.4              | 26.3       | 32.5 |
| Died   | 3.3               | 2.0        | 2.6  |

Source: Computer printout table 220.

Predial larceny was a serious problem for pig producers, particularly for the target group households whose losses were greater than their sales.

### Chickens and Eggs

Three-fourths of Guyanese farms owned some chickens, about two-thirds of which produced eggs. East Demerara and East Berbice dominate production, providing about 65 percent of the nation's chicken and 59 percent of its egg production (Table 5-20). East Demerara is the only region which is heavily oriented toward commercial production mainly for the Georgetown market. This area alone accounted for 83 percent of the total number of chickens sold during 1978. Elsewhere, production for home consumption far outweighed production for sale.

Chicken production in East Demerara by itself accounts for one-fifth of all gross returns from livestock and associated products for Guyana as a whole and is equal to one and a quarter times the value of cattle sales for all of coastal Guyana. Chicken production in the other regions of coastal Guyana exceeds the value of milk production for the nation as a whole.

Egg production accounts for almost half again the value of chicken production. The commercially-oriented East Demerara region is again predominant, although it accounts for a smaller proportion of egg sales -- about a third -- it does for chicken sales. That is, a greater proportion of egg production than chicken production is primarily for home consumption.

As was the case for other products, target households off-set lower cash sales than the non-target groups by consuming at home a higher proportion of chickens and egg production -- well over half (Table 5-21).

### Livestock Farm Production Efficiency

For the households specializing in livestock, the average net returns from livestock units were just over G\$100 per animal unit (Table 5-22).<sup>1</sup> The average household

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1. The survey data did not provide the kind of detail to allocate all expenses to specific kinds of stock in order to estimate costs and return for different classes of livestock. However, the procedure used to calculate returns per animal unit was similar to that used for rice and food-crops, in which expenses specifically attributable to livestock were added to the non-allocated expenses of farms specializing in livestock.

Table 5-20. Chickens and Other Fowls, Farm Household Ownership  
by Region, 1979

| Region                      | Chickens                        |                        | Duck, Turkeys, and Geese           |                        |
|-----------------------------|---------------------------------|------------------------|------------------------------------|------------------------|
|                             | Porportion of households owning | Average per holdsholds | Proportion of of households owning | Average per households |
|                             | ---percent---                   | --number--             | ---percent---                      | --number--             |
| Guyana                      | 76.6                            | 27.2                   | 41.7                               | 12.8                   |
| Northwest and Pomeroon      | 65.3                            | 19.2                   | 14.6                               | 10.0                   |
| Essequibo Coast and Islands | 78.6                            | 20.4                   | 42.9                               | 12.4                   |
| West Coast Demerana         | 66.7                            | 21.0                   | 31.7                               | 10.2                   |
| East Demerana               | 72.6                            | 53.6                   | 38.8                               | 15.8                   |
| West Berbice                | 84.7                            | 20.1                   | 50.0                               | 13.9                   |
| East Berbice                | 82.9                            | 19.3                   | 51.4                               | 11.8                   |

Source: Computer printout tables 222, 225.

Table 5-21. Chicken and Egg Production, Target and Non-Target Farm Households, 1978, 1979

| Item, households with chickens   | Target                   | Non-target | All  |
|--|--------------------------|------------|------|
|  | -----percent-----        |            |      |
| Proportion of households in income status group                            | 78.4                     | 74.1       | 76.6 |
|  | -----number-----         |            |      |
| Average chicken  | 21                       | 40         | 27   |
| Average weekly egg production  | 20                       | 36         | 25   |
| Average annual eggs per hen  | 66                       | 65         | 66   |
|  | -----Guyana dollars----- |            |      |
| Average annual value of chicken sales                                      | 57                       | 446        | 185  |
| Average annual value of eggs sales   | 37                       | 240        | 103  |
|  | -----percent-----        |            |      |
| Home consumption of chickens as proportion of production consumed and sold | 55.2                     | 21.4       | 33.4 |
| Home consumption of eggs as proportion of production                       | 69.8                     | 48.8       | 60.2 |

Source: Computer printout tables 222, 224.

Table 5-22, Livestock: Unit Costs  
Returns, and Efficiency, Target and Non-target Farm  
Households Specializing in Livestock, 1978

|   | Target<br>households   | Non-Target<br>households | All<br>households |
|---|------------------------|--------------------------|-------------------|
| <u>Cost and Returns per<br/>Animal Unit</u> |                        |                          |                   |
|   | --- Guyana dollars --- |                          |                   |
| Gross returns                               | 200                    | 408                      | 298               |
| Cost of production                          | 176                    | 212                      | 191               |
| Net returns                                 | 24                     | 196                      | 107               |
| <u>Resources per<br/>Household</u>          |                        |                          |                   |
|   | --- Number ---         |                          |                   |
| Animal units <sup>a</sup>                   | 5.8                    | 8.2                      | 6.9               |
| Cattle                                      | 4.5                    | 4.9                      | 4.7               |
| Sheep and goats                             | 3.4                    | 5.6                      | 4.3               |
| Pigs  | 3.1                    | 4.4                      | 3.7               |
| Poultry                                     | 4.5                    | 9.4                      | 6.8               |
|   | --- Acres ---          |                          |                   |
| Total land area acre                        | 9.0                    | 12.1                     | 10.3              |
| Crop land acre                              | 3.7                    | 2.4                      | 3.2               |
| Other land acre                             | 5.3                    | 9.7                      | 7.1               |
| <u>Production Efficiency</u>                |                        |                          |                   |
|   | --- Pints ---          |                          |                   |
| Milk per cow per<br>year                    | 936                    | 1,285                    | 1,100             |
|   | --- Number ---         |                          |                   |
| Eggs per hen per<br>year                    | 62                     | 60                       | 60                |
|   | --- Percent ---        |                          |                   |
| Sales to inventory:                         |                        |                          |                   |
| Cattle                                      | 8.5                    | 8.7                      | 8.6               |
| Pigs  | 41.4                   | 94.8                     | 67.8              |
| Chickens                                    | 130.8                  | 337.9                    | 255.6             |

a. Animal unit equivalents are calculated: Cattle, 0.7; Sheep and Goats, 0.15; Pigs, 0.25; and Poultry, 0.03.

Source: Computer printout tables 282, 303, 305, 308, 310, 312, 314; tabulations of October 5, 1979.

specializing in livestock had an average inventory of about seven animal units (where one animal unit is the equivalent of one mature cow, about four pigs, six sheep or goats and about 35 chickens). The non-target households with major livestock enterprises earned almost twice that amount per animal unit while the target group earned only about one-quarter as much.

The reasons for this wide differential in net returns of special livestock enterprises is clear. The non-target households had concentrated much of their production effort on poultry meat, mainly broilers, many of which were raised with purchased feed. In fact, the non-target group had roughly twice as much poultry in inventory at the time of the survey as did the target group. Furthermore, they produced on the average about 3-1/2 batches of broilers per year --roughly one batch of 90 birds every 16 weeks. By comparison the sales to inventory ratio of the target households was very low for poultry. They reported an average of only 45 birds on hand at the time of the survey and sold only about 60 birds for meat during the year.

The production of cattle, milk, hogs, sheep and goats were individually of only moderate importance as a source of income for the specialized livestock households, although in total they made a significant contribution amounting to more than one-third of the gross returns from farming. These sources were substantially less than this for the non-target group and amounted to more than half of the gross returns for the target households.

The size of the cattle, sheep, and goat herds on the livestock farm were roughly consistent with the amount of grazing land or otherwise unused land available to them. However, this land was not used optimally with only one animal unit equivalent of cattle, sheep, and goats for every 1.8 acres of such land.

#### Mixed Farm Production Efficiency

The mixed crop-livestock farms were in most respects low budget farms. They had low costs, low yields, low gross returns, and consequently also low net returns. In general they produced a smattering of most kinds of crops and had some of most kinds of livestock produced in Guyana (Table 5-23). Among those farms there was nothing that particularly distinguished the non-target group from their lower income neighbors except that they had control of a substantially larger crop area, had somewhat larger but still modest livestock numbers, and their production efficiency was slightly better. Nonetheless, even though their costs per

Table 5-23. Mixed Crop-Livestock Farms:  
Unit Costs, Returns and Efficiency, Target  
and Non-target Farm Households, 1978

|   | Target<br>group | Non-target<br>group | All<br>households |
|---|-----------------|---------------------|-------------------|
| <u>Crop costs and returns</u>                     |                 |                     |                   |
| <u>per acre</u>                                   |                 |                     |                   |
| --- Guyana dollars ---                            |                 |                     |                   |
| Gross returns                                     | 136             | 212                 | 163               |
| Cost of production                                | 156             | 151                 | 154               |
| Net return  | 29              | 61                  | 9                 |
| <u>Livestock costs and returns</u>                |                 |                     |                   |
| <u>per animal unit</u>                            |                 |                     |                   |
| Gross returns                                     | 182             | 243                 | 204               |
| Cost of production                                | 77              | 80                  | 78                |
| Net returns                                       | 105             | 163                 | 126               |
| <u>Resources per household</u>                    |                 |                     |                   |
| --- Areas ---                                     |                 |                     |                   |
| Total land  | 12.9            | 32.9                | 19.1              |
| Cropland  | 7.8             | 9.7                 | 8.4               |
| Other land  | 5.1             | 23.2                | 10.7              |
| --- Guyana dollars ---                            |                 |                     |                   |
| Fertilizer and chemicals<br>per acre <sup>a</sup> | 16.10           | 15.35               | 15.80             |
| --- Number ---                                    |                 |                     |                   |
| units <sup>b</sup>                                | 3.9             | 5.2                 | 4.4               |
| Cattle  | 3.5             | 4.9                 | 4.0               |
| Sheep and goats                                   | 1.9             | 1.9                 | 1.9               |
| Pigs  | 1.0             | 3.3                 | 1.7               |
| Poultry   | 3.2             | 2.3                 | 2.8               |
| <u>Production Efficiency</u>                      |                 |                     |                   |
| --- Specified units ---                           |                 |                     |                   |
| Paddy per acre <sup>c</sup> (bags)                | 14.1            | 14.7                | 13.1              |
| Corn per acre <sup>d</sup> (lbs)                  | 450             | 1,020               | 565               |
| Milk per cow<br>per year                          | 900             | 1,025               | 935               |
| Sales to inventory:<br>Poultry (percent)          | 38              | 45                  | 40                |

a. Total cropland.

b. See text for conversion equivalents.

c. Includes spring and autumn crop area planted.

d. Per acre harvested all crops.

Source: Computer printout tables 282, 285, 291, 294, 296, 301, 303, 308, 310, 312, 314; tabulations of October 5, 1979 (except paddy yields).

acre of crops and their costs per animal unit of livestock were nearly identical to each other, their modestly greater efficiency achieved for them a substantially higher gross return.

The mixed crop and livestock producers made less efficient use of their ricelands than the rice farms. For example, only about 75 percent of all available riceland in Guyana was actually harvested for the autumn crop. However, the specialized rice producers, who controlled two-thirds of the riceland, harvested rice from 87 percent of the area that they controlled. On the other hand, the households with mixed farming operations controlled most of the remaining one-third of the riceland but harvested only about 50 percent of it during the same crop season. In sum, this amounts to one-sixth of the available riceland controlled by private households being highly underutilized for the autumn crop and even more severely for the spring crop. The reasons for this are worth investigation.<sup>1</sup>

#### Farm Size and Efficiency

Several of the measures of crop and livestock production efficiency were associated with farm size. However, the relationships were often weak and sometimes negative.

An example of the weak relationship between efficiency and size is the case of rice yield (Table 5-24). The spring crop showed virtually no consistent differences in yields per acre of paddy among the seven size groups. However, the autumn crop showed some -- but this was in a contrary direction. This reversal of the expected relationship occurs because the practices of many of the large rice growers were often less intensive than those of the smaller farms. Also the weather conditions under which the fall crop is produced are generally more hazardous and tend to produce wider variations in yield.

The above relationship was, however, borne out by the proportion of rice growers who used the newly improved varieties of paddy -- Starbonnet and Bluebell. Only 54 percent of the small producers used them, while 88 percent of the large ones did.

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1. One standing point in such investigation would be the data from the Rural Farm Household survey for such farmers with unused riceland which are suitable for further tabulations and analysis.

Table 5-24. Select Measures of Farm Household Cropland Efficiency, by Size of Farm, 1978

| Size of farm, acres | Paddy Yields <sup>a</sup> |             | Improved rice varieties <sup>b</sup> | Cane yields | Corn yields | Average crop returns <sup>d</sup> |
|---------------------|---------------------------|-------------|--------------------------------------|-------------|-------------|-----------------------------------|
|                     | Spring crop               | Autumn crop |                                      |             |             |                                   |
|                     | bags/acre                 | bags/acre   | percent                              | tons/acre   | pounds/acre | Guyana dollars                    |
| less than 2.5       | 20.7                      | 17.1        | 54                                   | 23.9        | 476         | 637                               |
| 2.5 to 4.9          | 13.8                      | 18.0        | 61                                   | 20.0        | 550         | 295                               |
| 5.0 to 9.9          | 15.2                      | 19.3        | 67                                   | 23.1        | 924         | 297                               |
| 10.0 to 14.9        | 16.6                      | 16.8        | 78                                   | 28.8        | 593         | 300                               |
| 15.0 to 24.9        | 15.6                      | 16.0        | 82                                   | 34.3        | 567         | 432                               |
| 25.0 to 49.9        | 17.5                      | 16.9        | 72                                   | 20.1        | 508         | 249                               |
| 50.0 or more        | <u>17.4</u>               | <u>13.2</u> | <u>88</u>                            | <u>23.2</u> | <u>670</u>  | <u>225</u>                        |
| All Farms           | 16.3                      | 15.9        | 79                                   | 29.8        | 631         | 390                               |

a. 140 lbs. bags per acre planted.

b. Proportion of acre planted to paddy for the autumn crop of 1978.

c. Based on total acre harvested.

d. Includes value of all crop sales and home use per acre of total cropland.

Source: Computer printout tables 108, 110, 111.

Except for some unexplainable aberrations, the yields of sugar cane and corn showed no evidence of being correlated with size of farm. Similarly the average value of crop returns (sales and home use) per acre of cropland showed no association except that the smallest farms, with their more intensive operations, had about twice as much output per acre than did the other size households. Undoubtedly there were multiple factors that clouded these relationships.

As with crops, several measures of livestock production efficiency thought to be positively related to the size of the farm proved not to be so (Table 5-25). The major exception was in the number of eggs laid per hen per year. This showed a fairly strong but erratic association with size. A strong but opposite trend was observed in the value of livestock returns per acre of total land. This decreased sharply from an average of G\$955 per acre for the very intensive operations of the smallest farm units to only G\$15

per acre for the very extensive ranch-type operation of those in the largest size group.

Table 5-25. Select Measures of Farm Household Livestock Efficiency, by Size of Farm, 1978

| Size of farm, acres | Livestock Returns     |                              | Milk      | Eggs      | Farms            |
|---------------------|-----------------------|------------------------------|-----------|-----------|------------------|
|                     | per acre <sup>a</sup> | per animal unit <sup>b</sup> | per cow   | per hen   | reporting cattle |
|                     | dollars               | dollars                      | pints/day | eggs/year | percent          |
| less than 2.5       | 995                   | 498                          | 4.3       | 61        | 18               |
| 2.5 to 4.9          | 118                   | 341                          | 3.9       | 71        | 25               |
| 5.0 to 9.9          | 81                    | 371                          | 4.5       | 63        | 32               |
| 10.0 to 14.9        | 51                    | 350                          | 4.5       | 43        | 31               |
| 15.0 to 24.9        | 50                    | 297                          | 4.3       | 53        | 30               |
| 25.0 to 49.9        | 36                    | 635                          | 4.2       | 77        | 43               |
| 50.0 or more        | 15                    | 285                          | 3.6       | 112       | 52               |
| All Farms           | 59                    | 399                          | 4.2       | 66        | 28               |

a. Per acre of total land in farms.

b. Animal units weights are: Adult cattle - 1.0 each; young cattle - 0.7 each; sheep and goats - 0.15 each; pigs - 0.15 each; poultry - 0.03 each.

Source: Computer printout tables 125, 134, 176, 178.

Cattle, for the most part, were raised in extensive types of operations that required large areas of native pastureland for grazing. There were only a few intensive beef cattle or dairy operations where animals were confined and fed significantly on purchased feeds. Because the availability of pastureland is the limiting factor for extensive cattle operations, there were obviously fewer of the households with the small farms that had cattle than was the case with the larger land holders. But even so, about 18 percent of small households with the fewest acres had cattle. They grazed these mainly on public lands, road sides, rice fields and back dams. Most of the high return per acre which they reported was from poultry.

#### Supplies and Services

Many farmers expressed some degree of dissatisfaction with their access to farm supplies, machines, medicines, veterinary services, credit or technical assistance (Table 5-26A, B, C). However, the survey did not ascertain whether these same farmers failed to receive altogether the required

Table 5-26A. Proportion of Farm Households Reporting Problems Obtaining Supplies, Machinery Services and Technical Assistance, by Type of Farm, 1978

(percent)

5-42.

|                         | Type of farm <sup>a</sup> |            |                |                     |                 |             |
|-------------------------|---------------------------|------------|----------------|---------------------|-----------------|-------------|
|                         | Guyana                    | Rice farms | Foodcrop farms | Rice foodcrop farms | Livestock farms | Mixed farms |
| Supplies                | 31.4                      | 36.3       | 35.9           | 28.2                | 19.3            | 30.4        |
| Fertilizer              | 15.1                      | 28.4       | 10.1           | 11.2                | 1.9             | 16.7        |
| Lime                    | .6                        | .2         | 1.8            | 1.4                 | --              | --          |
| Seeds & plants          | 5.6                       | 4.0        | 8.8            | 7.1                 | 4.3             | 4.6         |
| Sprays & chemicals      | 12.3                      | 18.5       | 11.1           | 16.7                | 3.5             | 12.7        |
| Feed                    | 1.5                       | --         | .6             | 1.5                 | 6.2             | 1.0         |
| Veterinary drugs        | 3.1                       | 2.5        | 1.9            | 2.9                 | 5.4             | 3.6         |
| Tractor fuel            | .2                        | .8         | --             | --                  | .1              | .1          |
| Spare parts             | 5.4                       | 8.5        | 4.5            | 4.4                 | 2.4             | 5.4         |
| Other                   | 7.2                       | 1.2        | 16.8           | 5.2                 | 4.6             | 4.9         |
| Machinery Services      | 31.7                      | 57.4       | 17.4           | 31.9                | 14.0            | 33.2        |
| Tractor for plowing     | 14.0                      | 25.1       | 5.9            | 17.9                | 6.7             | 16.0        |
| Combine                 | 19.2                      | 44.1       | .5             | 18.6                | 3.2             | 25.5        |
| Land clearing machinery | 1.2                       | 2.0        | 1.2            | --                  | 1.0             | .7          |
| Trenching machinery     | .6                        | .6         | .5             | 4.1                 | --              | .6          |
| Truck or trailer        | 11.3                      | 24.7       | 6.6            | 7.9                 | 5.0             | 7.2         |
| Pumps                   | 1.7                       | 2.4        | .7             | 4.2                 | .7              | 2.5         |
| Other                   | 2.5                       | .9         | 6.5            | --                  | .8              | 1.1         |
| Technical Assistance    | 16.5                      | 14.3       | 14.2           | 18.3                | 17.2            | 20.9        |
| GRB officer             | 4.7                       | 9.7        | .3             | 2.0                 | 2.2             | 6.2         |
| Agriculture officer     | 6.9                       | 3.9        | 10.9           | 8.9                 | 5.2             | 6.2         |
| Plant protection        | 5.4                       | 2.9        | 8.5            | 7.1                 | 3.2             | 5.7         |
| Veterinarian            | 5.8                       | 3.5        | 2.3            | 5.5                 | 11.9            | 8.3         |
| Livestock officer       | 2.9                       | 1.9        | 1.4            | --                  | 5.5             | 4.5         |

Source: Computer printout tables 278, 331, 332, 333 tabulations of October 5, 1979.

Table 5-26B. Proportion of Farm Households Reporting Problems Obtaining Supplies, Machinery Services and Technical Assistance, by Type of Region, 1978

(percent)

|                         | Region <sup>b</sup>          |           |                        |                  |                 |                 |
|-------------------------|------------------------------|-----------|------------------------|------------------|-----------------|-----------------|
|                         | Northwest<br>and<br>Pomeroon | Essequibo | West Coast<br>Demerara | East<br>Demerara | West<br>Berbice | East<br>Berbice |
| Supplies                | 47.5                         | 28.0      | 36.6                   | 28.1             | 22.2            | 33.3            |
| Fertilizer              | 2.3                          | 16.1      | 14.3                   | 11.0             | 3.7             | 24.6            |
| Lime                    | .7                           | --        | 3.2                    | .5               | --              | .1              |
| Seeds and plants        | 14.7                         | 3.3       | 4.8                    | 6.2              | 4.1             | 5.6             |
| Sprays and chemicals    | 8.3                          | 14.3      | 12.7                   | 7.9              | 3.9             | 17.6            |
| Feed                    | 3.7                          | 2.0       | .6                     | 1.1              | 1.9             | 1.3             |
| Veterinary drugs        | 4.7                          | 3.0       | 4.3                    | 2.5              | 4.6             | 2.5             |
| Tractor fuel            | --                           | .3        | --                     | .4               | .1              | .3              |
| Spare parts             | 4.0                          | 6.2       | 4.7                    | 4.7              | 7.9             | 5.2             |
| Other                   | 30.5                         | 3.0       | 11.4                   | 9.0              | 3.5             | 2.6             |
| Machinery Services      | 15.9                         | 49.2      | 35.2                   | 17.4             | 35.4            | 31.4            |
| Tractor for plowing     | 1.8                          | 30.1      | 14.1                   | 5.0              | 12.2            | 13.3            |
| Combine                 | --                           | 33.3      | 12.7                   | 7.2              | 29.3            | 23.1            |
| Land clearing machinery | 3.8                          | 2.0       | 1.6                    | .7               | .9              | .4              |
| Trenching machinery     | 1.7                          | .6        | 1.8                    | .1               | 1.0             | .1              |
| Truck or trailer        | 2.9                          | 24.3      | 14.2                   | 5.6              | 3.8             | 9.8             |
| Pumps                   | .9                           | .4        | 1.1                    | 1.3              | 1.1             | 3.6             |
| Other                   | 9.0                          | .7        | 6.4                    | 2.6              | .3              | 1.2             |
| Technical Assistance    | 24.4                         | 8.2       | 13.9                   | 16.4             | 20.9            | 14.0            |
| GRB officer             | --                           | --        | 1.4                    | 1.8              | 6.6             | 7.3             |
| Agriculture officer     | 19.9                         | 6.7       | 6.3                    | 6.9              | 5.3             | 4.2             |
| Plant protection        | 11.2                         | 3.8       | 6.2                    | 5.9              | 6.9             | 3.7             |
| Veterinarian            | 2.8                          | .9        | 6.1                    | 7.0              | 10.4            | 3.0             |
| Livestock officer       | 1.9                          | .6        | 1.1                    | 3.8              | 3.6             | 2.3             |

Source: Computer printout tables 98, 151, 152, 153 tabulations of October 5, 1979.

Table 5-26C. Proportion of Farm Households Reporting Problems  
Obtaining Supplies, Machinery Services and Technical  
Assistance, Target and Non-Target Households,  
1978

(percent)

|                                       | Target<br>households | Non-target<br>households |
|---------------------------------------|----------------------|--------------------------|
| <u>Supplies</u>                       | 32.1                 | 30.0                     |
| Fertilizer                            | 16.8                 | 11.7                     |
| Lime                                  | 0.6                  | 0.6                      |
| Seeds and plants                      | 5.9                  | 5.2                      |
| Spray and chemicals                   | 12.6                 | 11.5                     |
| Feed                                  | 1.2                  | 2.1                      |
| Veterinary drugs                      | 2.7                  | 4.0                      |
| Tractor fuel                          | 0.2                  | 0.4                      |
| Spare parts                           | 5.5                  | 5.2                      |
| Other                                 | 7.3                  | 7.1                      |
| <u>Machinery Services</u>             | 33.2                 | 28.6                     |
| Tractor for<br>plowing                | 15.5                 | 11.0                     |
| Combine                               | 20.7                 | 16.0                     |
| Land clearing<br>machinery            | 1.3                  | 1.0                      |
| Trenching machinery                   | 0.8                  | .2                       |
| Truck or trailer                      | 11.7                 | 10.3                     |
| Pumps                                 | 1.9                  | 1.3                      |
| Other                                 | 2.2                  | 3.3                      |
| <u>Technical Assistance</u>           | 24.9                 | 15.5                     |
| GRB officer<br>Agriculture<br>officer | 7.0                  | 3.3                      |
| Plant protection                      | 10.3                 | 5.4                      |
| Veterinarian                          | 5.1                  | 5.8                      |
| Livestock officer                     | 5.2                  | 7.1                      |
|                                       | 3.2                  | 2.4                      |

Source: Computer printout tables 188, 241, 242, 243.

service, whether they were able to obtain at least some quantity of the supplies they needed, or whether the problem was in delay rather than in quantities.

Access to Services,  
Supplies, and Machinery

Problems with access to services and supplies apparently were not markedly correlated with differences in income. Although the target households fairly consistently showed a higher proportion of problems, the difference from the non-target farmer was usually less than 10 percent.

The magnitudes of problems seemed to more closely related to the needs of certain types of farms and to region location than they were to farm income. Rice farmers experienced what must be considered severe difficulties in obtaining machinery service during 1978. Fully 44 percent reported difficulty in getting combine services for harvesting and about 25 percent had problems getting trucks or trailers to transport their harvest. Another 25 percent reported problems getting tractor services for plowing.

The rice farmers' problems in getting machinery services were most severe in Essequibo where almost 60 percent of these had difficulty in getting combines. They were almost as severe in West Berbice and only slightly less so in Berbice and West Coast Demerara.

Almost 30 percent of all rice farms in Guyana reported that they could not get enough fertilizers. The worst shortages occurred in East Berbice. Also, about 20 percent of the rice farmers were unable to obtain sufficient quantities of sprays and chemicals for disease, weed and pest control.

Rice farms seemed to have more difficulties in obtaining needed supplies and machinery services than other types of farms. They have become critically dependent on purchased inputs of foreign origins, associated levels of technology, and mechanization at a time when severe restrictions were placed on the importation of these items.

Foodcrop farms suffered less severely from inadequate availability of farming supplies largely because the technologies they employed were less dependent on the application of imported or manufactured inputs. Nonetheless, about 10 percent of these farms also reported shortages of fertilizers and other agricultural chemicals.

Farm households in the Pomeroon and the Northwest had generally more severe problems than those in areas where transportation was somewhat easier. About 15 percent of the farm households there reported shortages of seed and plant materials for foodcrop production -- this main enterprise. This was the highest shortfall rate for such items in any part of the country. About 20 percent of their farmers also reported difficulty in obtaining the services of an agricultural officer when needed.

#### The Availability and Use of Agricultural Credit

Slightly under 10 percent of Guyanese farm households reported that they solicited credit during 1978, and of these slightly over half received loan approvals. Rice producers appear to be the heaviest users of credit but only about 14 percent applied. Of those who did, 60 percent received approval (Table 27). The target group sought a proportionally larger number of loans than the non-target group, and their solicitations were approved at least as frequently. For both, however, credit utilization was very low.

Farmers were asked about the length and intended purposes of loans which were refused in 1978. Most replied that they were refused medium and long-term credits. Over 50 percent of those who were refused indicated that they had intended to utilize the funds for land and building improvements or for machinery purchases.

Foodcrop farms, which accounted for 41 percent of the unsuccessful loan applications, seem to have a particular need for long-term credits (Table 5-28). Over 70 percent of the credit they sought was to be devoted to capital investments of the kinds mentioned above.

The greatest unfilled need for short-term credits was among rice farmers. Over 30 percent who needed short-term loans to cover operating expenses were refused.

A correlation existed between farm size and the utilization of credit, even though credit use was low for all sizes. While about 15 percent of those with more than 50 acres of land obtained credit in 1978, only about six percent of the farmers with 5 to 25 acres received it (Table 5-29).

Except for the smallest farms, which had a moderate refusal rate, there was no significant difference among the remaining sizes. It would appear, therefore, that the

Table 5-27. Proportion of Farm Households with a Loan Application in 1978,  
and Percent of these Applications Refused, by Type of Farm,  
Target and Non-target Farm Households

(percent)

|                 | Percent of households with a<br>loan application <sup>a</sup> |            |      | Percent of household with loan<br>application refused |            |      |
|-----------------|---|------------|------|---|------------|------|
|                 | Target  | Non-target | All  | Target  | Non-target | All  |
| All farms       | 10.6  | 6.9        | 9.5  | 48.8  | 51.3       | 48.2 |
| Rice farms      | 14.0  | 12.5       | 13.6 | 39.4  | 43.5       | 40.4 |
| Foodcrop farms  | 13.3  | 4.3        | 9.8  | 65.8  | 73.7       | 67.2 |
| Livestock farms | 3.5   | 2.1        | 2.9  | 45.9  | 60.0       | 50.0 |
| Mixed farms     | 8.2   | 9.9        | 8.7  | 39.6  | 45.0       | 41.5 |

a. Includes both successful and unsuccessful loan applicants.  
Source: Computer printout tables 328, 330.

Table 5-28. Proportion of Farm Households Refused Loans:  
Need for Loan by Type of Farms, 1978

(percent)

| Type of farm    | Crop expenses | Livestock expenses | Land and building improvements | Machinery | Other purposes | All purposes |
|-----------------|---------------|--------------------|--------------------------------|-----------|----------------|--------------|
| All farms       | 11.8          | 5.6                | 40.0                           | 17.2      | 28.5           | 100.0        |
| Rice farms      | 26.1          | 6.1                | 20.8                           | 21.1      | 25.8           | 32.1         |
| Foodcrop farms  | 8.1           | -                  | 56.1                           | 15.5      | 20.5           | 40.8         |
| Livestock farms | -             | 10.0               | 11.7                           | 1.7       | 75.0           | 5.3          |
| Mixed farms     | .8            | 14.5               | 31.5                           | 18.3      | 34.9           | 21.5         |

Source: Computer printout table 330.

Table 5-29. Proportion of Farm Households with a  
Loan Application in 1978 and Percent of these  
Applications Refused, by Farm Size

(percent)

| Farm size, acres | Proportion of households with a loan application | Proportion of households with a loan application refund |
|------------------|--|---|
| less than 2.5    | 2.7  | 68.6  |
| 2.5 - 4.9        | 5.6  | 45.2  |
| 5.0 - 9.9        | 10.6   | 35.7  |
| 10.0 - 14.9      | 11.4   | 54.3  |
| 15.0 - 24.9      | 12.4   | 53.7  |
| 25.0 - 49.9      | 16.7   | 45.1  |
| 50.0 or more     | 28.9   | 47.3  |
| All farms        | 9.5  | 48.2  |

Source: Computer printout tables 148, 150.

observed differences in credit utilization rates are primarily demand-related, with risk aversion being a probable dampening factor among the smaller farmers and the complementarity between credit and capital intensity a factor among the large farms.

The average loans from private sources called for repayment in 11 months, while the corresponding figures for the Agricultural Credit Bank and the commercial banks were 23 months and 17 months, respectively. Some 50 percent of all credit to rural farm households was extended by commercial banks,<sup>1</sup> but, most of this was directed at farms 15 acres and above.

#### A Note on Imported Inputs

Guyana does not have domestic sources of the inputs required to implement the new technologies that have helped boost the output of agricultural products in Guyana and in many other parts of the world. Virtually all of the fertilizer, pesticides, machinery, tractors, fuel, oil, drugs, baby chicks, hatching eggs, some feed, and many other necessary inputs to production are imported and require foreign exchange for payment.

The use of these imported inputs is particularly pervasive in the production of rice. It amounts to about G\$1,500 per rice farm. In foodcrop production the use of such inputs is much less because of the less advanced technology and the lower level of mechanization. It is higher for livestock and poultry operations because of the high dependence on imported feed, baby chicks, hatching eggs, and veterinary supplies.

The basic economic justification for continuing the imports of agricultural inputs is that they should generate more than enough added product and generate sufficient other benefits to warrant the foreign exchange cost. These benefits could be through increases in exports, through the substitution of domestic products that otherwise would have been imported or through the creation of domestic employment opportunities which also may produce or save foreign exchange.

#### Rice Farming

Modern machine and chemical technology have become widespread in the rice industry of Guyana. Although only 12

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1. Computer printout table 149B.

percent of the farms owns tractors and only one in a hundred owns a combine, there is virtually no farmer in the country who does not use a tractor or combine for preparing riceland or for harvesting the crop. The program incentives and policies of the Guyana Rice Board and the Agricultural Extension Services seem to have been so effective that today there are very few rice farmers who do not use fertilizer in amounts approaching the recommended level, seeds of the new hybrid varieties, and the latest chemicals for controlling weeds and pests.

The average farm household that specialized in rice production harvested an average of 17.4 acres, counting both the spring and the autumn crop, and reaped an average of 300 bags of paddy per farmland selling it at an average farm value of about G\$16.00 per bag (Table 5-30).

Table 5-30. Cash Costs of Imported Inputs and Estimated Imported Component for Rice Farming, Farm Households, 1978

(Guyana dollars per household)

| c.i.f.                     | On-farm cash costs | Estimated value of import components <sup>a</sup> |
|----------------------------|--------------------|---|
| Fuel, oil, grease          | 275                | 200   |
| Machine repairs            | 450                | 275   |
| Tools and equipment        | 43                 | 25  |
| Machine hire               | 1,174              | 500   |
| Seed, fertilizer chemicals | 702                | 400   |
| Bags and twine             | 191                | 60  |
| Labor                      | 331                | -   |
| Transport and milling      | 364                | 90  |
| Total                      | 3,510              | 1,550   |

a. The survey provided only an estimate of cash costs; it did not provide a basis for determining the imported component. The c.i.f. estimates provided are strictly the judgment of the analysts.

Source: Computer printout tables 420-414A; tabulations of October 5, 1979, and RRNA estimates.

The total cash costs amounted to more than G\$3,500 per rice farm. The imported components of this are estimated at about G\$1,550.

If one limits the justification to rice production alone, this data suggests that the added value of rice for export attributable to the use of imported inputs should equal at least G\$1,550. At an average 1978 f.o.b. price of G\$916 per ton of rice, the imported inputs would have to generate at least 106 tons of rice or 41 field bags equivalent of paddy in order to break even. This implies an increased yield of only 2.4 field bags per acre, a mere 15 percent. This seems reasonable to achieve.

The added increase in production need not, however, be reflected entirely in the yield. The imported machine technology, which represents part of the added crop, has probably allowed some acres of rice to be brought into production that might not have been cultivated if the traditional means had prevailed. Alternatively, the technology released farm labor that could now be employed in off-farm pursuits.

The use of fertilizer, chemicals, and pesticides has also spread to the production of foodcrops, but not as extensively as for rice. But, mechanization has not yet taken a foothold there mainly because of the small acreages and mixed plantings often involved. A few foodcrop farmers have adopted some of the small-farm power equipment that is available for cultivating and preparing land. However, virtually no machinery is available for harvesting the kinds of foodcrops grown in Guyana.

The average household that specialized in foodcrop production had about 8.2 acres planted to such crops and harvested for sale or home use about G\$3,400 worth of produce (Table 5-31). To do this required an estimated G\$250 of imported inputs -- less than 20 percent of the total. Again, as with rice, the question is whether this increase of foreign inputs can yield an off-setting increment in added production and whether it will be offset by sufficient foreign exchange, earnings or substitution of domestic for imported food. Unfortunately, the survey in itself does not provide sufficient data to answer these questions. However, with the emphasis placed on foodcrop technology in Guyana, an indepth study of this question would seem to be justified.

The use of foreign inputs for livestock and poultry production is also substantial, mainly through the use of imported feeds, drugs, baby chicks and hatching eggs. The average household that specialized in livestock production had utilized nearly G\$1,000 of these items. Again, the detail obtained in the survey was not sufficient to even attempt an estimate of how much of this was imported -- a guess would suggest probably not more than one-third and very likely less.

Table 5-31. Cash Costs of Imported Inputs and Estimated Imported Component for Foodcrop Farming, Farm Households, 1978

(Guyana dollars per household)

|                          | <u>On-farm cash costs</u> | <u>Value of import components<sup>a</sup></u> |
|--------------------------|---------------------------|---|
| Machine operation        | 172                       | 110   |
| Fertilizers, sprays etc. | 236                       | 135   |
| Bags and containers      | 14                        | 5   |
| Other costs              | <u>955</u>                |   |
| TOTAL                    | 1,377                     | 250   |

Source: Computer printout tables 416, 416A; tabulations of October 5, 1979.

## APPENDIX A: SPECIFICATIONS OF DERIVED VARIABLES

Certain variables reported in the Guyana Rural Farm Household Survey tables, such as animal units and imputed interest payments, are calculated values based on the application of certain specific formulas to the survey data. Other variables, such as net household returns, are based on specific accounting conventions adopted. These formulas and conventions will be briefly documented below in order to: 1) aid the interpretation of the figures reported in the survey tables; and 2) facilitate the modification of these formulas and conventions according to the specific needs of future researchers.

### 1. Depreciation of Farm Machinery

In the course of an early review of the Farm Household Survey data, it was found that a preponderance of farmers reported that the current value of the machinery they owned exceeded the purchase value of that machinery considerably. This is thought to reflect the effects of general inflation and a real scarcity phenomenon associated with foreign exchange restrictions of recent years. Under these circumstances, there is some question as to the suitability and interpretation of any of the standard depreciation formulas.

The decision was made, therefore, not to apply such formulas, but to provide information in the tables which will enable others to do so by a formula of their choosing.

Instead, an item reflecting the net annual change in value of farm machinery was calculated and reported in the survey tabulations. This was calculated as follows:

$$\frac{(\text{Current Value}) - (\text{Purchase Value})}{(1979) - (\text{Year of Purchase})}$$

Net farm returns are then reported both unadjusted and adjusted for this estimate of the change in the value of farm machinery which took place during 1978.

2.

All of the information on household returns, of which net farm returns are a component, are calculated on the basis of net farm returns unadjusted for the change in value of farm machinery.

## 2. Type of Farm Definitions

Types of farms were defined according to the proportion of gross farm returns (cash receipts plus the value of home consumption) from a particular farming activity to total gross farm receipts.

If cash receipts and home consumption of rice accounted for 75 percent or more of gross farm returns, the farm was categorized as a rice farm.

If cash receipts and home consumption of crops other than rice accounted for 75 percent or more of gross farm returns, the farm was categorized as a foodcrop farm.

If cash receipts and home consumption from livestock accounted for 75 percent or more of gross farm returns, the farm was categorized as a livestock farm.

All other farms were categorized as mixed farms.

In terms of the components of income recodes used in data tabulation, these definitions can be stated as follows:

### Rice farm

$$\frac{988 + 989 + 995 + 996}{986 + 993} \geq .75$$

### Foodcrop farm

$$\frac{(987 + 994) - (988 + 989 + 995 + 996)}{986 + 993} \geq .75$$

### Livestock farm

$$\frac{990 + 1013}{986 + 993} \geq .75$$

### Rice - foodcrop farm

$$\frac{988 + 989 + 995 + 996}{986 + 993} < .75$$

and,

$$\frac{990 + 1013}{986 + 993} < .25$$

and,

$$.25 \frac{(987 + 994) - (988 + 989 + 995 + 996)}{986 + 993} < .75$$

### 3. The Components of Income

The primary income concept utilized in the RFHS is that of net household returns to capital labor and management. This concept is composed of: 1) net farm returns to capital, labor, and management; 2) net earned off-farm income; and 3) net transfers, investment and other non-farm income.

The net household returns measure includes income accruing to all members of the household, being a return to household labor and management, as well as to Household capital; family labor inputs are not deducted as a cost in arriving at the net income figure.

The principal components of net farm returns and net household returns are summarized below.

#### a. Net Farm Returns

##### Cash Receipts from Marketing

Cash receipts from crops  
 Cash receipts from livestock  
 Cash receipts from processed products  
 Cash receipts from machinery hire

plus

##### Value of Home Consumption

Home consumption of crop products  
 Home consumption of livestock products

minus

##### Operating Expenses

Operating expenses, crops  
 Operating expenses, livestock  
 Interest payments on loans

4.

Operating expenses, general

Rent and lease fees  
Shares to partners  
Wages to managers  
Unallocated labor costs  
Drainage and irrigation rates  
Machinery operating expenses

Labor hire expenses allocated to the production of crops or livestock are included in crop or livestock operating expenses.

b. Net Household Returns

Net Farm Returns

plus

Net Earned Income<sup>1</sup>

Income from labor on sugar estates  
Income from labor on other farms  
Income from non-agricultural employment  
Net income from self-employment

plus

Net Transfers, Investment and  
Other Non-Farm Income

Rent and lease fees  
Pensions  
Investment income

4. Imput Interest Payments  
on Farm Loans

Information was gathered through the Farm Household Survey on the number and value of loans received by farmers during 1978, by source. The length of the repayment period agreed to for each of these loans, as well as actual amounts repaid in 1978 on loans extended in that year and in previous years, was also determined.

The respondent was not asked to break these repayments down into interest and amortization components, however. This make it necessary to estimate, or update, the interest components of these repayments in order to account for this

operating cost in the calculation of net farm returns.<sup>1</sup>

For credit received from the Guyana Rice Board, for either the autumn or the spring rice crops, the following assumptions were made: 1) the term of these crop loans was six months; 2) the annual interest rate charged on GRB loans was nine percent; 3) at a minimum, interest due on GRB loans was paid in 1978.

Therefore, imputed interest for GRB loans was calculated by:

$$.045 \times (680+681)$$

where source codes 680 and 681 contained the amounts of credit obtained for the autumn and spring rice crops, respectively.

For loans made during 1978, imputed interest was calculated as follows:

$$\frac{((12 - (N - 1)) N + \sum_{K=1}^{N-1} N - K)}{144} \times .09 \times (L + 2)$$

Here, the value of source code L+2 is the value of the loan received, .09 is the assumed annual interest rate charged, and N is the repayment period in months if this was less than or equal to 12, or the value 12 if the repayment period was greater than 12 months.

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1. In the course of the preparation of this report, it was discovered that the net receipts from processed products were erroneously doublecounted through inclusion in both farm cash receipts from marketing and in overall household income. The magnitude of the doublecounting is a total of G\$368,000 for all households. This produces an overstatement of income of about G\$2 per capita and up to \$20 per capita for the 5 percent of target households actually producing such processed products. While this discrepancy is certainly not large enough to affect the results and analysis to a noticeable extent, it should nevertheless be corrected in subsequent work with the Guyana Rural Farm Household data.

6.

Given that the date on which the loan was made was not asked of respondents, and that the assumption was made that it was equally likely for the loan to have been extended any number of months prior to December 1978, up to the value of N, the portion of the above formula involving N calculates the expected average period for which interest on these loans was due, as a fraction of a year. This fraction is then multiplied by the assumed annual interest rate and the loan amount, in order to estimate the dollar value of imputed interest payments.

For loans extended prior to 1978, imputed interest was calculated by:

$$(700 \times Y - \frac{700}{.09(1.09)^Y}) \div Y$$
$$(1.09)^Y - 1$$

Here source code 700 contains the value of repayments made during 1978, and Y, estimated independently from RFHS data as 1.33, is the average term of all loans extended in 1978, in years.

Given the assumption of a nine percent annual interest rate,  $\frac{.09(1.09)^Y}{(1.09)^Y - 1}$  is the capital recovery factor. This is

often used in working with annuities according to the following formula:

payment due = principal x capital recovery factor.

The formula employed in the Farm Household Survey arrives at an estimate of annual interest payments by subtracting principal from total repayments over the expected life of the loan, and dividing by the length of that life in years.

##### 5. Mean Months of Production for Milk and Eggs

The Farm Household Survey questionnaire asked respondents to estimate the number of months they generally got egg and milk production.

Average values for these periods of production are presented in the RFHS tabulations. These are not a simple average of questionnaire responses, however. Rather, they are weighted averages where the weights employed were the proportion of the respondents' production to total production within the sorting category in question.

6. The Calculation of  
Animal Units

The aggregate animal unit measure was calculated by applying the following weights to the stocks reported of each of the following livestock types.

| <u>Type of Animal</u>                 | <u>Weight</u> |
|---------------------------------------|---------------|
| Full-grown cow                        | 1.0           |
| Heifers 1 year and over               | .7            |
| Calves less than 1 year               | .4            |
| Bulls, steers and oxen<br>over 1 year | .7            |
| Sheep of all ages                     | .15           |
| Goats of all ages                     | .15           |
| Pigs of all ages                      | .25           |
| Fowls, chickens, broilers             | .03           |
| Ducks, geese, turkeys                 | .03           |

Equines were not included in the animal unit measure.