# A Food Aid Strategy For Haiti:

# Maximizing Developmental Effectiveness

A Report of the

Technical Support to Mission

USAID/Haiti

by

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# STATEMENT OF WORK

## I. Introduction

Haiti is a food deficit country. Agricultural productivities for every major food crop are declining and not keeping up with the increasing population and the increasing demands of the Haitian people. To counter this, food imports are now meeting more and more of the country's nutritional needs. Food aid, in the form of wheat, edible oil, bulgur, cornmeal, cheese, and non fat dry milk under the U.S. Government's PL 480 and Section 416 programs totaled $32.00 and $27.00 Million in FY 86 and FY 87. It is expected that, in future years, food aid will play an even greater role in the development assistance package of the U.S. Government to Haiti. It is imperative, therefore, that the issue of food aid as a development tool for the USAID Mission to Haiti be analyzed. The tasks described herein are designed to provide USAID/Haiti with a food aid strategy for the period 1989-1994 as well as recommendations for commodity mix for FY 88 Title III program.

## II. Tasks to be Accomplished

A) Update and refine the Tuck/AID food gap analysis. Data from ADS II and the HECS project should be included. Recommend commodity mixes for PL 480 and section 416 programs which could be utilized as part of the Mission's food aid program.

B) Analyze the institutional and logistical capacity of local public and private sector agencies and enterprises to absorb food aid within their development programs. Discuss marketing and distribution structures.

C) Based on the analysis above, recommend food aid levels which are consistent with the Mission's agricultural strategy, the nutritional needs of the country and the institutional and logistical capacity to manage the food aid.

D) Discuss the management implications of the recommended food aid program for the USAID Mission by conducting an analysis of the various actors in making decisions concerning the PL 480 program. The roles of the USAID technical offices, i.e., Agriculture, Health, and Education, will be analyzed with a view towards maximizing overall management efficiency of the food aid program in the Mission.

E) Do disincentive analysis/Belman Determination for commodity mix recommended for FY 88 and for period 1989-1994.

F) Identify any food and agricultural issues that may need to be addressed in updating the Mission's development strategy for the next five years. Discuss the effect of proposed levels of food aid on on-going and planned agricultural development programs.

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# PREFACE

This analysis of Haiti's food production, nutrition needs, and food aid programs was initiated in September of 1987. Field work in Haiti took place over the time period September 14 to November 13, 1987. The team leaders, Brady Deaton (Principal Team Leader, VPI&SU) and Arthur Siaway (Tuskegee University), established the conceptual framework for the study and reviewed it with USAID/Haiti staff during the first week of the study. Arthur Siaway remained in Haiti for the entire period of field work, with one week at mid-point spent at Tuskegee University and VPI&SU reviewing progress with colleagues, presenting seminars, and planning strategies for completing the remainder of the field work.

Tom Whitney spent a week in Haiti evaluating the Tuck Model and analyzing the data used in this study. He deserves credit for producing the charts and graphs included in the report. Marilyn Prehm and Jenice Rankins provided invaluable support in interpreting the nutritional aspects of the food gap analysis. This insight added an important dimension to the overall study and contributed to the policy implications and recommendations. They worked in Haiti with Drs. Deaton and Siaway to finalize a draft of the report and present the principal findings to the USAID Mission staff. They are principally responsible for the review of nutritional studies and related interpretations in the document.

The entire team wishes to express appreciation to Mr. Lance Jepson, Supervisor, Agriculture and Rural Development Office, and other USAID staff members for their patience and expertise in orienting the team to the agricultural policies and conditions in Haiti. The USAID staff devoted considerable time in consultation with the team and in thoroughly reviewing an earlier draft of this report. Their comments and suggestions enriched the quality of the report.

Finally, the team expresses its gratitude to Ms. Teresa Quesinberry, secretary in the Office of International Development, VPI&SU, who labored patiently through the typing of several drafts of the report.

# A FOOD AID STRATEGY FOR HAITI: MAXIMIZING DEVELOPMENTAL EFFECTIVENESS

## INTRODUCTION

The country of Haiti stands at a critical threshold for shaping its political and economic future. Concerted, visionary leadership must be put in place in order to guide the re-shaping of the Haitian economy. The purpose of this report is to provide a basis for USAID decisions about the role that its policies may play in a comprehensive agricultural development strategy for Haiti in order to insure that food needs of the country are met and that hunger and malnutrition are eliminated. Hence, both targeted projects and sectoral reforms must be addressed.

Haiti presents a classic case of the political economy of hunger. Hunger and malnutrition plague the lives of a high proportion of the population, particularly the rural poor. Yet, the thrust of government policies, perhaps by necessity, has been directed toward meeting the food needs of a growing urban population. Inadequate attention has been given to developing the adaptive research and extension delivery system that will be required in order to generate major improvements in agricultural production and food distribution.

The agricultural sector must play a vital role in the future in insuring that the balance-of-payments and economic growth targets of the country are achieved. Pricing policies, import regulations, and investment strategies should be designed to strengthen the developmental role of agriculture.

Food aid has been used in the past to help meet the food needs of the country. Sudden periods of shortages that threaten to drive prices up too suddenly have been supplemented by food aid. Yet, the prices of domestically produced grains have risen more rapidly than the prices of imported food grains, principally wheat, minimizing the concern about price disincentives created by food aid imports.

Future policy reform and sustained economic growth will require that food aid be used as a developmental resource and be fully integrated into the agricultural development strategy of the country. Its role in contributing to human resource enhancement and in capital formation that yields more secure, permanent income streams to rural residents through effectively implemented projects must be addressed.

## EXECUTIVE SUMMARY

This study assessed the production trends of major food crops in Haiti and analyzed food needs in the country on the basis of the age and sex composition of the population. This exercise provided a basis for recommendations about future food aid levels and mixes of commodities taking into consideration the market organization and structure for grains and oils, current food aid programs, and an examination of food aid disincentives. The study concludes with a discussion of considerations for the Country Development Strategy Statement (CDSS).

The following points provide a succinct summary of the principal findings of this study:

- Data on domestic food production reveal a stagnant agricultural sector with no promise of meeting the food needs of the Haitian population.

- In spite of domestic prices for most grain crops well above world market prices, conditions in Haiti have not enabled farmers to respond to these prices by increasing their levels of production.

- A strong inverse relationship (-.78) between area harvested of maize and yield per hectare should provide a note of caution about production potential in the absence of new yield-increasing technologies at the farm level.

- No obvious production trend is evident for most principal cash crops of Haiti: coffee, sugar cane, and cotton. An exception is the upward trend for cocoa.

- Substantially more information is needed on food availability over cropping cycles by ecological micro-systems of Haiti. In the absence of such information, the true magnitude of food needs can not be determined, nor can food aid and development strategies be effectively targeted.

- Past studies have revealed serious caloric and nutritional deficiencies in Haiti, particularly among children and women.

- Significant regional differences in food availability over the crop year create serious nutritional problems which need to be addressed.

- Cursory review of Catholic Relief Service (CRS)/MCH infant weight monitoring records suggests that nutritional status is quite sensitive to temporary closing of feeding centers. Increased numbers of severe and moderate malnourished children can be noted following post-vacation re-openings (September and October particularly). This may also suggest the potential ill-effects of varying levels of food availability over the cropping cycle and lack of continuity in food aid deliveries.

- Estimates of food gaps over the 1988-94 period range from 250 to 336 thousand M.T. per year in wheat equivalent terms. These estimates were based on daily caloric needs of 2270 calculated on the basis of Haiti's

population profile adjusted for age and sex composition. Projected production and import levels were based on trend estimates and varying assumptions about the proportion of grains in the diet. The gap estimates are in addition to current levels of food aid.

- o Stimulating agricultural development and food crop production specifically is the only strategy that can reasonably meet the food needs of the country.

- o A significantly expanded food aid program is needed to help meet the food needs of the country for the forseeable future.

- o Recommended future levels of food aid should depend on a variety of factors: (1) the desperate malnourishment prevalent in Haiti, (2) PVO and GOH commitment to a New Initiative, (3) training programs for PVO field staff, (4) leadership that emphasizes economic development and (5) management capacity.

- o A "crisis in legitimacy" appears to pervade food aid programs in Haiti, particularly project-oriented, Title II programs and, more particularly, FFW projects. Disspelling these misperceptions and presenting a more balanced view of food aid projects will require renewed commitment and effective leadership by USAID and PVOs.

- o Analysis of the levels of food aid, domestic production of grains, and price trends provide no evidence of disincentives. The data are consistent with the view that food aid has contributed to the food needs of the country while not harming the economy in any apparent way. The evidence is not consistent with the critical view of food aid held by many people in Haiti.

- o The concept of "disincentives" appears to be a misunderstood term. Disincentives must be interpreted within the context of possible ill effects of food aid on cost-reducing technologies, government pricing policies, and consumer/human capital gains that may accrue to the economy.

- o Edible oil imports under Section 416 and PL 480 play a major nutritional role in Haiti and have been a critical factor in the privatization movement. Accordingly, the Cooperative de Production Agricole et Industrielle des Oleagineaux (COPAIOL) should continue to serve as a competitive standard for the six other processors and help keep prices lower for consumers.

- o The problem of malnutrition in young children is compounded by high levels of infection. An effective development strategy will seek to increase the amount of food available as well as improve environmental sanitation and the use of oral rehydration therapy.

- o The most significant improvements in nutrition are seen with the more malnourished participants in targeted feeding programs. Although malnutrition is widespread, the new initiative should target the most malnourished in rural areas (especially the North). Targeted feeding programs should pay particular attention to the 12-23 month age group to improve the nutritional efficiency of foods given and the environmental sanitation.

## PRINCIPAL RECOMMENDATIONS

**Recommendation 1:**

The major recommendation of this study is our proposal that a new food aid initiative designed to achieve measurable economic growth targets based on food aid contributions to the human capital base, farm assets, and community infrastructure, be formulated by USAID and articulated to the new GOH. The new initiative should be fully integrated into the overall agricultural development strategy of the country, and food aid's contribution to the strategy carefully delineated. The initiative should be developed through structured work-sessions with Private Voluntary Organizations (PVOs), the World Food Program (WFP), and the GOH. The dimensions of the New Initiative should be clearly defined in terms of targeted populations, management structure, and implementation schedules. Undoubtedly, the new initiative will alter working relationships with the GOH regarding import restrictions, local currency management, and systematic interaction among field personnel in the GOH, PVOs, and USAID program components. At a minimum, the dimensions of the new initiative would include the following:

- A phased reduction of food aid levels beginning at some appropriate date after the new GOH is in place and allowing for an acceptable transition period. An annual monitoring of progress toward a targeted ending date based on analysis of agricultural development in Haiti must be undertaken with rigorous measures of progress and changing socio-economic conditions. This targeted ending date would be based on analysis of food aid's contribution to domestic food production capacity, expanded trade potential, and the associated resources to be provided by USAID, GOH, and other public and private entities in the international and domestic communities.

- A development orientation for all food aid programs that will insure a declining need for food aid in the future. Explicit recognition must be given to:

  (1) The human capital benefits and economic growth potential of targeted nutrition programs and consumer benefits accruing from Title III food shipments;

  (2) New job creation generated by increased demand for food and non-food products;

  (3) New income-generating opportunities that are created through greater productivity at the farm level, new skills learned while participating in food aid projects, and value-added jobs created through innovative, community-oriented projects.

- Meaningful coordination among all actors in the food aid program to insure that the program has a cohesive focus, clear direction, and common goals. This will include close working relationships among component programs of USAID, e.g. ARDO, OPVD, OEA, PHO, et al.

- Creative pilot project efforts in carefully selected communities designed to test and evaluate the potential benefits of food aid project activity. A strong local community organization and commitment must be a critical feature of community selection. Such pilot efforts may include projects such as:

  (1) School-based entrepreneurship training and job creation drawing on appropriate elements of school feeding and FFW projects. A capital investment fund for small business related to agricultural and natural resources (e.g. value-added or input-creating businesses could be stressed).

  (2) Low-input, high yield agricultural production based on new knowledge of sustainable, regenerative agriculture (organic farming). Food aid may provide an essential buffer for developing a pilot project in selected Haitian communities to evaluate the potential of generating substantially higher production yields based on intercropping, integrated pest management, and soil building.

  (3) A creative, pilot demonstration project targeted toward the improvement of the quality of life within certain, more densely populated, remote areas could provide new knowledge about management and implementation of potentially high -pay-off projects. Such an effort should build on effective, on-going food aid programs of Food for Work (FFW), Maternal and Child Health (MCH), and School Feeding (SF) combined with other international aid efforts.

**Recommendation 2:**

Food needs in Haiti justify additional shipments of up to 125,000 metric tons in wheat-equivalent terms above the 1987 level, bringing the total recommended shipments to roughly 230,000 metric tons. However, such a significant expansion under Title III could not be handled by the current milling capacity of the Minoterie and, if Title II were significantly expanded, would tax the capacity of PVOs. Accordingly, we recommend that the capacity issue for both milling and management be addressed by USAID, PVOs, and the GOH before such a significant expansion is undertaken.

**Recommendation 3:**

The commodity mix to be recommended for Haiti should be designed to achieve a reasonable degree of food security in the most immediate feasible time. The mix of commodities should be sufficiently broad to enhance the nutritional intake of project recipients, but should send clear signals to the GOH that immediate attention be given to improving Haiti's food production potential.

**Recommendation 4:**

Assistance to meet the fuel needs of Haiti should be given by USAID and PVOs on a grant or concessional sales basis, but clearly distinguished from "food

aid." A "fuel-aid" program, properly conceived and implemented, could be enormously beneficial to the long-term needs of the country.

**Recommendation 5:**

Coordinated nutrition education curricula should be developed, tested, and implemented for school feeding, pre-school, and food for work programs. Mechanisms for monitoring impacts should be embodied into its design. A consortia of nutritionists from among food aid donor countries, government, PVOs, and the private sector should be organized to execute the recommendation.

**Recommendation 6:**

USAID, PVOs and GOH should evaluate alternative strategies for more nutritionally efficient targeting. This would entail assessing the potertial gains in nutrition per unit of food aid for younger children, particularly by implementing pre-school feeding programs with child-survival strategies. Since most children do not attend school, the SFP is a limited approach to reaching the most needy. Alternative approaches should be explored.

**Recommendation 7:**

There is an important need for a research project designed to measure the impact of meeting caloric and associated nutrient needs of farmers through food aid on their long term food production capacity. Benefits of such a research project are two-fold because, during the course of generating the data, agricultural production is likely to significantly increase also.

**Recommendation 8:**

The PVO community in Haiti should be encouraged to coordinate its training efforts with USAID and with GOH personnel to insure a common understanding of the role of food aid in economic development. Problems of training and logistics, computer-aided decision making, community organization, and resource identification are among the practical skills that could be incorporated into such training sessions. More critically, however, is the need to understand the linkages between nutrition and health and the accumulation of human capital, the savings, investment, and consumption decisions made by households that alter the developmental potential of small-scale farms and rural communities, and the processes through which community infrastructure can foster regenerative economic growth.

**Recommendation 9:**

USAID should encourage the GOH to develop and implement an incentive pricing scheme for their farmers to offset the fear of pricing disincentives created by food aid imports.

**Recommendation 10:**

While recognizing the many liabilities under which FFW must labor in Haiti, the FFW program should continue to be strengthened through stringent planning and implementation procedures consistent with the development thrust outlined in Recommendation 1.

**Recommendation 11:**

The most successful FFW projects undertaken by CARE, ADRA, CRS, and WFP, should be carefully evaluated to validate their successful results and to provide sound principles for further project development.

**Recommendation 12:**

USAID should work with PVOs to jointly explore the role of local governments in Haiti in supporting innovative and needed infrastructure development that could be carried out jointly using FFW and local tax revenues.

**Recommendation 13:**

The new Country Development Strategy Statement (CDSS) for Haiti should carefully evaluate the critical interrelationships between nutrition and agricultural production in order to enhance the country's ability to achieve a reasonable level of food security.

**Recommendation 14:**

PVOs will continue to need financial resources to help carry out Title II programs, some of which may be attainable through monetization of commodities. Appropriate arrangements for this should be negotiated with the GOH and/or USAID to receive financial support to undertake appropriate food aid distribution and project development.

**Recommendation 15:**

A national baseline survey of food aid program participants should be undertaken to obtain information on family size and make-up, food aid use at the household level, other food resources, incidence of malnutrition, income and income potential.

# I. ASSESSMENT OF FOOD PRODUCTION IN HAITI

This section describes the food and cash crop production trends for Haiti over the past decade. The section draws on FAO and World Bank data in order to determine the current status of agricultural production, price, and import trends. The authors recognize that available data used in this assessment may be quite unreliable, and readers are urged to exercise caution in interpreting the data. We have used the best known information in all cases in order to provide an overview of the agricultural and nutritional situation in Haiti. Regional distribution of food and cash crops and the extent of technological change will be assessed. Potential expansion will be identified under varying conditions. Tables and charts will be used liberally in order to provide a concise picture of food production trends.

The questionable quality of production data for Haitian agriculture requires caution in interpreting changes over time. Significant fluctuations from year-to-year may be caused by bad weather, erratic planting and harvesting patterns, or simply be due to imprecise data. Inferences drawn from the data should be supported by knowledge gained from multiple sources, informed observers, and resource persons who are familiar with the various approaches being taken to obtain data.

Detailed discussions and revised data on the food production of Haiti is forthcoming in a comprehensive agriculture sector assessment. Other currently on-going data collection and analysis efforts (ADSII & HECS) will also provide in the near future a revised assessment of food production and distribution in Haiti. For these reasons the discussion in this section will only highlight some of the more striking features of food and cash crop production trends over the past decade.

The readers should recognize that productivity of most crops varies markedly across the agro-climatic zones of the country. This should also be kept in mind as research and extension strategies are developed to exploit the production potential of different crops.

## A. Grain Crop Production Trends

Sorghum, rice, and maize are the three most significant staple food crops in the country. As revealed in Table 1.1 and Figure 1.1, neither of these crops shows a particular trend over the past decade. These figures appear to be rough estimates in some cases, as evidenced by the constant figures for cassava and yams over the 1976-85 period. We are not sure how these data are estimated from year-to-year. Maize is grown throughout the country in practically all of Haiti's ecological zones as a single crop, but more predominantly in association with other crops. One report estimated that 42,000 hectares were monocropped while 186,600 hectares were planted in association with other crops. The uses made of the available maize for 1985 are revealed in Figure 1.2.

We were unable to find any reliable information on the use of new inputs such as fertilizer, improved seeds, or pesticides on any of these crops. Apparently, rice production has depended more heavily on irrigation than

TABLE 1.1: DOMESTIC AGRICULTURAL PRODUCTION (1000 MT), HAITI

| YEAR | FOOD CROPS | | | | | | | | CASH CROPS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MAIZE | RICE | SORGHUM | PLANTAINS | BANANAS | CASSAVA | SWEET POTATOES | YAM | COFFEE | COCOA | SUGAR | COTTON | SISAL |
| 1976 | 181.1 | 180.0 | 98.0 | 78.2 | 553.4 | 250.0 | 250.0 | 150.0 | 31.0 | 2.9 | 2,400.0 | 1.6 | 9.7 |
| 1977 | 168.0 | 147.0 | 111.0 | 79.9 | 409.9 | 250.0 | 280.0 | 150.0 | 32.0 | 1.8 | 2,200.0 | 1.0 | 9.4 |
| 1978 | 161.0 | 177.0 | 100.0 | 76.2 | 488.7 | 250.0 | 306.0 | 150.0 | 27.9 | 2.9 | 2,300.0 | 1.5 | 11.7 |
| 1979 | 183.0 | 166.0 | 123.0 | 80.4 | 511.5 | 250.0 | 268.0 | 150.0 | 35.9 | 2.9 | 2,900.0 | 1.6 | 8.6 |
| 1980 | 186.0 | 200.0 | 125.0 | 90.1 | 569.2 | 250.0 | 282.0 | 150.0 | 42.8 | 2.3 | 2,800.0 | 2.1 | 9.4 |
| 1981 | 179.0 | 194.0 | 120.0 | 80.7 | 471.4 | 250.0 | 282.0 | 150.0 | 33.3 | 2.6 | 2,000.0 | 2.7 | 2.8 |
| 1982 | 176.0 | 200.0 | 118.0 | 85.0 | 535.7 | 250.0 | 313.0 | 150.0 | 32.3 | 4.5 | 2,000.0 | 1.2 | 7.1 |
| 1983 | 175.9 | 182.0 | 107.0 | 79.9 | 417.5 | 250.0 | 346.0 | 150.0 | 36.0 | 4.6 | 1,900.0 | 1.7 | 0.2 |
| 1984 | 186.0 | 200.0 | 122.0 | 93.3 | 504.2 | 250.0 | 350.0 | 150.0 | 37.3 | 4.7 | 2,800.0 | 2.0 | 1.0 |
| 1985 | 187.0 | 170.0 | 116.0 | 86.7 | 500.0 | 250.0 | 350.0 | 150.0 | 36.0 | 5.1 | 2,600.0 | 2.0 | 2.1 |

Source: Levitt & Laurent (1986).

Figure 1.1

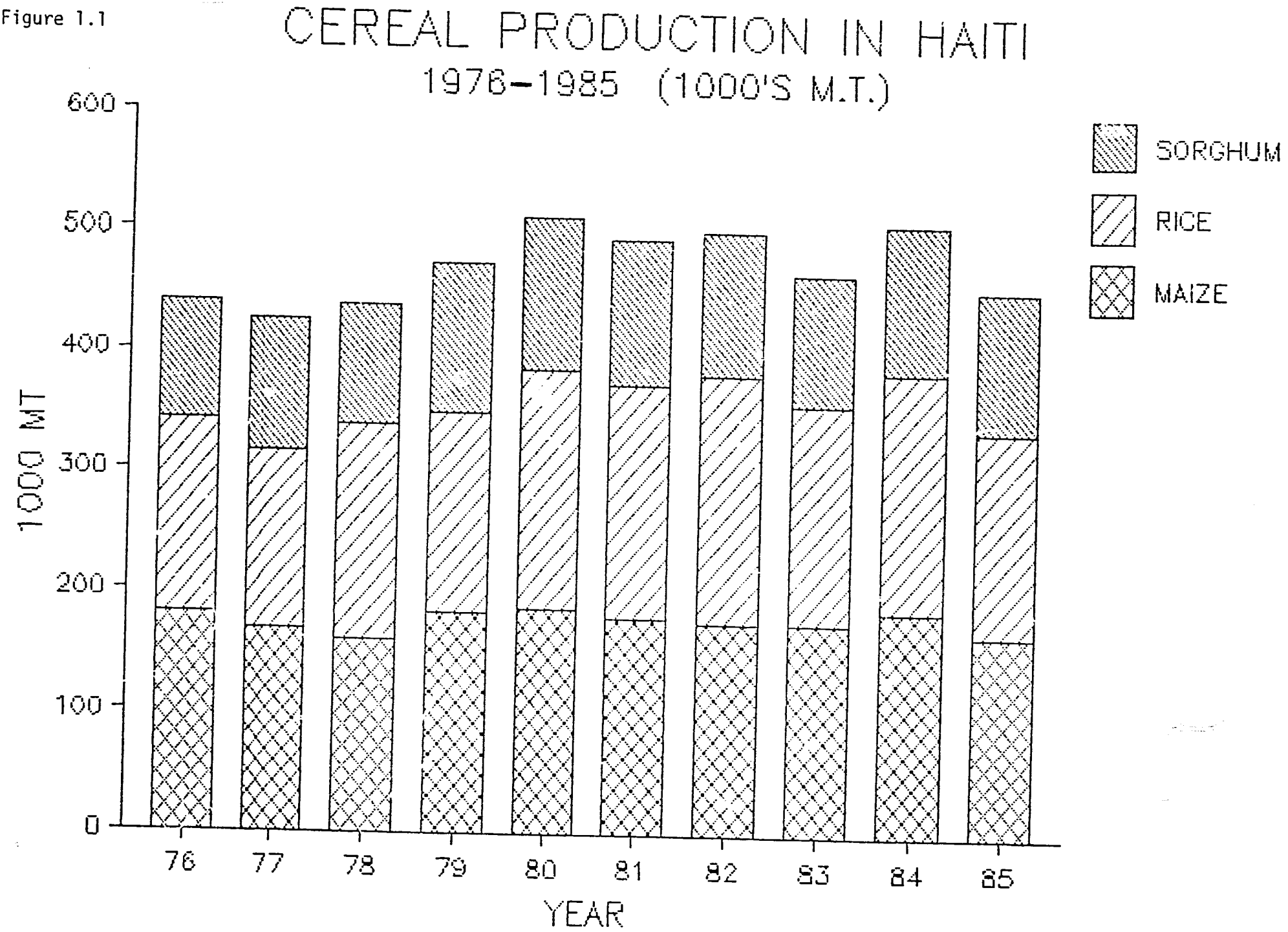
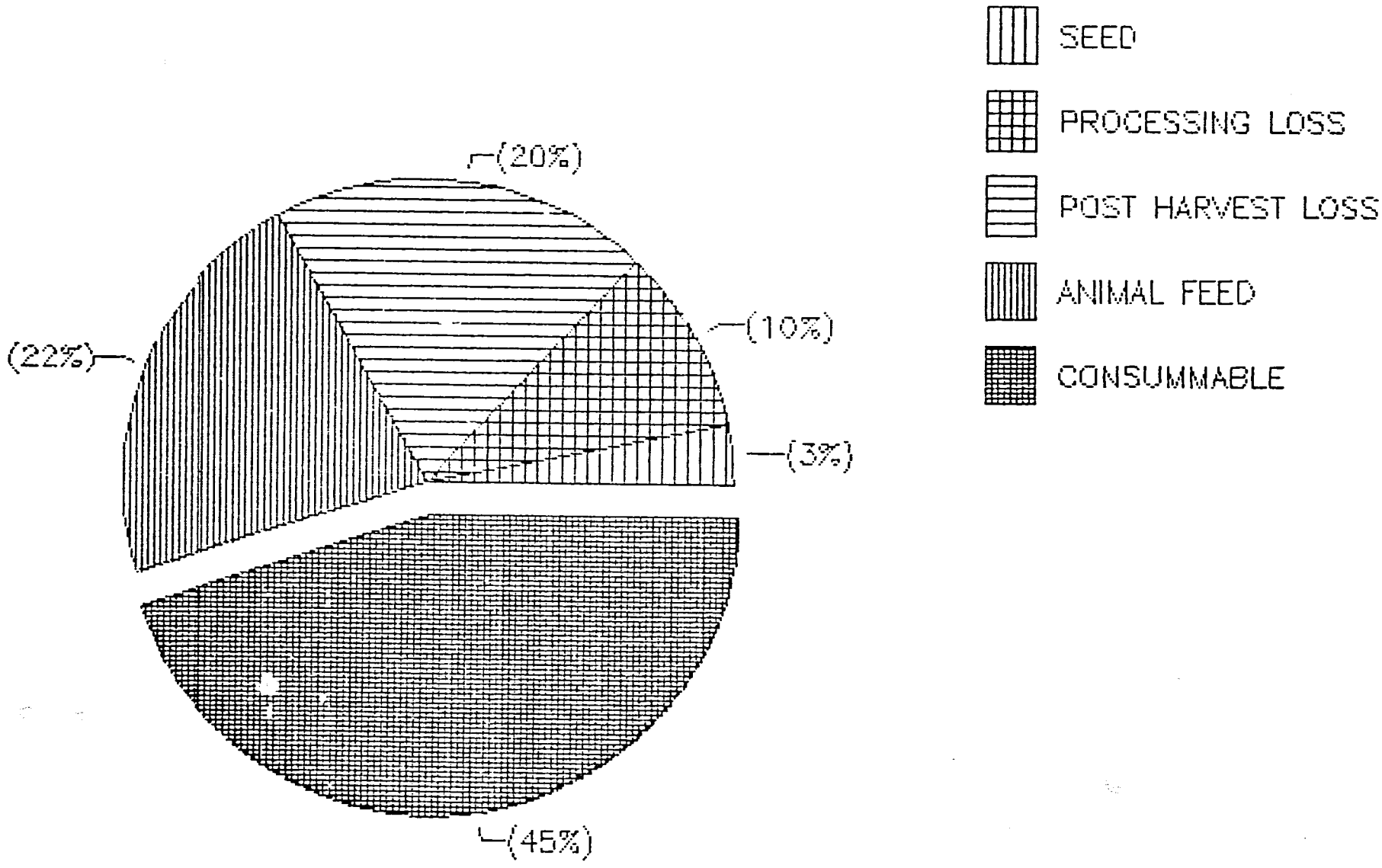

CEREAL PRODUCTION IN HAITI
1976-1985 (1000'S M.T.)
600
500
400
300
200
100
0
1000 MT
76
77
78
79
80
81
82
83
84
85
YEAR
SORGHUM
RICE
MAIZE

Figure 1.2

# ESTIMATED MAIZE CONSUMPTION

## AS A PERCENT OF QUANTITY HARVESTED



have the other grain crops. It is commonly reported that the Artibonite Valley produces 75 percent of the country's rice. Relatively more of the rice crop appears to be monocropped.

Since the question of food aid disincentives will be addressed later in this report, it seems important to point out here that prices for all the food grains produced in Haiti have been maintained well above the world market price. Maize prices have been 35-50 percent higher in Haiti than the c.i.f. border price due to domestic protectionist policies. Such higher prices would be consistent with policies to stimulate domestic production. Yet, almost no evidence suggests either that farmers have responded in a positive fashion or that new inputs were available to sustain a positive response.

In the absence of new yield increasing technologies, the most likely response by farmers to a price incentive is to plant more acreage in that crop. However, such efforts may not result in greater crop yields unless yield-increasing inputs can be brought into the production process. Moreover, attempts to expand crop acreage may simply result in deterioration of the soil through erosion, leaching, and irreversible soil destruction. There is apparently almost no additional tillable land left that can be brought into production.

In order to obtain some insight into the acreage-yield interaction, a correlation analysis was conducted over the 1975-84 period. The annual area harvested, measured in hectares, was correlated with the yield of maize, measured in kilograms per hectare. The results are reported in Table 1.2 and reveal an inverse relationship ($r=-.78$) that is statistically significant. In other words, the results suggest that attempts to increase crop production by increasing the area harvested are largely offset by declines in the yield per hectare. In fact, almost 60 percent of the variation in yield is "explained" statistically by the variation in number of hectares harvested. The relationship would almost certainly have been even stronger (i.e. more negative) if a measure of area planted in the crop (rather that area harvested) could have been used. Undoubtedly, some planted areas are not harvested when they are essentially destroyed during the cropping season for one reason or another. These results simply point out the enormous difficulties of obtaining crop production increases without new technological inputs.

## B. Roots, Tubers, and Other Food Crops

Available data are even weaker for assessing production trends for roots, tubers, and other crops. Constant figures for cassava and yams over the decade simply reveal the absence of any reliable data sources on these crops (Table 1.1). Available figures on sweet potatoes reveal a distinct upward trend for this important staple crop. On the other hand, plantains and bananas show no discernible trend. More accurate and reliable data are needed on these basic food crops in order to better assess food needs in the country. Figure 1.3 provides an overview of these basic food crops and cereals over the 1976-85 period. Our understanding is that the current national surveys (ADS-II and HECS) will provide assessments of these crops.

TABLE 1.2

MAIZE TRENDS: ANNUAL AREA HARVESTED AND YIELDS PER HECTARE, 1975 - 1984

| | AREA HARVESTED | % CHANGE FROM PREVIOUS YEAR | YIELD KG./ HECT. | % CHANGE FROM PREVIOUS YEAR |
|---|---|---|---|---|
| 1975 | 195,000 | | 9,231 | |
| 1976 | 190,000 | (2.60) | 9,474 | 2.60 |
| *1977 | 210,352 | 10.70 | 7,999 | (15.60) |
| *1978 | 248,373 | 18.10 | 6,500 | (18.70) |
| 1979 | 233,749 | (5.90) | 7,843 | 20.70 |
| *1980 | 265,000 | 13.40 | 8,491 | 8.30 |
| *1981 | 200,000 | (24.50) | 9,250 | 8.90 |
| 1982 | 186,000 | (7.00) | 9,140 | (1.20) |
| 1983 | 171,000 | (8.10) | 10,526 | 15.20 |
| 1984 | 200,000 | 17.00 | 9,500 | (9.70) |

Estimated Relationship Area & Yield/hect.

r (1,3) = -.78

$\hat{Y}$ = 1498 - .03X

Y = (Kg.)/Hect.

X = Hectares Harvested

Note: If planted hectares used, would probably get even stronger negative relationship

TABLE 1.3 FOOD GRAIN SUPPLY, DOMESTIC PRODUCTION, AND CONSUMER PRICE INDICES OF GRAINS, HAITI 1976 - 1985

| | TOTAL SUPPLY (MT) OF | | | | | | | | | | DOMESTIC PRODUCTION (MT) OF | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL GRAIN | | MAIZE | | RICE | | SORGHUM | | WHEAT FLOUR | | | | | | |
| | Q | PRICE INDEX | Q | PRICE INDEX | Q | PRICE INDEX | Q | PRICE INDEX | Q | PRICE INDEX | MAIZE | RICE | SORGHUM | TOTAL GRAIN | GRAIN FOOD AID (MT) |
| 1976 | 601,520 | 207 | 131,134 | 243 | 177,760 | 221 | 33,156 | 213 | 144,330 | 150 | 131,100 | 160,000 | 93,000 | 433,100 | 29.3 |
| 1977 | 612,698 | 270 | 137,650 | 332 | 191,900 | 232 | 111,313 | 304 | 121,830 | 150 | 163,000 | 147,000 | 111,000 | 426,000 | 66.7 |
| 1978 | 547,254 | 222 | 166,200 | 282 | 192,000 | 217 | 100,634 | 240 | 88,420 | 150 | 161,000 | 177,000 | 100,000 | 438,000 | 55.4 |
| 1979 | 663,547 | 286 | 208,000 | 363 | 133,800 | 274 | 123,137 | 349 | 148,610 | 150 | 133,000 | 166,000 | 123,000 | 472,000 | 59.5 |
| 1980 | 705,601 | 344 | 191,000 | 487 | 216,200 | 317 | 125,071 | 422 | 173,330 | 150 | 186,000 | 200,000 | 125,000 | 511,000 | 52.7 |
| 1981 | 673,502 | 404 | 189,000 | 541 | 210,300 | 394 | 120,092 | 493 | 153,110 | 188 | 179,000 | 194,000 | 120,000 | 493,000 | 83.6 |
| 1982 | 700,030 | 368 | 134,000 | 470 | 231,000 | 321 | 113,000 | 493 | 157,030 | 188 | 176,000 | 206,000 | 118,000 | 500,000 | 89.9 |
| 1983 | 673,480 | 384 | 134,200 | 511 | 137,000 | 336 | 107,000 | 501 | 135,280 | 188 | 175,900 | 182,000 | 107,000 | 464,900 | 69.7 |
| 1984 | 713,080 | | 134,000 | | 205,000 | | 122,000 | | 132,080 | | 186,000 | 200,000 | 122,000 | 508,000 | 71.6 |
| 1985 | 669,650 | | 173,200 | | 170,000 | | 116,000 | | 205,450 | | 167,000 | 170,000 | 116,000 | 453,000 | 101.2 |

Source: (1) Price Index
Unpublished data IHSI: Corn is 'ground corn' - Rice is the 'superior grade' - data for corn, millet and rice are for Port-au-Prince area. Data for flour are from Minoterie d'Haiti and include taxes. Coffee data are from Capital Consult, S.A. An Analysis of the Haitian Coffee Sector, Toward New Policy Directions, July 1983, and OPRODEX.

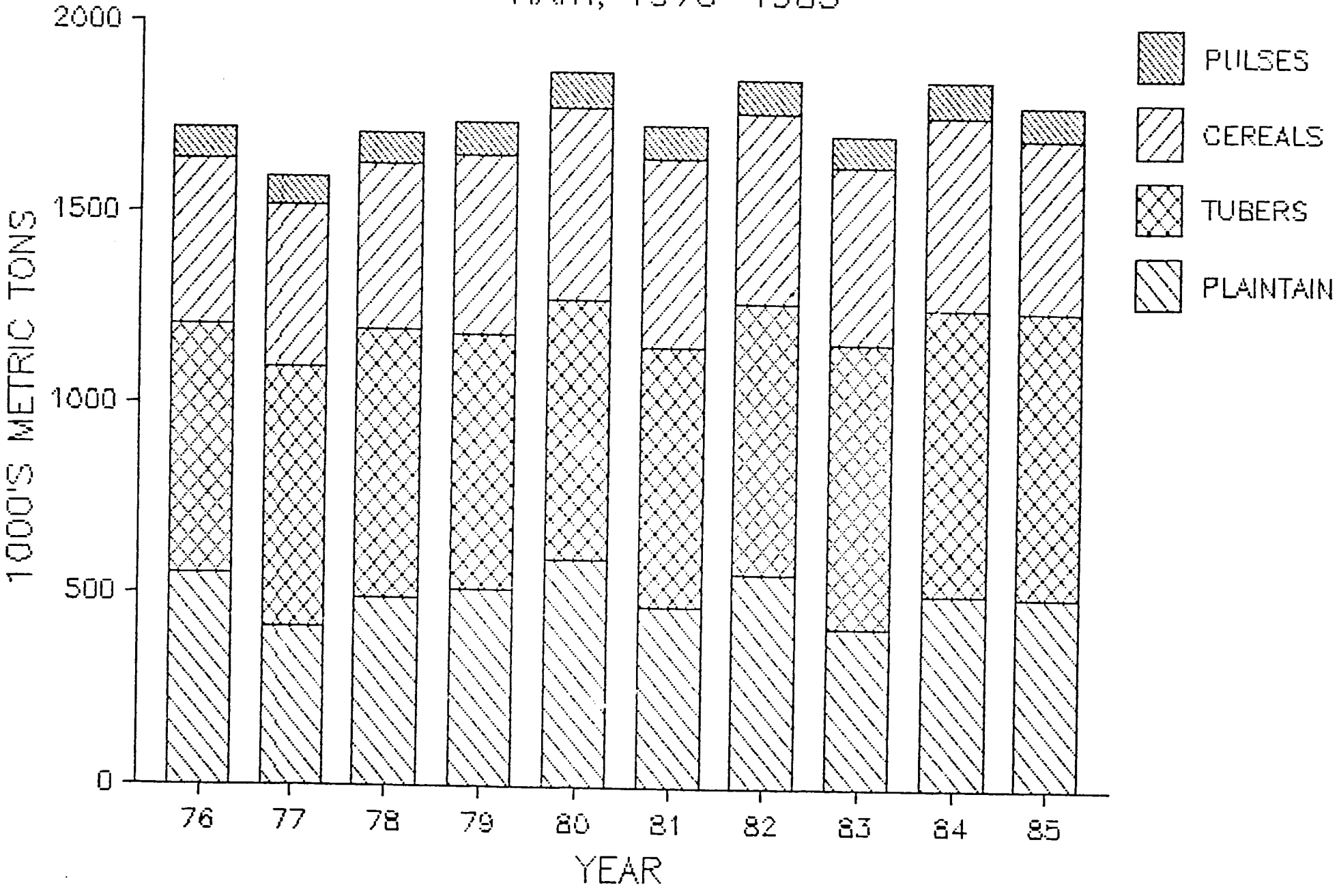
(2) Production and Import: Levitt & Laurent

(3) Grain Food Aid: USAID, Haiti

Figure 1.3

# FOOD PRODUCTION

## HAITI, 1976-1985



C. Food Availability

Domestic food production has been inadequate for meeting the food needs of Haiti. Commercial imports of grains combined with concessional sales and grants of food aid from the U.S. and the European Economic Community (EEC) have been critical supplements to domestic crop production. These combined sources have kept food prices from spiraling upward at a more rapid pace than occurred (Table 1.3) and helped level out the annual consumption per capita.

As evident in Figure 1.4, domestic cereal production per capita has been quite erratic over the 1976-85 period. The sharp drop in per capita production after 1984 reflects, in part, the political uncertainty in the country and perhaps more imprecise data reporting and analysis. It is unlikely that food availability per capita declined as sharply after 1984 as would be suggested by the per capita production decline evident in Figure 1.4, since other evidence shows that retail price trends for grain crops have declined steadily since that time (Figure 1.5). Thus, cereal imports (official and contraband) have probably increased as controls have been relaxed. Real declines in food availability would be associated with food price increases.

This combination of data would reflect either a sharp reduction in purchasing power and/or a greater availability of food in the market. The emergence of significant levels of "contraband" food in the post Duvalier era suggests that relatively higher levels of food have been available in the past two years resulting in price declines for major food grains. The contraband issue is analyzed in more detail in Section III-B below. Since there is likely to be some substitution between food grains and roots and tubers, the prices for the latter may also have been somewhat depressed in the last two years.

D. CASH CROP PRODUCTION

The principal cash crops in Haiti are coffee, sugar cane, cocoa, and cotton. Charcoal made from the relatively sparse trees in Haiti represent another important cash crop for fuel, a crop which will require special assessment in the future development strategies of the country because of its multi-purpose functions in the society, e.g. watershed protection, ecological health, food, and fuel. Sisal was quite important for most of the decade, but the level of production has dropped off sharply in the past few years. Production trends for cash crops over the 1976-85 period are presented in Table 1.1 and Figures 1.6 and 1.7. Again, significant year-to-year fluctuations are the common pattern. A distinctive downward trend is obvious for sisal and possibly for coffee, though the latter is less clear. Sugar and cotton remain more or less constant, but cocoa shows a distinct upward trend.

Sugar cane has historically been an important cash crop for Haiti for three distinct uses: (1) domestic consumption and exports of sugar, (2) production of clairin, a low-grade alcohol, and (3) production of rapadou, a raw sugar, and sugar cane for direct consumption. Most of the production occurs on small-scale farms and production is widespread

Figure 1.4

# CEREAL PRODUCTION PER CAPITA

## HAITI, 1976-1985 (KGS./CAPITA)

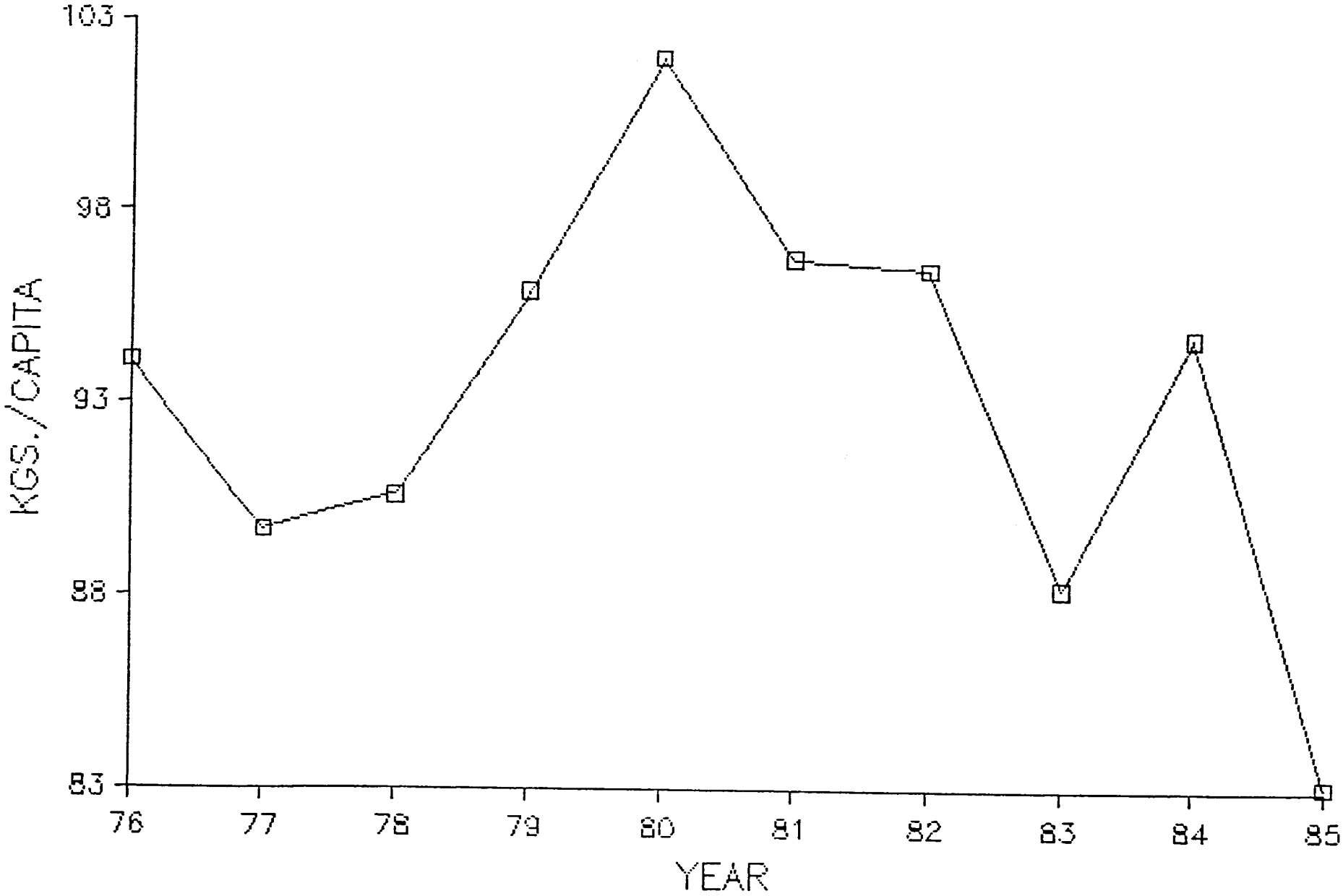


Figure 1.5

# RECENT RETAIL PRICE TRENDS (CURRENT PRICES)

## HAITI, 1984-1987

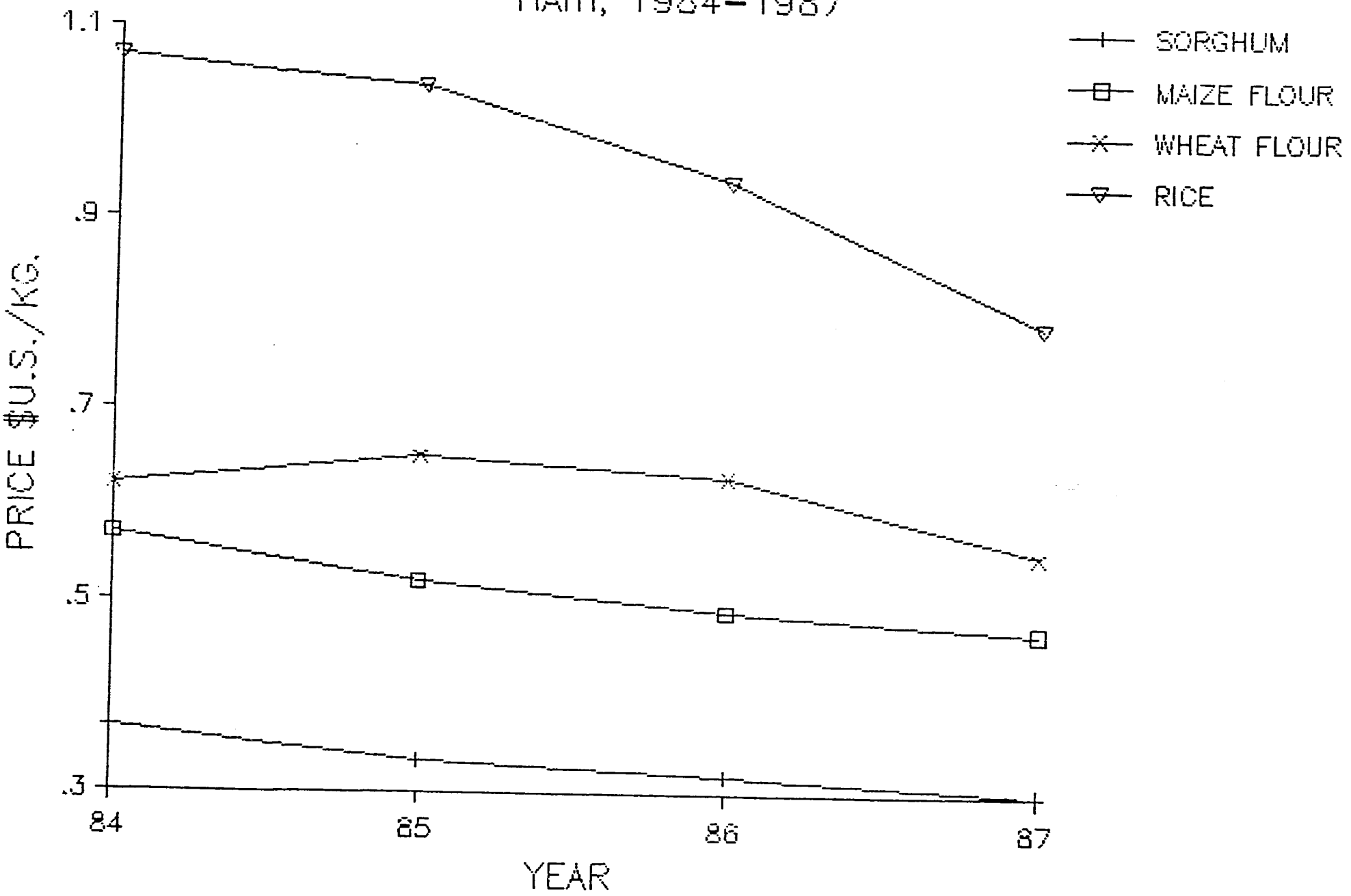


Figure 1.6

# CASH CROP PRODUCTION TRENDS
## HAITI, 1976-1985

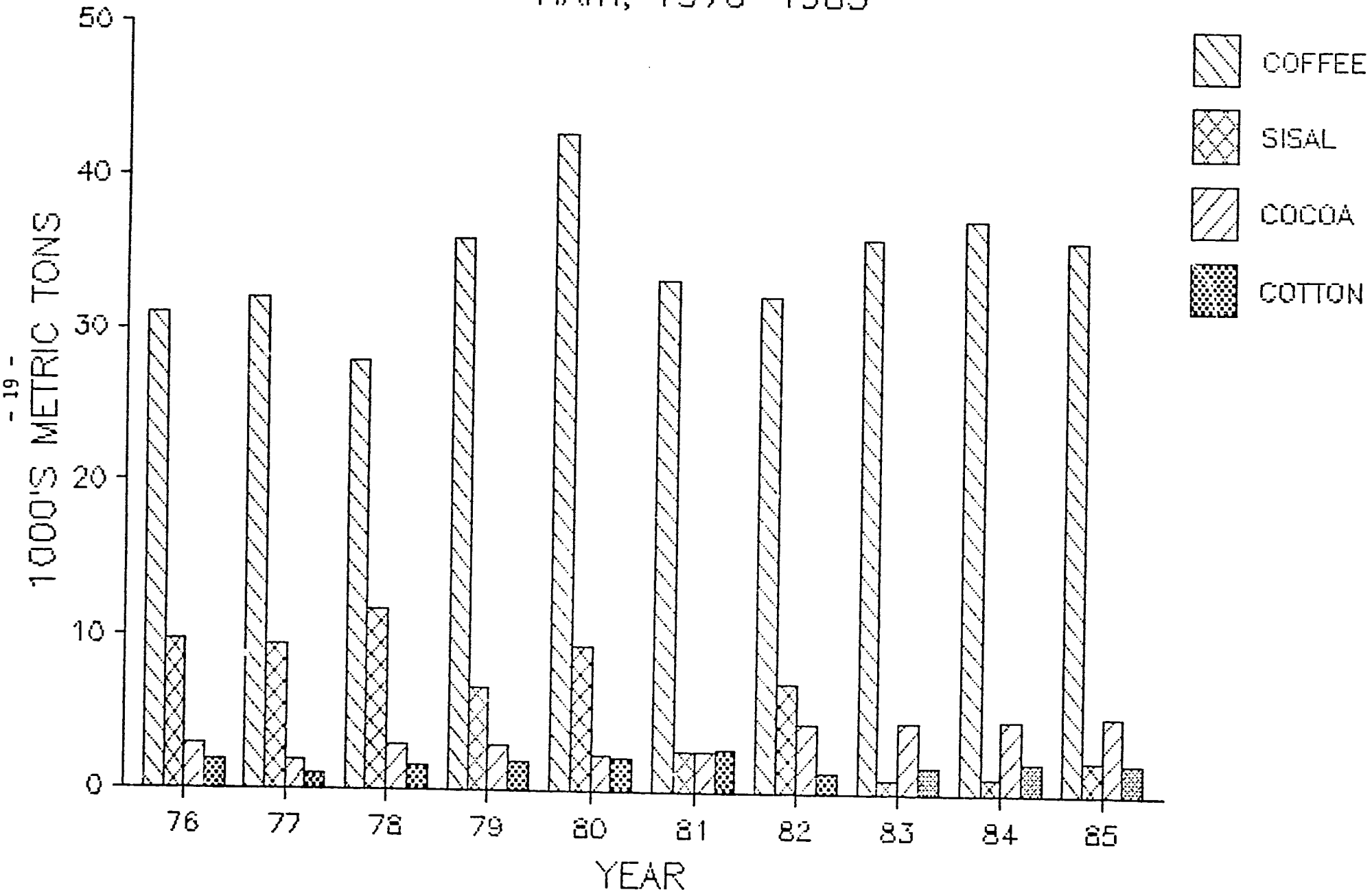
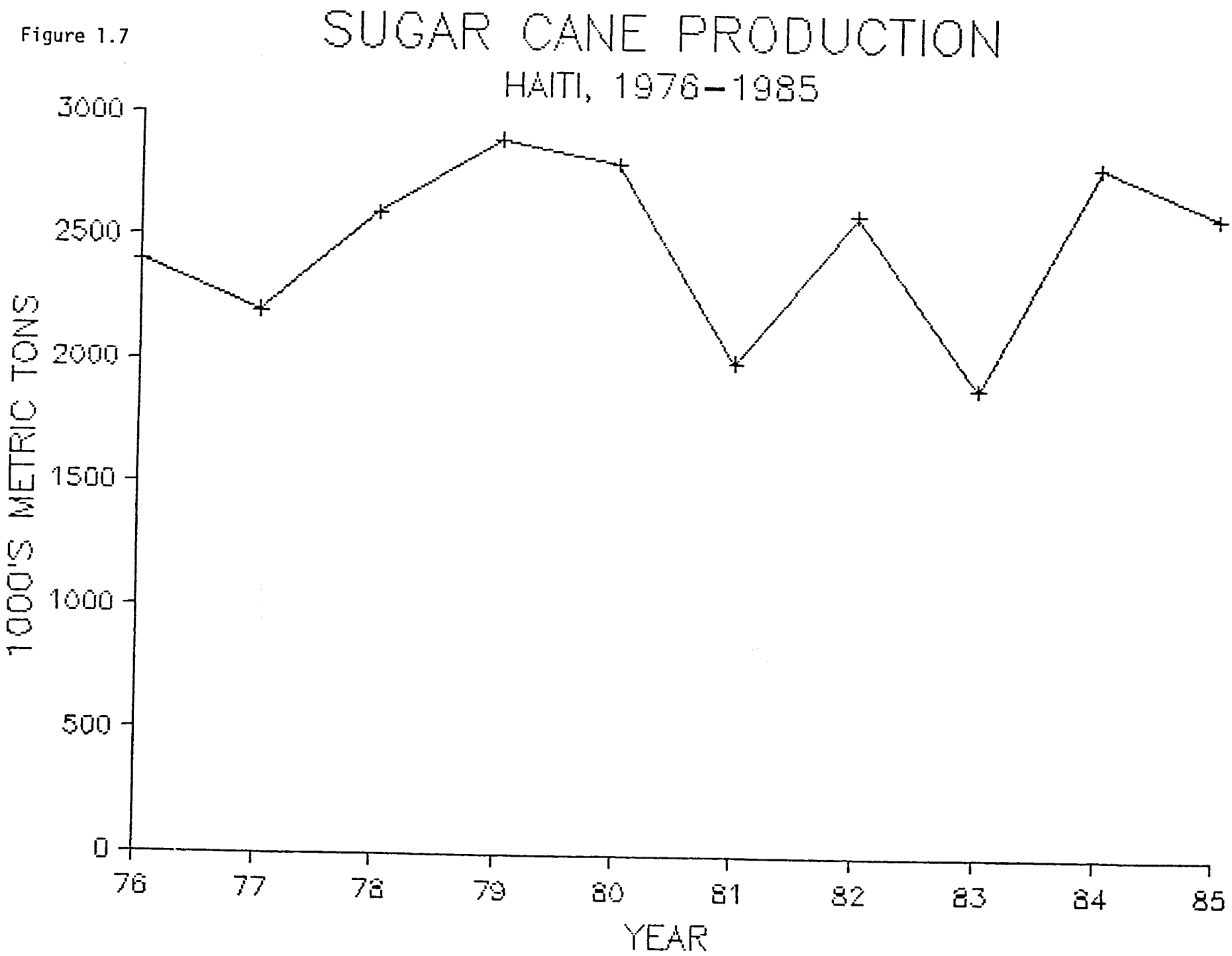


Figure 1.7


SUGAR CANE PRODUCTION
HAITI, 1976-1985
1000'S METRIC TONS
3000
2500
2000
1500
1000
500
0
76
77
78
79
80
81
82
83
84
85
YEAR

throughout the country. Production estimates have been widely disputed (see Agricultural sector assessment) and more reliable estimates forthcoming may help clarify the status of sugar cane production.

Figures for the number of coffee producers and the levels of production are just as uncertain as for sugar cane. Data on cocoa, on the other hand, appear to be more widely accepted. Cocoa is more concentrated in the southern departments with approximately 11,820 hectares planted in cocoa in the south, mostly in Grande-Anse. In spite of the increased production levels over the past decade, local informants indicate that cocoa has not experienced the adoption of new technologies, though data on technology adoption was not obtained to confirm this.

# II. FOOD CONSUMPTION AND NUTRITION IN HAITI

This section estimates the caloric needs of the Haitian people. A population profile is used to adjust the needed caloric intake by age and sex composition. A review of food consumption preferences and nutrition problems identifies important factors in determining the commodity mix. A careful review of past studies of Haiti and other literature is used to estimate alternative dimensions of caloric needs by geographic regions and by special demographic characteristics of the population, including variations by income levels.

The needs of the population are then compared to available calories provided from domestic production and imports, so that a food balance for the country can be determined. Any gap (needs minus availabilities) emerging from these calculations, provides a basis for establishing food aid program levels, designing targeted nutrition projects, and recommending agricultural development strategies to meet food needs.

## A. Population Estimates and Demographic Profile

Population growth rates vary by age and sex. These variations may cause significantly different patterns of food demand. Table 2.1 provides a profile of Haiti's population by sex and age groupings with projections for each group through 1993.

## B. Caloric Requirements by Age and Sex Categories

In order to accurately estimate the need for food in Haiti, estimates of food needs were made by adjusting for age and sex proportions of the population. Table 2.2 reveals the Recommended Daily Allowance for the Caribbean (RDAC) requirements for a range of age and sex groupings for energy. The total population in each group and the proportion of the total population represented by each group is calculated, so that the calories needed can be weighted by the proportion of the population which demands that number of calories. For example, children less than one year of age require only 820 calories and compose three percent of the population. Multiplying the RDAC for each group by the weighted proportion of the population reveals that average caloric requirements for the population are 2270 per day.

This estimate is based on the assumption of moderate activity for people above 13 years of age. Many people in the work force will require substantially higher levels of caloric intake and inactive persons will require less. The figure of 2270 would appear to be a conservative estimate of caloric needs in the country. Moreover, it is recognized that an adequate diet requires more than simply an adequate number of calories. Adequate protein, vitamins and minerals are essential to good health.

TABLE 2.1

POPULATION PROFILE (1971 - 1985) AND PROJECTION (1986 - 1990) HAITI

| | TOTAL | MALE | FEMALE | TOTAL AGE 0 - 14 | TOTAL AGE 15 - 64 | TOTAL AGE 65&+ |
|---|---|---|---|---|---|---|
| | TEN-YEAR ANNUAL GROWTH RATE FOR 1976 TO 1985 % | | | | | |
| | (1.6) | (1.5) | (1.6) | (0.9) | (2.1) | (1.7) |
| 1971 | 4,303,000 | 2,107,486 | 2,195,514 | 1,851,209 | 2,292,050 | 159,741 |
| 1972 | 4,371,000 | 2,140,978 | 2,230,022 | 1,884,676 | 2,324,876 | 161,449 |
| 1973 | 4,441,000 | 2,175,455 | 2,265,252 | 1,919,112 | 2,358,683 | 163,205 |
| 1974 | 4,512,000 | 2,210,429 | 2,301,571 | 1,954,092 | 2,392,937 | 164,972 |
| 1975 | 4,584,000 | 2,227,000 | 2,357,000 | 1,989,199 | 2,427,934 | 166,866 |
| 1976 | 4,660,000 | 2,282,826 | 2,383,174 | 2,026,684 | 2,470,264 | 169,051 |
| 1977 | 4,749,000 | 2,320,128 | 2,428,872 | 2,064,209 | 2,513,427 | 171,365 |
| 1978 | 4,834,000 | 2,358,290 | 2.475,710 | 2,102,621 | 2,557,655 | 173,724 |
| 1979 | 4,921,000 | 2,397,308 | 2,523,692 | 2,141,919 | 2,602,950 | 176,130 |
| 1980 | 5,009,000 | 2,436,486 | 2,572,514 | 2,181,665 | 2,648,788 | 178,547 |
| 1981 | 5,095,000 | 2,482,696 | 2,621,304 | 2,190,918 | 2,729,812 | 183,270 |
| 1982 | 5,182,000 | 2,529,879 | 2,671,121 | 2,200,905 | 2,812,061 | 188,034 |
| 1983 | 5,270,000 | 2,561,455* | 2,708,545* | 2,207,742* | 2,895,500 | 190,716* |
| 1984 | 5,361,000 | 2,603,955* | 2,757,045* | 2,211,161* | 2,951,228* | 193,436 |
| 1985 | 5,451,000 | 2,659,600 | 2,792,800 | 2,214,579 | 3,037,213 | 200,608 |
| 1986 | 5,554,000 | 2,700,540 | 2,837,460 | 2,234,430 | 3,100,619 | 204,071 |
| 1987 | 5,566,000 | 2,742,111 | 2,822,814 | 2,254,199 | 3,165,349 | 207,594 |
| 1988 | 5,713,000 | 2,784,322 | 2,928,904 | 2,274,274 | 3,231,431 | 211,177 |
| 1989 | 5,803,000 | 2,827,182 | 2,975,730 | 2,294,527 | 3,298,891 | 214,823 |
| 1990 | 5,894,000 | 2,870,702 | 3,023,304 | 2,314,961 | 3,367,760 | 218,531 |
| 1991 | 5,987,000 | 2,914,892 | 3,071,640 | 2,335,577 | 3,438,067 | 222,304 |
| 1992 | 6,081,000 | 2,959,762 | 3,120,748 | 2,356,377 | 3,509,842 | 226,141 |
| 1993 | 6,176,000 | 3,005,323 | 3,170,642 | 2,377,362 | 3,583,115 | 230,045 |

Source: World Bank

*Estimated using 1985 actual figure

TABLE 2.1 (continued) POPULATION PROFILE (1971 - 1985) AND PROJECTION (186 - 1990)

Haiti 1986

| | MALE AGE 0 - 14 | MALE AGE 15 - 64 | MALE AGE 65 & OVER | FEMALE AGE 0 - 14 | FEMALE AGE 15 - 64 | FEMALE AGE 65 & OVER |
|---|---|---|---|---|---|---|
| | (0.9) | (2.0) | (1.5) | (0.9) | (2.1) | 1.9) |
| 1971 | 931,442 | 1,104,625 | 71,419 | 919,767 | 1,187,425 | 88,322 |
| 1972 | 947,990 | 1,120,788 | 72,199 | 936,686 | 1,204,087 | 89,249 |
| 1973 | 965,014 | 1,137,440 | 73,001 | 954,098 | 1,221,243 | 90,203 |
| 1974 | 982,298 | 1,154,323 | 73,809 | 971,795 | 1,238,615 | 91,163 |
| 1975 | 991,428 | 1,161,580 | 73,993 | 997,771 | 1,266,355 | 92,874 |
| 1976 | 1,016,673 | 1,190,572 | 75,580 | 1,010,011 | 1,279,692 | 93,471 |
| 1977 | 1,033,664 | 1,209,921 | 76,543 | 1,030,545 | 1,303,506 | 94,821 |
| 1978 | 1,051,029 | 1,229,737 | 77,525 | 1,051,592 | 1,327,918 | 96,200 |
| 1979 | 1,068,765 | 1,250,019 | 78,524 | 1,073,155 | 1,352,951 | 97,606 |
| 1980 | 1,086,562 | 1,270,466 | 79,519 | 1,095,104 | 1,378,382 | 99,027 |
| 1981 | 1,092,209 | 1,309,222 | 81,266 | 1,098,709 | 1,420,591 | 102,004 |
| 1982 | 1,098,180 | 1,348,685 | 83,016 | 1,102,725 | 1,463,378 | 105,018 |
| 1983 | 1,107,937 | 1,376,592* | 84,260* | 1,112,569* | 1,494,176* | 107,021* |
| 1984 | 1,117,781 | 1,405,079* | 85,522* | 1,122,500* | 1,525,624* | 109,062* |
| 1985 | 1,110,700 | 1,461,200 | 87,700 | 1,103,879 | 1,576,013 | 112,908 |
| 1986 | 1,120,508 | 1,491,438 | 89,014 | 1,113,733 | 1,609,182 | 115,061 |
| 1987 | 1,130,524 | 1,522,301 | 90,348 | 1,123,675 | 1,643,050 | 117,256 |
| 1988 | 1,140,569 | 1,553,805 | 91,702 | 1,133,705 | 1,677,630 | 119,492 |
| 1989 | 1,150,702 | 1,585,957 | 93,076 | 1,143,825 | 1,712,938 | 121,771 |
| 1990 | 1,160,926 | 1,618,776 | 94,470 | 1,154,036 | 1,748,989 | 124,093 |
| 1991 | 1,171,240 | 1,652,274 | 95,886 | 1,164,337 | 1,786,151 | 126,460 |
| 1992 | 1,181,647 | 1,686,466 | 97,323 | 1,174,730 | 1,800,000 | 128,872 |
| 1993 | 1,192,145 | 1,721,365 | 98,781 | 1,185,217 | 1,834,498 | 131,330 |

* Estimated using 1985 actual figure

TABLE 2.2 RECOMMENDED CALORIC INTAKES BY POPULATION AGE GROUPS AND SEX

| Age Groups (Yrs.) | Sex: (M/F) | RDAC(1) (Cals.) | % of Population (2) | Weighted Proportions |
|---|---|---|---|---|
| <1 | (M/F) | 820 | 3.0% | .029 |
| 1 - 4 | (M/F) | 1595 | 11.5% | .116 |
| 5 - 9 | (M/F) | 2010 | 13.3% | .113 |
| 10-14 | (M) | 2750 | 5.7% | .057 |
| | (F) | 2420 | 5.7% | .057 |
| 15-19 | (M) | 2985 | 5.0% | .050 |
| | (F) | 2400 | 5.1% | .051 |
| 20-39 | (M) | 3000 | 13.0% | .129 |
| | (F) | 2200 | 14.9% | .149 |
| 40-49 | (M) | 2850 | 4.3% | .043 |
| | (F) | 2090 | 5.1% | .051 |
| 50-59 | (M) | 2700 | 2.8% | .028 |
| | (F) | 1980 | 2.3% | .023 |
| 60-69 | (M) | 2400 | 2.0% | .020 |
| | (F) | 1760 | 2.0% | .020 |
| 70 + | (M) | 2100 | 2.0% | .020 |
| | (F) | 1540 | 2.3% | .023 |

$E_{wt}$ = 2270.4 (weighted average energy requirement)

(1) Recommended Dietary Allowances for the Caribbeans, Caribbean Food and Nutrition Institute, Kingston, Jamaica, 1979.

(2) Adapted from: La Structure par Age et Sexe, Division d'Analyse et de Recherche Demographiques, Port-au-Prince, Haiti, 1982.

(3) Note

Recommended energy allowances have been based on moderate activity levels. For lighter or heavier work, adjustments should be made for the various age and sex groups from 13 yeras onward:

| Activity | Percentage Adjustment |
|---|---|
| Light | 90 |
| Very Active | 117 |
| Exceptionnaly Active | 134 |

## C. Nutrition Problems

Nutritional status is an important indicator of the well-being of a nation because it takes into account health, food consumption and other practices and can be quantitatively measured for specific age and demographic groups.

Generally, the most nutritionally vulnerable members of society, pregnant and lactating women and children under six years of age, are assessed to determine their nutritional status. Within the household, they tend to receive a disproportionately small share of food and so assessing their nutritional status and monitoring it over time may indicate when sufficient changes have been made in food and socio-economic systems to reach the most disadvantaged members of the population.

The most prevalent nutrition problem in Haiti is protein calorie malnutrition. The most comprehensive information on nutritional status and feeding practices was gathered in the National Nutrition Survey in 1978 (USAID, 1979). Since that time, per capita availability of calories has not changed significantly nor has per capita income, and in some instances it may have worsened. As such, it is anticipated that the 1978 survey results still provide a relevant indication of what the major food consumption and nutrition problems are.

### 1. Protein Energy Malnutrition

In 1978, the national survey results indicated the following levels of malnutrition:

Table 2.3.
Percentage distribution of preschool children by degree of malnutrition (Gomez classes) and geographical area: Haiti 1978

| Geographical area(a) | Gomez classes(b) 3rd: 60.0(c) | 2nd: 60.0-74.9 | 1st: 75.0-89.9 | Normal: 90.0+ | Total No. of children surveyed |
|---|---|---|---|---|---|
| Northwest | 3.0 | 22.8 | 48.8 | 25.4 | 891 |
| North | 5.7 | 28.5 | 46.2 | 19.6 | 892 |
| Artibonite | 2.5 | 28.3 | 45.4 | 23.7 | 889 |
| West | 2.7 | 23.4 | 47.2 | 26.8 | 895 |
| South | 3.6 | 25.9 | 46.0 | 24.5 | 893 |
| Representative rural sample | 3.5 | 26.0 | 46.4 | 24.1 | 4460 |
| Metropolitan Port-au-Prince | 1.5 | 13.1 | 43.8 | 41.7 | 893 |
| Representative national sample | 3.? | 24.1 | 46.0 | 26.8 | 5352 |
| Special group | - | 0.5 | 15.1 | 84.4 | 730 |

(a) All percentages with the exception of the special group are weighted by universe population proportions.
(b) In terms of percentage of National Center for Health Statistics/Center for Disease Control reference median weight for age. (The Gomez classifications of 1st, 2nd, and 34d degree malnutrition are based on the percent of standard of weight for age with the percentages for each of the three categories listed above. - author's note)
(c) Children identified as having pedal oedema were not automatically classified as third degree malnutrition.

Source: Graitcher et al 1980, p. 757.

Children who are in the third degree of malnutrition category require priority medical attention and/or immediate nutritional rehabilitation. If the children in the second degree category are added with those in the third degree, the estimated number of malnourished children reached 200,000 in 1978, fully 10 percent of the population of children.

## 2. Prevalence of Nutrition Problems and Trends

### a. Estimated Numbers of Malnourished Children

Using the proportion of malnourished children in 1978 as a basis to estimate levels of malnutrition using 1986 and 1991 population estimates, it can be seen that malnutrition will continue to be a major problem. Table 2.4 indicates that by 1991 the estimated number will reach 259,800. Although catch up growth will occur for many malnourished children who are rehabilitated, irreversible losses in mental development are an important loss in human capital.

### b. Estimated Number of Women at Risk

Women tend to be nutritionally vulnerable because of their low status in the food chain and child bearing and rearing responsibilities. Table 2.5 illustrates the categories of women that are typically at risk. The 10-19 year old group has high nutrient needs for growth while pregnant and nursing women have high needs due to the child. Table 2.5 indicates 1,629,900 women in 1986 and 1,808,100 in 1991 are estimated to be malnourished.

Table 2.4

PROJECTIONS OF THE NUMBER OF PRESCHOOL CHILDREN
SUSCEPTIBLE TO MALNUTRITION
by Geographic Region, Urban/Rural and National Levels
(Weight for age, II & III degree-Gomez Standard 1986-1991)

| Geographic Regions | Total of Preschoolers (in thousands) | | Percent of Malnourished Preschoolers in 1978 | | Estimated Number of Malnourished Preschoolers (in thousands) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1986 | | | 1991 | | |
| | 1986 | 1991 | III degree | II degree | Total | III degree | II degree | Total | III degree | II degree |
| North-West | 40,4 | 44,8 | 3.0 | 22.8 | 10,5 | 1.2 | 9.3 | 11,5 | 1.3 | 10.2 |
| North | 123,7 | 137,2 | 5.7 | 28.5 | 42,4 | 7.1 | 35.3 | 47,1 | 7.9 | 39.2 |
| Artibonite | 149,4 | 165,8 | 2.5 | 28.3 | 46,1 | 3.8 | 42.3 | 51,2 | 4.2 | 47.0 |
| West | 213,0 | 236,3 | 2.7 | 23.4 | 55,8 | 5.9 | 49.9 | 61,9 | 6.5 | 55.4 |
| South | 184,6 | 204,8 | 3.6 | 25.9 | 54,6 | 6.7 | 47.9 | 60,5 | 7.5 | 53.1 |
| Rural Total | 711,1 | 788,9 | 3.5 | 26.0 | 209,4 | 24.7 | 184.7 | 232,2 | 27.3 | 204.9 |
| P-au-Prince | 79,9 | 88,6 | 1.5 | 13.1 | 11,7 | 1.2 | 10.5 | 12,9 | 1.3 | 11.6 |
| National Total | 858,8 | 952,8 | 3.2 | 24.1 | 234,5 | 27.5 | 207.0 | 259,8 | 30.4 | 229.4 |

Source: - Enquete Nationale sur l'Etat Nutritionnel-Haiti-Bureau de Nutrition-DSPP et AID, 1978.
- DIFPAN, 1980.

Table 2.5
Groups of Nutritionally Vulnerable Women

| Physiological State | Age Group | %* | Year 1986 (in thousands of persons) | 1991 |
|---|---|---|---|---|
| Women | 10-19 | 10.9 | 615,9 | 683,2 |
| Pregnant Women | 15-19 | .7 | 37,4 | 41,5 |
| Breast Feeding Women | 15-19 | .3 | 18,7 | 20,7 |
| Women | 20-44 | 12.0 | 677,4 | 751,4 |
| Pregnant Women | 20-44 | 3.3 | 187,0 | 207,5 |
| Breast Feeding Women | 20-44 | 1.7 | 93,5 | 103,8 |
| TOTAL** | | | 1629,9 | 1808,1 |

Source: IHS, DHF-DSPP, DIFPAN, 1980.

*Percent of total population

**Added by author

Modified from DIFPAN, 1980 - Secretairerie D'Etat DuPlan groupe Technique Intersectoriel pour la formulation de Politiques Alimentaires et Nutritionnelles (DIFPAN), Bases et Propositions Pour Une Politique Nationale D'Alimentation Et De Nutrition, aout, 1980.

### 3. Other Nutritional Problems

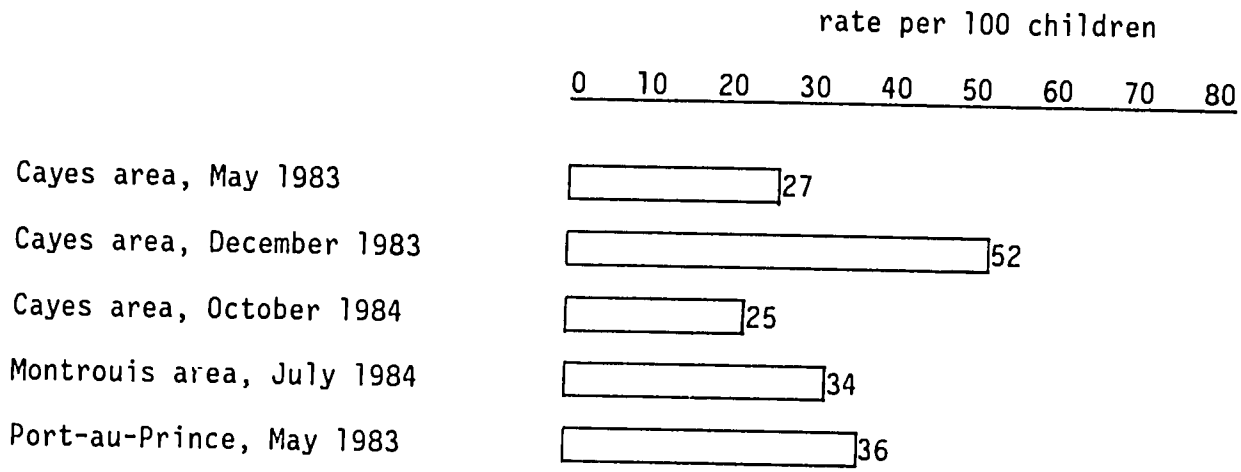
In addition to protein-calorie malnutrition, other important nutritional problems include lack of iron, Vitamin A and riboflavin in the diet. These are important problems mentioned in several studies (USAID, 1979, Smith, et al. 1983; Beghin, et al., 1970) and a review of studies (Israel, et al. 1982). However, these nutritional problems deserve less attention when there is not sufficient food to provide necessary calories and protein. Typically food aid commodities will provide mainly calories, and some protein, Vitamin A (fortified NFDM, oil) and riboflavin (NFDM) and depending on the type of legume, some iron.

### 4. Incidence of Infection

The 1978 survey also showed very high percentages of preschool children in rural areas suffering from general "illness" and/or diarrhea at a given point in time. A startling 54% of rural preschool children were reported by their mothers as "sick" and 44% of them had diarrhea during the week prior to the survey; 32% of the children had a fever.

From a more recent (1983 and 1984) but smaller sample (Pierre Louis, 1986) from 25-52 percent of the children had suffered from diarrhea as seen in Table 2.6. There were dramatic seasonal differences. The prevalence of diarrhea in Cayes was almost 50 percent less in May of 1983 than it was in December of that same year. Together with the 1978 data, these suggest that diarrhea is a real problem with seasonal variations.

Table 2.6. Prevalence of diarrhea previous week and previous two weeks in selected child population groups ages 0 to 4 years, 1983-1984.




Source: (Pierre Louis, 1986)

Acute malnutrition problems are correlated with illness and disease - especially fever and diarrhea. From the information available it is not possible to tell whether the children are sick because they are malnourished or if they are malnourished because they are sick. It is clear, however, that acute malnutrition exacerbates illness and diarrhea, and vice-versa.

Reported deaths in this age group are most frequently attributed to diarrhea and respiratory infections. However, based on experience in other developing countries and on the severity of the malnutrition problem in Haiti, it is probable that the underlying cause in a great proportion of cases is malnutrition.

## 5. Nutritional Status Differences by Key Demographic Groups

### a. Geographical Differences

The major differences in nutritional status are evident between rural and urban areas, with Port-au-Prince being the major urban area. Table 2.3 shows that second and third degree malnutrition was roughly twice as high in rural areas (National Nutrition Survey, USAID, 1979).

However, the differences in nutritional status between rural areas appear to be slight. During times of drought in the Northwest, higher rates are reported; and with decreased production in the North, higher rates of malnutrition may be assumed. The North had the highest rate of malnutrition overall of the regions and the highest rate of the moderate and severe categories of malnutrition. More differences among regions are noted in food consumption practices than in nutritional status.

With increased migration to Port-au-Prince and high rates of unemployment, the lower income urban groups may be more comparable to rural groups. In 1981, disadvantaged Port-au-Prince families had higher rates of malnutrition when compared with overall national averages from the 1978 National Nutrition Survey (Berggren, 1981).

### 6. Implications for Food Aid

The major nutrition problem is lack of food or calories. When adequate calories are available in the diet then it is likely that many nutrients will be found in acceptable amounts for adequate nutrition (with the possible exception pf pregnant and lactating women and growing children). In Haiti, pregnant and lactating women and children 12-23 months of age are at highest nutritional risk.

The most vulnerable groups according to geographical differences appear to be rural areas in the North and the very lowest income groups in Port-au-Prince although additional sources of data would be helpful to verify these conclusions. The food aid strategy should take into account the needs of the vulnerable groups and the significant boost in overall calories needed by the population.

## D. FOOD CONSUMPTION

Food consumption data is important to the food gap analysis in providing data to describe food habits, calculate estimates of the percent of the diet provided by different commodities, monitor shifts in consumption patterns across time, and analyze geographic differences (rural/urban and regional). One of the apparent limitations is the lack of household food consumption and budget studies for the country over the last fifteen years.

### 1. Food Consumption of Young Children

An analysis of the food consumption practices of young children will help to identify the commodities most desirable for Title II programs and to identify socio-cultural aspects of food use which may influence how efficiently the foods are used.

The most comprehensive study of food consumption practices of children was completed in 1978, using a subsample of the National Nutrition Survey (USAID, 1979). It is anticipated some changes in foods consumed may have

occurred, but for the most part, many of the consumption habits have most likely remained the same. The dietary survey was based on a national sample of 1064 children in 150 communities. Data were gathered on food production, availability and consumption, and compared across location, age, and categories of foods consumed.

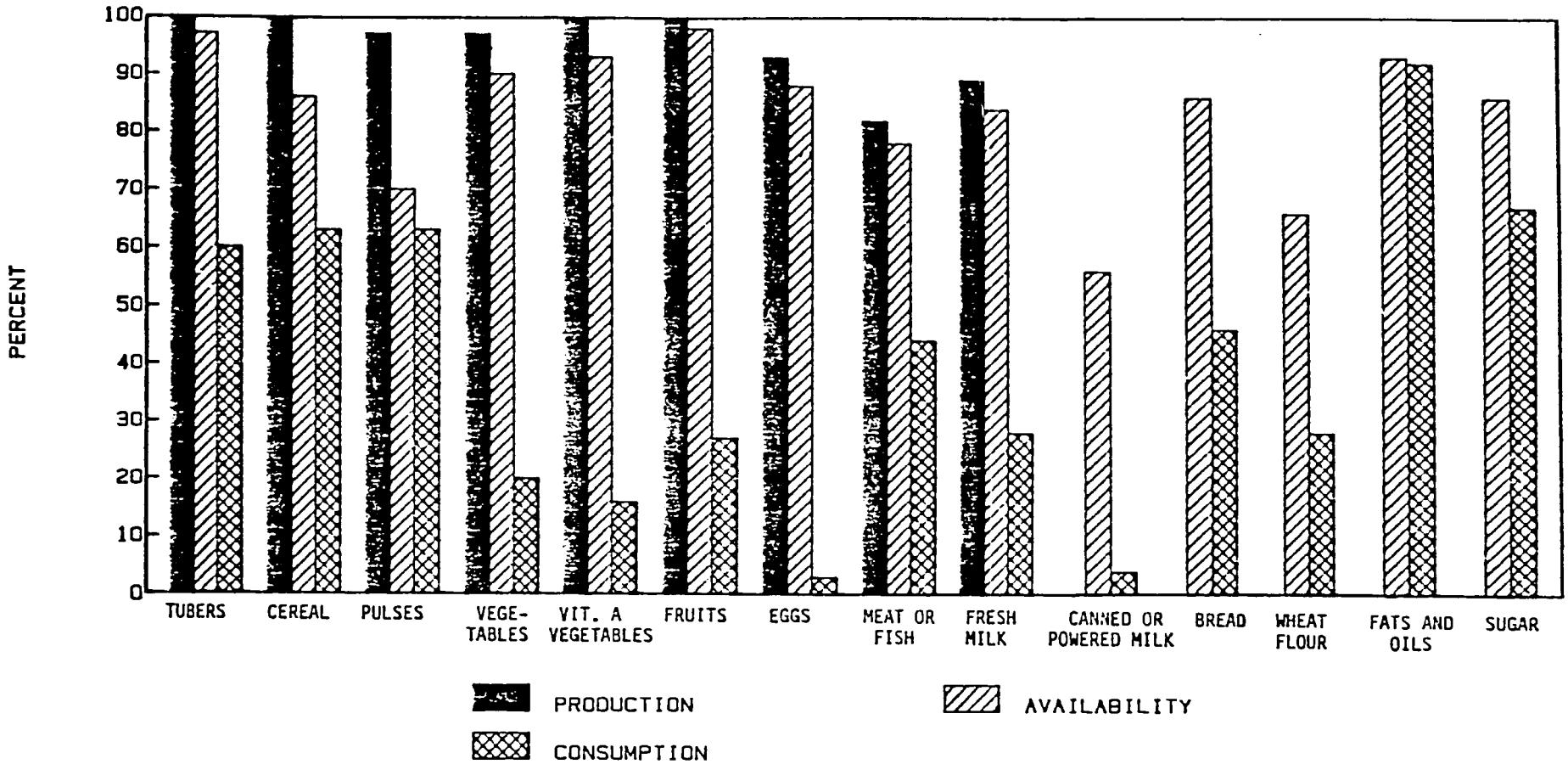
An overview of what foods are produced and how availabile they are in the communities adds an important dimension to understanding the food consumption practices (Figure 2.1). Practically every rural community produced at least one type of food within each of the fresh food categories. All of the communities produce some kind of tubers, cereals, fruits and vegetables containing Vitamin A. 97% produced pulses, 92% produced eggs, 89% had milk cows and 82% slaughtered animals at least once per week for fresh meat. Within the categories of foods, certain crops were produced much more frequently than others and some regional differences did exist. Corn was produced by every sample community in all regions except for 7% of the Artibonite communities. The most popular tubers (by nearly 100% of the communities) were sweet potato and bitter manioc. Dark green leaves and winter squashes (both with high Vitamin A content) were the most popular vegetables. Okra and tomatoes were produced by 80% of the communities in each region. Mangoes were found in all communities and other fruits like avocado, guava, banana and papaya were grown by 80 to 100% of the communities. Peanuts were an important crop in only the Northwest. The survey was conducted in a good agricultural year during the harvest season. There was little variation from one region to another in the availability of food. From this analysis, it is evident that a sufficient variety of foods are produced in each region to promote adequate nutrition. This study did not determine whether levels of production were sufficient to meet nutritional needs. Because of the high rates of malnutrition at the time of the food consumption study, it is assumed that low production, along with other factors, would contribute to the high levels of malnutrion.

The most marked differences in food consumption were found between rural and urban groups. Cereals, tubers and fresh milk were consumed by fewer children in urban than in rural areas. Rice, bread, meat, sugar, carrots, canned or powdered milk, and flour were consumed more by urban children than rural children. Rural children ate more corn, green leafy vegetables or squash, and mangoes. Vegetable oils and fruits were consumed at similar levels in both rural and urban areas. In this particular study, the number of urban children consuming foods from a majority of food categories was larger than the number from the total rural sample. Few other household food consumption surveys have been conducted. When the USAID Household Economics and Consumption Survey (HECS) is completed, the consumption information for the different regions may be amplified.

## 2. Other Key Food Habits

The dietary study (USAID, 1979) covered other important feeding areas. Some of the results that have direct implications for targeted feeding are the following:

Figure 2.1 Percent of rural communities that produce a food, percent in which it is available at the time of the survey, and percent of children in the rural universe that consume the food.




Source: 1978 Dietary Survey, U.S.A.I.D. p. 37.

- o Supplementary foods are given to breast fed children in the form of soup or "bouillie" with 75% receiving it before three months of age. Between three and five months, 50% to 60% received corn meal and bean sauce. The soup is usually boiled bread with sugar and the "bouillie" is flour (usually wheat, rice, potato, starch, plantain or corn) and water with sugar. The traditional weaning foods of corn meal and bean sauce are more nutritious than the soup.

- o For all foods except sugar, wheat flour and milk, as children get older, they eat more different types of foods. The amount of bread that both urban and rural children eat plateaus at two years of age, indicating the importance of bread for children before weaning is completed. The same is true for tubers, fruits, and vegetables for urban children.

- o On the average, urban children are weaned at 12 months of age, and rural children at 18 months of age. With earlier weaning, it is critical that adequate weaning foods be used to replace breast feeding.

- o Overall, 42% of the children had nothing that qualified as a meal during the day and 54% had one meal during the day [meal is considered a combination of foods such as cereals and pulses or tubers and legumes (or meat), based on traditional Haitian meal patterns]. More urban children had 1 or 2 meals per day than rural children and fewer had no meals. Practically the only children who consumed two meals per day were two years of age and older. For children less than 2 years of age, eating foods in combinations that would constitute a meal would increase the nutritional efficiency of the food consumed. If the analysis for meals had been done by age category, it would be possible to determine if the high percentage of children not consuming meals is due to the 3-11 month old children's food patterns that typically would not constitute a meal. There is some correlation with poorer nutritional status and no meals.

- o The quality of meals consumed or foods combined is poor. Sixty three percent of the children eat cereals for a main meal. One-half of these eat the cereals with pulses while only 20-40% of these children eat cereals with animal products as well as pulses. There was sufficient data to determine whether it is a lack of money or a cultural perception that limits the use of pulses and animal products with cereals.

- o The twelve to twenty-three month old children had higher rates of malnutrition (identified in the National Nutrition Survey) but their weaning food patterns do not seem to be so deficient to cause such high rates of malnutrition. Perhaps if more information was available on amounts of food or the number of times the child is fed, and some rates of infection, the higher rates of malnutrition could be explained. Although the kinds of weaning foods may be nutritionally appropriate, they may be given in too small amounts or in less efficient combinations to children whose high rates of diarrhea prevent them from taking full advantage of the food eaten. A review of the interactions of malnutrition and diarrhea (Leslie, 1987) shows that diarrhea is related to children's losing weight and that malnourished children have more frequent and severe episodes of diarrhea.

- o Vitamin A consumption is low and with the practices identified in this study at that particular point in time, neither bread nor sugar were possible vehicles for supplementation with Vitamin A. Bread products did not adequately penetrate rural areas and the majority of rural households used a less refined sugar.

3. Nutritional Status and Food Consumption

As would be expected, there are similarities in nutritional status and food consumption practices (USAID, 1979). Both nutritional status and food consumption are better for urban children than rural children, while children in different rural areas don't differ much from one another. In comparing food consumption and nutritional status, there is a tendency for more children with better nutritional status to consume each type of food with the exception of tea and coffee, because they are substituted for foods by the more malnourished children when food is scarce. The better nourished group of children are consuming more pulses, fresh milk and other vegetables. Higher consumption of expensive food items - fresh milk, certain vegetables, and pulses, may indicate that the better nourished children are from higher income groups.

4. Implications of Children's Food Habits and the Food Aid Strategy

The food aid strategy should be designed so that:

1. If increased amounts of flour and bread products are available through PL 480, they will not displace more nutritious traditional weaning foods.

2. The overall amount of food available to young children is increased and the combinations of foods improved for maximum nutritional efficiency (i.e. grains with legumes or tubers), especially for the 12-23 month age group.

3. Gains in nutritional status through increased food availability (through PL 480) will not be negated by a lack of parallel gains in reducing rates of diarrhea through improved sanitation and health conditions and oral rehydration therapy.

5. Acceptability/Use of Different PL 480 Foods

The traditional diet includes corn, rice, and beans as well as pulses and other fruits and vegetables. Milk is not widely consumed in rural areas. The use of NFDM in Title II programs will be acceptable since children under six years of age do not experience lactose intolerance which is prevalent among the adult population. Adults who lack sufficient lactose (an enzyme necessary for the metabolism of the milk sugar lactose) experience diarrhea, bloating, and nauseau if they consume much more than the equivalent of one glass of milk. Soybeans are not typically consumed and require longer cooking times (more fuel) than traditional beans. Peanuts would be culturally acceptable and a good source of calories and protein. The nutrient content of various PL 480 commodities is shown in

Appendix 2.3. During a school feeding visit, teachers mentioned that the corn soy mix was preferred over bulgur and they used a bean sauce to increase palatability.

## 6. Estimating Proportions of the Diet from Different Food Commodities

### a. Comparisons Across Time

The analysis (Table 2.7) includes several data sources to calculate the proportion of the diet derived from cereals and oils or other food aid commodities. In order to evaluate the likely proportion of the diet derived from cereals and oils the data from three of five available years were selected. Although more data were available as far back as 1970, it appeared that the 1980 data, seen in Table 2.7, had been extrapolated using the Beghin et al. 1970 study, so only the 1980 data were included.

Based on selected years between 1977 and 1983, cereals represent a range from 36 to 53 percent of the Haitian diet. The variation in levels for the different years is not easily explained by lower levels of production since 1980 was a high yield year for maize, and other cereals were plentiful as well. The percent of per capita calories supplied by oil ranges from 3 percent to 9 percent. Again, the levels of availability do not account for differences in the data. It would appear that these data are useful for providing rough estimates of consumption. If they are compared with selected years of food availability based on FAO data, the percent of per capita calories from cereals is from 42 percent to 46 percent and from 4.5 percent to 6.2 percent for oils which are comparable to the estimates shown in Table 2.7.

Table 2.7

VOLUME OF FOODS CONSUMED ON A PER CAPITA BASIS
for Selected Years

| FOODS | 1983[1] | | 1980[2] | | 1977[3] | |
|---|---|---|---|---|---|---|
| | Kg./Yr. | Kcal./Yr. | Kg./Yr. | Kcal./Yr. | Kg./Yr. | Kcal./Yr |
| Cereals | 93.8 | 332,896 | 63.0 | 223,587 | 101.7 | 360,933 |
| Roots, tubers | 88.7 | 131,776 | 69.4 | 64,403 | 45.4 | 42,131 |
| Sugar | 65.5 | 99,626 | 66.8 | 101,603 | 66.0 | 100,386 |
| Peas, Beans, Nuts* | 23.5 | 71,675 | 25.6 | 78,080 | 23.6 | 71,980 |
| Vegetables | 43.8 | 11,607 | 43.0 | 11,395 | 44.6 | 11,819 |
| Fruits | 121.5 | 40,095 | 45.5 | 48,015 | 119.7 | 39,501 |
| Meat | 12.5 | 20,125 | 8.0 | 12,880 | 12.1 | 19,481 |
| Eggs | 1.2 | 1,738 | .9 | 1,303 | 1.7 | 2,462 |
| Fish | 3.1 | 5,658 | 1.8 | 3,285 | 1.1 | 2,008 |
| Milk | 12.6 | 8,316 | 11.2 | 7,392 | 12.3 | 8,118 |
| Oils | 2.9 | 25,584 | 6.6 | 58,225 | 2.8 | 24,702 |
| Other | 21.9 | 6,570 | 10.6 | 3,180 | 12.9 | 3,870 |
| TOTAL | | 755,666 | | 613,348 | | 687,391 |
| Cereals as a % of Total | .44 | | .36 | | .53 | |
| Oils as a % of Total | .03 | | .09 | | .04 | |

*Mean calories for coconut and peanuts as nuts with mean for beans for total category.

Sources: (1) FAO Food Balance Sheet, 1983, (2 & 3) Ministry of Planning referenced in Agriculture Sector Assessment, 1987.

b. Regional Differences

The analysis of regional differences is based on limited studies of regional food availability due to the lack of household food consumption studies comparable across the regions. Regional differences in the availability of cereals as seen in Table 2.8 show that per capita availability of cereals was highest in the transversal area followed by the South, West, and North. When levels of available foods are compared against recommended levels for adequate nutrition (based on total caloric and protein needs), a more useful comparison between regions can be made as seen in Table 2.9. As would be expected from the former table, the North and West have the highest deficits in cereals. The Transversal region is the only region with a surplus of cereals. Even if an average amount of wheat (6 kg. per capita) were added to available cereals, there would still be deficits in all of the regions. Some of the deficit in cereals in the North may be nutritionally offset by the relatively higher availability of roots and tubers. The West is at a substantial disadvantage with deficits in both cereals and roots and tubers. Some of these deficits could be attributed to food habits different than those associated with the recommendations. Regardless of food habits, the low levels of cereals and roots and tubers without proportionately higher levels of other available foods indicates a potential problem unless it is compensated for through marketing. The sugar and syrup category contributes substantial calories to the diet. The sugar cane and sugar surplus of 468.3 kg. in the North provides substantial calories but it is assumed that most of the sugar or cane produced in the area is actually consumed elsewhere.

Regional differences in the availability of foods related to PL 480 can be reviewed based on the 150 communities surveyed in 1978. A higher percentage of communities in the Southern region had flour, oil, bread and canned or evaporated milk available than any other rural area (Table 2.10). Except for oil, the North had the next highest percentage of communities with the commodities available. The communities included from the Artibonite were at high elevations and relatively remote so that the availability of the commodities in these sample communities may not be representative of the area. The Northwest had the lowest percentage of communities with bread or oils and low numbers of communities with flour. From these regional differences it would appear that in 1978 the Southern region had more of the food aid type commodities available than other regions.

Table 2.8

PER CAPITA AVAILABILITY OF FOODS IN HAITI
IN 1984
(By Region)
(Finished Product in kg.)

| PRODUCTS | REGION | | | | NATIONAL |
|---|---|---|---|---|---|
| | North | Transversal | West | South | |
| Cereals | 35.4 | 96.6 | 40.0 | 59.6 | 58.7 |
| -Maize | 4.3 | 40.0 | 21.1 | 31.1 | 27.9 |
| -Rice | 7.3 | 28.4 | 1.0 | 4.7 | 10.1 |
| -Sorghum/Millet | 3.8 | 9.2 | 17.9 | 20.2 | 20.7 |
| Roots, Tubers, Bananas | 167.7 | 119.9 | 62.1 | 157.2 | 112.4 |
| -Roots & Tubers | 105.1 | 83.3 | 44.1 | 111.4 | 77.2 |
| -Bananas | 62.6 | 36.6 | 18.0 | 45.8 | 35.2 |
| Cane & Sugar | 817.4 | 241.5 | 361.2 | 222.1 | 369.0 |
| Peas & Beans | 22.3 | 17.8 | 12.0 | 17.0 | 16.1 |
| Nuts & Seeds | 6.3 | 2.7 | 4.1 | 8.4 | 4.9 |
| -Peanuts | 3.7 | 1.7 | 2.2 | 2.3 | 2.3 |
| -Coconut | 2.6 | 1.0 | 1.9 | 6.1 | 2.6 |
| Vegetables | ... | ... | ... | ... | 49.2 |
| Fruits | 141.9 | 68.4 | 38.5 | 90.4 | 72.3 |
| -Figs, Ripe Bananas | 15.0 | 6.9 | 5.5 | 14.3 | 9.0 |
| -Citrus fruit | 20.4 | 3.4 | 3.9 | 8.1 | 7.0 |
| -Mangoes | 58.5 | 35.1 | 15.6 | 36.0 | 31.3 |
| -Other | 48.0 | 23.0 | 13.5 | 32.3 | 25.0 |
| Meat | ... | ... | ... | ... | 5.0 |
| Fish | ... | ... | ... | ... | 1.3 |
| Eggs | 1.2 | 0.8 | 0.7 | 0.9 | 0.8 |
| Milk | 5.1 | 1.7 | 2.7 | 7.9 | 3.8 |
| Oils | ... | ... | ... | ... | 3.8 |
| Coffee, Cocoa | 8.9 | 4.0 | 4.8 | 14.0 | 7.0 |

Source: UPAN 1984

Table 2.9

PER CAPITA DEFICITS OR SURPLUSES OF REGIONAL FOOD SUPPLIES
IN RELATION TO RECOMMENDED CONSUMPTION LEVELS IN 1984
(Finished Product in Kg.)

| PRODUCT | REGION | | | | COUNTRY |
|---|---|---|---|---|---|
| | North | Transversal | West | South | |
| National Cereals | | | | | |
| Alternative III | | | | | |
| -Maize | - 12.7 | - 3.1 | - 15.9 | - 1.9 | - 9.1 |
| -Rice | - 8.9 | + 12.2 | - 15.2 | - 11.9 | - 6.1 |
| -Sorghum/Millet | - 20.5 | + 9.7 | - 6.4 | - 4.1 | - 3.6 |
| Total for Cereals | - 42.1 | + 18.8 | - 37.5 | - 17.9 | - 18.8 |
| Roots, Tubers, Bananas | + 61.7 | + 13.9 | -43.9 | +51.2 | + 6.4 |
| Sugar and Syrup | +468.3 | -107.6 | +12.1 | -127.0 | +19.9 |
| Peas, Beans | -- | -- | -- | -- | -- |
| Nuts & Seeds | - 3.3 | - 6.9 | - 5.5 | - 1.2 | - 4.7 |
| Vegetables | -- | -- | -- | -- | -- |
| Fruits | + 32.9 | - 40.6 | - 70.5 | - 18.6 | -36.7 |
| Meats | -- | -- | -- | -- | 5.0 |
| Fish | -- | -- | -- | -- | 2.0 |
| Eggs | - 1.8 | - 2.2 | - 2.3 | - 2.1 | - 2.2 |
| Milk | - 24.6 | - 28.0 | - 27.0 | - 21.8 | -25.9 |
| Oils and Fats | -- | -- | -- | -- | - 9.8 |
| Coffee, cocoa | + 5.9 | + 1.0 | + 1.8 | + 11.0 | + 4.0 |

Source: UPAN 1984
Sugar cane consumption is equivalent to 349.1 Kg. of sugar cane per capita, and per year

(Referenced in Agriculture Sector Assessment, 1987)

Table 2.10
Percent Communities by Region in Which Selected Industrialized and Semi-Industrialized Products with Commercial Distribution Were Available June - August 1978

| Region | COMMODITY AVAILABLE | | | |
|---|---|---|---|---|
| | Flour | Bread | Commercial Oils & Fats | Canned or Powdered Milk |
| Artibonite | 60 | 80 | 83 | 47 |
| South | 86 | 93 | 96 | 72 |
| North | 63 | 90 | 86 | 57 |
| West | 63 | 90 | 87 | 47 |
| Northwest | 60 | 77 | 83 | 57 |

Source: USAID 1979. Haiti Nutrition Status Survey 1978 Dietary Report, November 1979, Table 4, pg. 38.

Implications for food aid strategy

Although there are some limitations in comparing more recent food availability data with earlier nutrition studies, it is assumed that general patterns have remained constant and recommendations are made based on those patterns. The North has the highest deficits in cereals, the highest levels of malnutrition, and about average availability of food aid commodities. It is recommended that the food aid strategy account for the more serious needs in the North. The Artibonite has slightly better levels of nutrition and food availability but ranks second in levels of malnutrition. The Northwest, South, and West are very similar in levels of malnutrition although the South has proportionately more communities with food aid commodities available.

7. Food Consumption and Income

The lack of national household food consumption and expenditure data prior to the completion of the HECS study limits the discussion of the relationship of food consumption or nutrition to income in a comprehensive fashion. A preliminary review of available USAID documents gives some indications of the relationship between nutrition and income.

a. Income and Nutrition

From one study of 160 malnourished children, short-term nutrition problems were more closely associated with the availability of food,

amount of money spent on food and the mother's report of sufficient food money available. Although income was closely associated with the current nutritional status of the children, their long term nutritional status (as measured by height/age) was most strongly correlated with education variables. Factors such as steady income, absence of father in the home, and family size have also been associated with malnutrition.

Another study found the nutritional level of a low-income urban area lower than the national average. From the discussion on food consumption (Section II.C.3.b), it was noted that urban dwellers purchased more higher cost food items such as fresh milk, beans, and other vegetables.

b. Food Expenditures

Only one study was readily available that describes food expenditures in Haiti. An analysis of the Bloc Joanisse area (UPAN, 1984) includes information on the percent of household income spent for food. The percent ranges from 43.5 percent in Mapous to 68.9 percent in Achin as seen in Table 2.11. This proportion is similar to that common in other developing countries (Caliendo, 1979). Further analyses are needed to describe the relationship of expenditures with nutrition.

Table 2.11
Annual Income and Food Expenditures

| | PER HOUSEHOLD | | | |
|---|---|---|---|---|
| Location | Income (gourdes) | Food Expenditures (gourdes) | % | Per Capita Food Expenditures (gourdes) |
| Calasse | 2.833 | 1.694 | 59.8 | 297 |
| Joanisse | 3.960 | 2.020 | 51.0 | 297 |
| Mapous | 1.866 | .812 | 43.5 | 142 |
| Rigaud | 2.950 | 1.320 | 44.7 | 220 |
| Achin | 1.520 | 1.048 | 68.9 | 173 |
| Bois Blanc | 4.909 | 2.847 | 58.0 | 385 |
| TOTAL | 2.531 | 1.343 | 53.1 | 224 |

Source: UPAN, 1984.

Implications for Food Aid

With the limited amount of information available on income and nutrition, it is difficult to make any strong recommendations. From limited studies, it would seem important to consider food aid as a tool for improving children's nutrition over the short term while longer term gains would require more developmental approaches that improve women's income, access to resources, and education. There is sufficient evidence to indicate there are pockets of poverty in rural as well as urban areas that will have a higher need for food and and longer term developmental assistance.

8. Seasonality of Consumption

a. Seasonality and Nutrition

Very few studies provide information on seasonal fluctuations in food consumption or nutrition. The most notable study completed in 1968 (King et al., 1968) showed seasonal reductions in protein and calories in February and March as well as in riboflavin and calcium. However, data were only presented for one area, Les Cayes. Beghin et al. (1970) noted that lower levels of riboflavin were evident in winter than in summer because mangoes and avocadoes (major riboflavin source for the communities) are out of season in winter. As mentioned earlier, levels of infection in the population vary and may tend to complicate seasonal food shortages.

A preliminary review of Catholic Relief Services Maternal Child Health Programs suggests that the nutritional status of participants is quite sensitive to center closings. Higher numbers of moderately and severely malnourished children are found when centers open after vacation (mainly September and October).

b. Seasonal Food Gaps and Agricultural Production

It is assumed that the appropriate data to determine seasonal availability of food supplies at the household level will be available with the completion of the Agricultural Data Survey. An estimated 80 percent of the rural population is involved in agricultural production and it will be important to determine their periods of food/income shortages. The small-scale producers and landless are the most at risk to seasonal shortages and should receive additional consideration in the food aid strategy. Based on other studies in the tropics (Chambers, et al., 1981), because labor needs, rates of infection, and stocks of food vary throughout the year, the longer term food aid development strategy must go beyond just improving the supply of food if real gains in nutritional status are to occur.

Additional research is needed to determine the interrelationships between livestock production and household nutrition. Will development of the meat industry stimulate more grain production? Will these developments improve household nutrition? Attention should also be given to the effect of price increases for export crops on the availability of food consumption. Cyclical patterns of crop production and the efficiency of markets will be important factors determining food security at the household and community levels.

## E. Estimates of Food Gaps

Food gap estimates require measurement of national food needs of the population, availability of food from domestic production and normal levels of imports including any food aid. In the previous section, it was determined that an appropriate per capita daily caloric requirement for Haiti is 2270 given the country's age and sex composition. The next step in the estimation process is to determine the level of consumable calories (i.e. net of storage and processing losses) provided by the food producing and distribution sectors of the country.

Estimates of calories produced in the country were needed in order to establish a basis for trend projections of actual annual caloric availability. Calculating the total calories produced from all food crops is a very time consuming process, and the data is relatively weak. A shortcut approach is to use grain availability and some reasonable assumption about how much of the total diet consists of grains. Undoubtedly, grains as a proportion of the total diet varies from year to year depending on the relative availability and price of grains.

Food production has varied significantly from year to year over the past decade as revealed in Figure 1.3. Cereal production per capita (Figure 1.4) has shown even greater volatility. In consideration of such volatility, more or less "normal" years were chosen for which the proportion of grains in the diet could be estimated. Making an independent estimation was deemed to be very important as other available estimates ranged from a low of 32 percent (Tuck) to as high as 53 percent as the review in Chapter II describes.

The available data on harvested hectares of maize and yield per hectare were reviewed in order to establish more or less normal years. From the data presented in Table 1.2, it appeared that 1977 and 1981 were average years; that is, both the hectares harvested and yield/hectare were relatively close to their respective means for those years. In addition, a year was chosen for which grain production was relatively high so that an upper level of grain consumption as a proportion of the diet could be established. The year 1980 was chosen to represent the good grain crop year. Other available literature tended to corroborate the reasonableness of these choices.

Accordingly, estimates of total calories available for consumption were calculated for all domestically produced foods for 1977, 1980, and 1981 (Table 2.12). The conversion factor for each food item is presented in the table, and each crop production level is adjusted for storage, post-harvest, and processing losses. Estimated caloric availability from imports is presented in Table 2.13.

A summary of these figures is presented in Tables 2.14 and the proportion of the diet (in caloric terms) which consists of grains is calculated for each year. The proportion of the total calories available to the population which is derived from imported foodstuffs ranges from 18 percent in 1977 to 21 percent in 1980 and 1981. Grains as a source of total caloric availability for the two "normal" years was 42 percent in

TABLE 2.12
ESTIMATED ANNUAL CALORIC AVAILABILITY FROM DOMESTIC PRODUCTION (1977, 80, 81)

| COMMODITY (Cal./Kg.) | 1977 | | 1980 | | 1981 | |
|---|---|---|---|---|---|---|
| | MT | CAL. (Million) | MT | CAL. (Million) | MT | CAL. (Million) |
| Rice (3623) | 51,888 | 187,990 | 54,707 | 198,203 | 65,588 | 237,625 |
| Maize (3602) | 112,182 | 404,080 | 150,480 | 542,029 | 119,822 | 431,599 |
| Sorghum (3423) | 79,010 | 270,451 | 78,165 | 267,559 | 77,558 | 265,481 |
| Potatoes (695) | 7,400 | 5,143 | 8,400 | 5,838 | 8,400 | 5,838 |
| Sweet Potatoes (968) | 227,470 | 220,191 | 170,820 | 165,354 | 174,105 | 168,534 |
| Cassava (1085) | 129,064 | 140,034 | 129,648 | 140,668 | 130,816 | 141,935 |
| Yam (1085) | 78,840 | 71,114 | 72,270 | 65,188 | 75,555 | 68,151 |
| Other Roots and Tubers (983) | 26,600 | 26,148 | 27,300 | 26,836 | 29,400 | 28,900 |
| Beans (3366) | 39,419 | 132,684 | 38,430 | 129,355 | 42,930 | 144,502 |
| Plantain/Bananas (714) | 196,703 | 140,446 | 201,317 | 143,740 | 220,675 | 157,562 |
| Pulses (Peas) (3366) | 17,779 | 59,844 | 16,296 | 54,852 | 25,466 | 85,719 |
| Beef (1610) | 24,592 | 39,593 | 27,775 | 44,718 | 30,750 | 49,508 |
| Mutton (1941) | 622 | 1,207 | 690 | 1,339 | 714 | 1,386 |
| Goat (1129) | 5,568 | 6,286 | 4,860 | 5,487 | 4,896 | 5,528 |
| Pigs (pork med. fat) (2339) | 30,100 | 70,404 | 23,435 | 54,814 | 16,448 | 38,472 |
| Chickens (1473) | 4,700 | 6,923 | 6,000 | 8,838 | 6,500 | 9,575 |
| Other Eggs(1448 | 470 | 681 | 490 | 710 | 500 | 724 |
| Eggs (whole) (1448) | 1,865 | 2,701 | 2,930 | 4,243 | 3,000 | 4,344 |
| Ducks (2081) | 69 | 29 | 72 | 30 | 73 | 31 |
| Geese (2083) | 23 | 9 | 23 | 9 | 24 | 10 |
| Turkey (2680) | 225 | 84 | 230 | 86 | 231 | 86 |
| Horses (1610) | 4,000 | 6,440 | 4,400 | 7,084 | 4,400 | 7,084 |
| Horse Offals (315) | 500 | 158 | 550 | 173 | 550 | 173 |
| Milk (cow)(660) | 23,652 | 15,610 | 19,000 | 12,540 | 20,000 | 13,200 |
| Milk(goat)(920) | 25,200 | 16,632 | 26,400 | 17,424 | 27,000 | 18,469 |
| Vegetables(265) | 206,045 | 54,602 | 217,325 | 57,591 | 221,057 | 58,580 |
| Fruits (330) | 325,667 | 107,470 | 343,497 | 113,354 | 435,094 | 115,300 |
| Fish (1825) | 8,548 | 15,600 | 9,016 | 16,454 | 9,171 | 16,737 |
| Sugars (1521) | 311,059 | 473,121 | 328,154 | 499,122 | 333,788 | 507,691 |
| Total Calories | | 2,475,675 | | 2,583,638 | | 2,582,744 |

TABLE 2.13
ESTIMATED CALORIC AVAILABILITY FROM IMPORTS

| COMMODITY (Cal./Kg.) | 1977 | | 1980 | | 1981 | |
|---|---|---|---|---|---|---|
| | MT | CAL. (Million) | MT | CAL. (Million) | MT | CAL. (Million) |
| Wheat & Meslin (2824) | 100,067 | 282,589 | 150,130 | 423,967 | 139,979 | 395,301 |
| Wheat Flour (3640) | 15,669 | 57,035 | 16,700 | 60,788 | 13,770 | 50,123 |
| Maize (3602) | 19,650 | 70,779 | 5,000 | 18,010 | 10,000 | 36,020 |
| Soy Bean Oil (8822) | 15,401 | 135,868 | 20,388 | 179,863 | 22,719 | 200,427 |
| CottonSeed Oil (8822) | 57 | 503 | 0 | | 0 | 0 |
| Bacon & Ham (1040) | 28 | 29 | 2 | 2 | 7 | 7 |
| Meat/Cow (1610) | 15 | 24 | 434 | 699 | 282 | 454 |
| Sheep (557) | 1 | 1 | 5 | 3 | 44 | 25 |
| Caned Meat (2156) | 275 | 593 | 249 | 537 | 160 | 345 |
| Milk/Fresh(660) | 1 | 1 | 195 | 129 | 168 | 111 |
| Dry Milk (NFDM) (3593) | 1,394 | 1,104 | 3,800 | 3,010 | 4,000 | 3,168 |
| Evap.Milk (1377 | 6,213 | 1,889 | 6,500 | 1,976 | 6,500 | 1,976 |
| Totals | | 550,413 | | 688,984 | | 687,957 |

TABLE 2.1.4

ANNUAL CALORIC AVAILABILITY AND PROPORTION OF GRAINS IN DIET
1977, 80, 81
SUMMARY TABLE

| CATEGORY | 1977 (MILLION) | 1980 (MILLION) | 1981 (MILLION) |
|---|---|---|---|
| Estimated Caloric Availability from Production & Imports | 3,026,090 | 3,272,622 | 3,270,701 |
| Population | 4.749 | 5.009 | 5.095 |
| Per Capita Daily Caloric Availability | 1,746 | 1,790 | 1,759 |
| Calories from Grains | 1,272,924 | 1,510,556 | 1,416,149 |
| Grains as Proportion of Total Calories | 0.420 | 0.460 | 0.430 |

1977 and 43 percent for 1981. The figure for the good grain crop year of 1980 was 46 percent.

Whitney's assessment of the Tuck model was based on an alternative estimation that used cereals, vegetable oil, tubers, pulses, bananas, and plantains. He concluded that these food items comprised 68 percent of the Haitian diet. Accordingly, two alternative projections of food availability were made using the 42 percent and 68 percent assumptions and are presented in Table 2.15. For each assumption, a daily caloric deficit per capita was calculated by subtracting available calories per capita from the needed level of 2270. An average deficit based on the mean of the two projected levels was also calculated. For each of the three estimates, projections of the deficit were made through 1995 by extending a five-year moving average for each deficit estimate.

Each deficit trend was then transformed into annual wheat equivalent terms for the nation by multiplying the per capita daily caloric deficit by 365 days and the population level and dividing by the number of calories in a metric ton of wheat (i.e. based on 2824 cal/kg. of wheat).

These projections reveal that for the low estimate (A) the need for wheat-equivalent calories range from 250 to 263 thousand metric tons of wheat-equivalent per year from 1988 to 1995 above current trend levels of imports and food aid. The high estimate varies from 265 to 336 thousand metric tons over the same period, with an average estimate ranging from 258 to 300 thousand metric tons. Food aid levels were running in the range of 84,000 to 100,000 MT over the base period used for the projection. Therefore, wheat equivalent needs to be met by food aid could range as high as 355 to 436 thousand MT. As will be seen, it would be impractical to attempt to meet all these needs with grain food aid.

## F. Implications for Food Aid Commodity Mix

The distribution and level of hunger and malnutrition revealed in Haiti accentuates the critical importance of the food aid commodity mix for Haiti. Substantial malnutrition among large numbers of low-income families spread throughout the country argues strongly, on the one hand, for an extensive Title I/III program whose commodities can be distributed throughout the country utilizing existing market channels. By increasing the program sufficiently to meet the needs of a greater proportion of the population, the grains can be made available at relatively lower prices, insuring that more low-income people will be able to purchase the food. There is no evidence that lower grain prices will create disincentives to local producers under the current economic conditions in Haiti. Grain levels that served to drive prices toward the world market level would likely have salutary effects on the overall economy because of improved nutritional levels and enhanced purchasing power of consumers.

On the other hand, identifiable "pockets of poverty" in remote rural communities call for targeted Title II funding programs, MCH, SF, and FFW. Such programs also expand the range of commodities that can be included in the food aid package. Clearly, large numbers of impoverished people can be identified in almost every area of Haiti, so low-income

Table 2.15

Calories Deficit Computation (1976-1985) and
Projection (1986-1995), Haiti

| Year | Total Calories in the Diet (Caloric Content) | | | | Deficit Computation | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | From Cereals Only | Total Estimate Based on Assump. (A) | Total Estimate Based on Assump. (B) | RDA* | Per Capita Deficit Based on (A) | (B) | Average | Projected Needs Annual Wheat Equivalent (MT) (A) | (B) | Average |
| 1976 | 755 | 1,798 | 1,761 | 2270 | 472 | 335 | 404 | | | |
| 1977 | 829 | 1,974 | 1,834 | 2270 | 296 | 257 | 277 | | | |
| 1978 | 703 | 1,675 | 1,616 | 2270 | 595 | 471 | 533 | | | |
| 1979 | 848 | 2,018 | 1,900 | 2270 | 252 | 200 | 226 | | | |
| 1980 | 868 | 2,066 | 1,971 | 2270 | 204 | 129 | 166 | | | |
| 1981 | 825 | 1,965 | 1,971 | 2270 | 305 | 231 | 268 | | | |
| 1982 | 841 | 2,002 | 1,860 | 2270 | 268 | 238 | 253 | | | |
| 1983 | 788 | 1,876 | 1,706 | 2270 | 394 | 386 | 390 | | | |
| 1984 | 813 | 1,937 | 1,775 | 2270 | 333 | 320 | 327 | | | |
| 1985 | 749 | 1,784 | 1,648 | 2270 | 486 | 450 | 468 | | | |
| 1986 | | | | 2270 | 345 | 344 | 344 | 247,587 | 246,941 | 247,264 |
| 1987 | | | | 2270 | 342 | 352 | 347 | 246,035 | 253,229 | 249,632 |
| 1988 | | | | 2270 | 339 | 359 | 349 | 250,392 | 265,086 | 257,739 |
| 1989 | | | | 2270 | 336 | 367 | 352 | 252,236 | 275,262 | 263,749 |
| 1990 | | | | 2270 | 333 | 375 | 354 | 253,983 | 285,673 | 269,828 |
| 1991 | | | | 2270 | 331 | 382 | 356 | 255,823 | 295,598 | 275,710 |
| 1992 | | | | 2270 | 328 | 390 | 359 | 257,561 | 306,526 | 282,044 |
| 1993 | | | | 2270 | 325 | 398 | 362 | 259,529 | 316,056 | 287,793 |
| 1994 | | | | 2270 | 323 | 405 | 364 | 261,425 | 326,202 | 293,814 |
| 1995 | | | | 2270 | 320 | 413 | 366 | 263,322 | 336,348 | 299,835 |

* Adjusted for Population Composition

(A) Based on assumption that cereals constitute 42% of the diet

(B) Assumes that cereals, vegetable oil, tubers, pulses, bananas, and plantains constitute 68% of the diet -- based on Tom Whitney's estimates.

groups appear to benefit from almost any kind of food aid program, and certainly all of the Title II programs. Yet, the mandate to reach the "poorest-of-the-poor" compels program administrators to shape Title II programs in sensitive, creative ways to maximize their impact on targeted, low-income communities.

Sufficient research has not been undertaken to determine the maximum level of food aid that could be effectively administered in Haiti. The significant budget constraints being experienced by most of the PVOs suggest that they can not currently expand their efforts in the absence of significantly greater levels of operational support. Moreover, they are looking to USAID and the GOH for some of these funds, drawing on counterpart fund accumulation under Title III sales. The WFP may be the most likely candidate for expanded operations because of their dependence on GOH bureaucracy at a time when the GOH is seeking to establish a greater sense of legitimacy at the local level.

Wheat, vegetable oil, and soybeans, are the most likely commodities for expanded use under Title III in Haiti, although consideration could be given to corn, rice, and dairy products, although rice and corn could create negative political repercussions because of the fear of production disincentives. Since most food grains have a high degree of substitutability, the choice of grain used for food aid does not really matter as much as the lay person may feel it does. Soybeans and dairy products could be programmed through value-added industries that would help create more new investment, jobs, and a wider range of palatable food in the country.

A broader range of Title II and 416 programs commodities in the targeted programs (e.g. bulgur, fortified corn meal, dairy products) could also help generate new, value-added business and industry through coordinated FFW projects and new investment opportunities capitalized out of accumulated counterpart funds. Increasing the current level of food aid under Title II can be accomplished only with extreme caution. PVOs appear to be operating near capacity and face stringent financial constraints. Expansion of their programs require advance planning and organizational work at the community level. They are now faced with the alternatives of raising additional outside financial support, appealing to the GOH and USAID for financial support, or simply curbing their food aid activities at their current levels. These ideas will be developed further in the final section of this report.

A suggested strategy for addressing the issue of commodity mix is to apportion the predicted deficit among the types of foods generally consumed in the diet. In other words, research shows that cereals constitute 36-46 percent of the caloric intake in the Haitian diet, and certainly no more than 50 percent. Hence, no more than 50 percent of the caloric deficit could be made up by increased shipments of wheat through Title III or bulgur and corn-soy mix under Title II. Following this approach, additional shipments of up to 125,000 metric tons, or 225,000 MT of total food aid, in wheat-equivalent terms would be justified in 1988, more than doubling the current level of the Title III program. Additional milling capacity would also be needed to sustain this level of grain imports. The Minoterie is currently operating at somewhat less

than its full capacity of roughly 130,636 MT per year, and storage is severely limited. Doubling the current level of food aid imports would require both substantially greater expanded storage and processing capacity.

The caloric gap balance could be diminished further by vegetable oil shipments that addressed up to nine percent of the needed calories. Note that oils constituted nine percent of the volume of foods consumed in 1980 (Table 2.7). This would result in additional shipments of up to approximately 7,000 metric tons of vegetable oil, or an increase of roughly 76 percent above the current level of 9,175 metric tons. Hence, the total oil shipments would be approximately 16,000 MT.

Drawing on the food balance sheet developed in Tables 2.12 and 2.13, other items can be identified which provide guidelines for additional food aid commodity selection. For example, dairy products (fresh milk and dry milk) constitute 35829 million calories out of 3,026,090 million produced and imported in 1977, an equivalent of only one percent of the diet. Low consumption may be due to limited purchasing power, lactose intolerance of the majority of the adult population (milk sugar not easily metabolized with symptoms of bloating, diarrhea and nauseau), availability and cultural food habits. However, dairy products consumption generally increases very rapidly in developing countries, so that perhaps two or three times this amount could be introduced into the diet if it were culturally acceptable. Assuming a multiple of three, then up to 5,900 metric tons of dry milk could be effectively utilized in the diet.

Up to this point, 50 percent of the deficit has been met by increased wheat shipments, nine percent by vegetable oil, and three percent by dairy products making up 62 percent of the deficit. Turning to a major staple such as beans may provide guidelines for soybean imports to help meet the protein needs of the diet which are currently being met by edible beans. Currently, soybeans are not an automatic substitute for domestically produced pinto beans in the Haitian diet. Even with new varieties of edible soybeans, it is unlikely that they can be substituted effectively into the diet without educational programs and low prices. Beans and pulses comprised six percent of the calories available in Haiti in 1977. Accordingly, 68 percent of the gap would be filled if soybean imports were increased by 11,600 metric tons of beans and could substitute for domestic beans. Even with these generous assumptions, 32 percent of the food gap remains to be filled.

Based on the data in this report, McIntyre (Memo of 1-26-88) offered an alternative which deserves careful scrutiny and provides an alternative basis for further discussion of this critical topic. Drawing on the volume of the eight most available items in the Haitian diet, she proposed the following:

McIntyre Strategy for Commodity Mix
Recommendations and Agricultural Production Strategy

| Commodity | % of diet | Accumulated % | Replace by Food Aid? | |
|---|---|---|---|---|
| Grains | 36-46% | 36-46% | yes | |
| Dairy | 1-3 | 37-49 | yes | |
| Veg. Oil | 6 | 43-54 | yes | |
| Beans/pulses | 6 (1) | 49-60 | no | Focus of Agricultural Production Strategy |
| Roots/tubers | 16-17 (2) | 54-77 | no | |
| Sugar | 13-17 | 67-94 | no | |
| Fruit | 5-8 | 72-102 | no | |
| Plaintains | 6-8 (3) | 78-110 | no | |

(1) Shown as 6% of calories in discussion, Table 2.7, shows 9-17% of volume of food in diet. Authors admit soybeans are unlikely substitute for beans and pulses consumed in Haitian diet--therefore, I gave this a "no" on whether it could be replaced by food aid.
(2) From Table 2.7
(3) From Table 2.12

Note: Rice might be the exceptional grain which one would include in a Haitian agriculture strategy for its quick-cooking quality which decreases pressure on forest resources.

A variety of other food commodities, food supplements and development strategies will be required to meet these needs. Stimulating agricultural development and food crop production specifically is the only strategy that can reasonably meet the needs of the country in either the short or the long run. Unfortunately, even massive international food aid transfers will be unlikely to meet the food needs of the Haitian population even in the short run. The administrative, distributional and related cost requirements are simply too great to overcome immediately. A substantially increased food aid program appears to be needed and will, even then, only be a supplemental tool within a much broader based agricultural development strategy. The tragic error would be to not recognize the current extent of food needs in the country and the potential of food aid as a developmental resource for helping generate sustained economic development.

## G. Fuel Needs and Reforestation

Observers of the food situation in Haiti are extremely concerned about overcutting of the scarce forestry resources in the country. The problem appears to be more accentuated in the post-Duvalier era as restrictions on cutting are somewhat more relaxed. Overcutting contributes to soil erosion and water management problems which are being addressed by other USAID efforts. Nevertheless, the issue is intimately bound up with food needs and the commodity mix made available under food aid programs, as some foods require more fuel for preparation.

Ongoing reforestation programs in Haiti require that the meager forest resources of the country be protected. Doing so necessitates reduced incentives for "robbing" the forests to provide fuel for bakeries, oil distilleries, and other industrial users. Alternative sources of fuel must be found.

There is mounting sentiment in Haiti to include wood products in the "food aid" mix recommended by the country. The authors recognize the severity of the problem and realize that it is intertwined with food aid considerations. Also, other fiber products (e.g. cotton and tobacco) have been included under PL 480 in other "food aid" programs. However, because of the severity of hunger and malnutrition in Haiti, we believe that the longer term credibility of U.S. food aid efforts would be strengthened by using other legal provisions to ship wood products to Haiti on a grant or highly concessional basis.

Accordingly, we recommend that the fuel needs of the country be explicitly addressed by USAID and PVOs in Haiti and that a legal basis for helping meet fuel needs be explored. We further recommend that USAID urge the U.S. Government to clearly distinguish the fuel program from the food aid program, even if PL 480 is the legal basis for the shipments. An additional caution is to carefully examine the implications for household income of those families involved in growing and distributing wood products in Haiti. Efforts should be made to fully compensate for any domestic displacement of income that may result from such aid efforts. the fuel/food aid program in Haiti does not need to generate further political antagonisms among the Haitian public.

Our assessment is that a fuel-aid program, if properly conceived and implemented, could be enormously beneficial to the long-term needs of the country. One suggestion is for a five-year import program for wood products which would allow new, fast-growing species in Haiti to reach a more mature stage of development. Rather than being prematurely cut, wood could be obtained after five years by selective cuttings, and the wood import program could be gradually phased out (Bailey memo of 2/3/88).

The next sections of the report describe the food distribution structure, market organization, and the structure and approaches of PVOs. Current food aid efforts and levels are identified, and the developmental potential of food aid is analyzed along with potential disincentives. Finally, more detailed attention is given to an appropriate food aid program consistent with a strategic country development strategy.

# III. MARKET ORGANIZATION AND STRUCTURE FOR GRAINS AND OILS

## A. Wheat Flour

The market for wheat flour has many of the characteristics of a competitive market structure. There are many buyers and many sellers and there is no barrier to entry. Licensing requirements provided some entry barrier until the regulation was dropped in early 1988 when wheat flour was dropped from the import quota list. In urban areas where the bulk of wheat flour that enters the market system is sold, price information is readily available. Flour prices are responsive to market conditions and are not set by government. The GOH sets the price at which flour is sold by the government-owned mill, the Minoterie, to wholesalers. Subsequent sales through distributional channels among wholesalers, retailers, and to the final consumer are determined by the market. Thus, the market for wheat flour approximates a competitive structure.

The wheat flour market is influenced by the prices of related products such as maize, rice, and sorghum. There is no refined time series data with sufficient numbers of observations available to complete a demand analysis of the relationships among these commodities. Yet, understanding the interrelationships in consumption is a critical prerequisite to analyzing potential and actual disincentives created by food aid shipments. For example, importing wheat for consumption will displace other domestically produced grains, everything else being equal. Thus, the prices of the other grains will fall, leading to reduced production of domestic grains if, in fact, disincentives are created. An examination of these interrelationships can be made by estimating the effects of price changes of wheat flour, the imported grain, on the consumption of other principal grain products produced in Haiti; maize, rice, and sorghum.

A cursory estimation of these interrelationships were made by calculating cross-price elasticities between flour and each of these commodities. The following results were obtained:

$$E_{1,2} = .19$$
$$E_{3,2} = .73$$
$$E_{4,2} = .87$$

where the subscripts 1 = maize, 2 = flour, 3 = rice, and 4 = sorghum. These are arc elasticities calculated by substituting price and quantity data for 1976 and 1981 into the equation

$$E_{i,j} = (Qi2 - Qi1)\ (Pj1 + Pj2)/(Qi1 + Qiz)\ (Pjw - Pj1),$$

where Ei,j is the cross-price elasticity of commodity i with respect to commodity j. The cross-price elasticity of .19 between maize and flour indicates that a ten percent increase in the price of flour would cause a 1.9 percent increase in the quantity of corn consumed. The positive sign implies a substitution relationship between the two commodities. That is, in this particular case, increased prices of flour cause people to cut back on the quantity of flour consumed and

purchase relatively more maize instead. Similar interpretations apply to the other cross-price elasticities. These elasticities show that the prices of the three commodities would move in the same direction in a free market.

The relatively low level of substitution between wheat flour and maize is rather surprising, as sorghum and rice are substitutable on almost a 1:1 basis. Clearly, maize is viewed as a staple in the diet, for which wheat flour is not a good substitute.

The main purpose of estimating these cross-price elasticities is to quantify the interrelationships in consumption between two commodities which can be used in commodity pricing decisions. They also reveal important characteristics of consumer tastes and preferences and how consumer preferences affect the market for food commodities.

The relationship between, say, maize and flour also implies that a low flour price in Haiti would cause maize producers to sell their maize to purchase flour or flour-derived products in the short run, given the relatively high price of maize. In the long run, however, the price of maize will fall as more consumers choose the cheaper flour or flour-related products. The direct effect of such price interaction on maize production would depend in part, on the number of maize growers who produce the crop for sale and the interrelationship between maize yield and increased acreage planted to maize. The relationship described above applies to all the related crops. The results indicate that consumers will shift away from sorghum and rice much more readily than from maize.

## B. Competitive Pricing as a Means to Discourage Contraband

Imported wheat in Haiti is handled exclusively by the Monoterie, a government-owned milling and distribution operation. The main objectives of this food marketing system should be to bring about:

(a) efficient economic growth,
(b) a more equitable distribution of incomes,
(c) the nutritional well-being of target populations and secured supply of food (Timmer et al. p. 151). The degree to which these objectives can be attained by a given marketing system depends, in part, on the structure of the market. The performance of marketing functions by the Minoterie, Haiti's only wheat milling/marketing enterprise is said to be plagued by structural inefficiencies which to a large extent preclude market responsiveness to needs in the broader socio-economic environment. The Minoterie's ability to effectively translate its comparative advantage over U.S. mills in marketing wheat flour in Haiti is demonstrated by (1) ocean freight differentials which favor bulk wheat over sacked flour, (2) the low wage structure in Haiti, (3) the conversion of by-products into saleable millfeeds, (4) its capacity to re-oxygenate wheat flour that has been kept in

stock for a prolonged period, and (5) the rapidly growing demand in Haiti for wheat flour.

Until recently, the wheat flour market was dominated, and is probably still led, by the Minoterie. The fall of the Duvalier regime and the reopening of provincial ports of Haiti ushered Haitian consumers into an era of relative food plenty with significant quantities of contraband wheat flour which sold at prices lower than those charged by the Minoterie. Estimates of contraband imports into Haiti over the 1986/87 period are presented in Table 3.1 where the contraband volume is compared to food aid levels for the same time period. Since most of the contraband entered the country over a 12 month period (July 86 - June 87), the quantity of food imported as contraband may well have been double the amount entering as food aid over the same time period. Hence, official estimates of import trends such as those provided in Figure 3.1, which omit contraband, and per capita availability (for example, a continuing downward trend in Figure 3.2) would have to be revised upward to reflect the higher food availability due to contraband. The downward movement in per capita availability in 1984-85 (Figures 3.2 and 3.3) is almost certainly reversed by higher levels of available food in 1986-87. This would suggest that the commercial import portion of Figure 3.3 would expand in subsequent years and that net consummable cereals (Figure 3.4) would show an expansion of wheat as a portion of the total since relatively more wheat flour than rice is being imported as contraband.

The challenge to the Minoterie's control over the wheat flour market represented by contraband has had several far-reaching effects. On the positive side contraband has:

(1) provided new jobs,
(2) contributed to a significant reduction in the cost of living, and
(3) caused a drastic shift in the distribution of incomes.

The negative effects of contraband have been equally far-reaching. There are claims, not fully substantiated, that it has:

(1) facilitated tax evasion, which translates into substantial losses of tax revenues;
(2) caused disrespect for GOH;
(3) disrupted domestic production; and
(4) reduced revenue from the sale of locally milled wheat flour by the Minoterie (Contraband: Economy and Politics p. 11).

The important questions that surface from this situation are: (1) Why are contraband operators achieving most of the objectives of a food marketing system when the Minoterie is having difficulties trying to do that?; (2) How can the Minoterie effectively marshall all the advantages it has over importers and bring down its unit cost of wheat flour to compete with contraband?; (3) A third and more policy-oriented question is, what is contraband, and is there really a true contraband situation in Haiti? We will attempt to address the first

TABLE 3.1

ESTIMATES OF CONTRABAND IN HAITI COMPARED TO AVERAGE FOOD AID IMPORTS, 1986/87

| COMMODITY (Conversion Factor)[1] | CONTRABAND (MT) Imports[2] | CONTRABAND (MT) Wheat Equivalent | FOOD AID (MT) Imports[3] | FOOD AID (MT) Wheat Equivalent |
|---|---|---|---|---|
| Rice (1.28) | 40,824 | 52,255 | | |
| Flour (1.29) | 27,216 | 35,109 | | |
| Bulgur (1.28) | | | 13,882 | 17,769 |
| Wheat | | | 125,086 | 93,815 [4] |
| Edible Oil (3.12) | 5,500 | 17,160 | 2,077 | 6,482 |
| Totals | | 104,524 | | 118,066 |

1 Converted to wheat equivalents on basis of caloric ratio of commodity to wheat.

2 Based on the annual average of estimates for 1986 and 1987 provided by two separate, confidential sources.

3 Average annual imports for 1986 and 1987.

4 Assumes a milling loss rate of 0.25

Figure 3.1

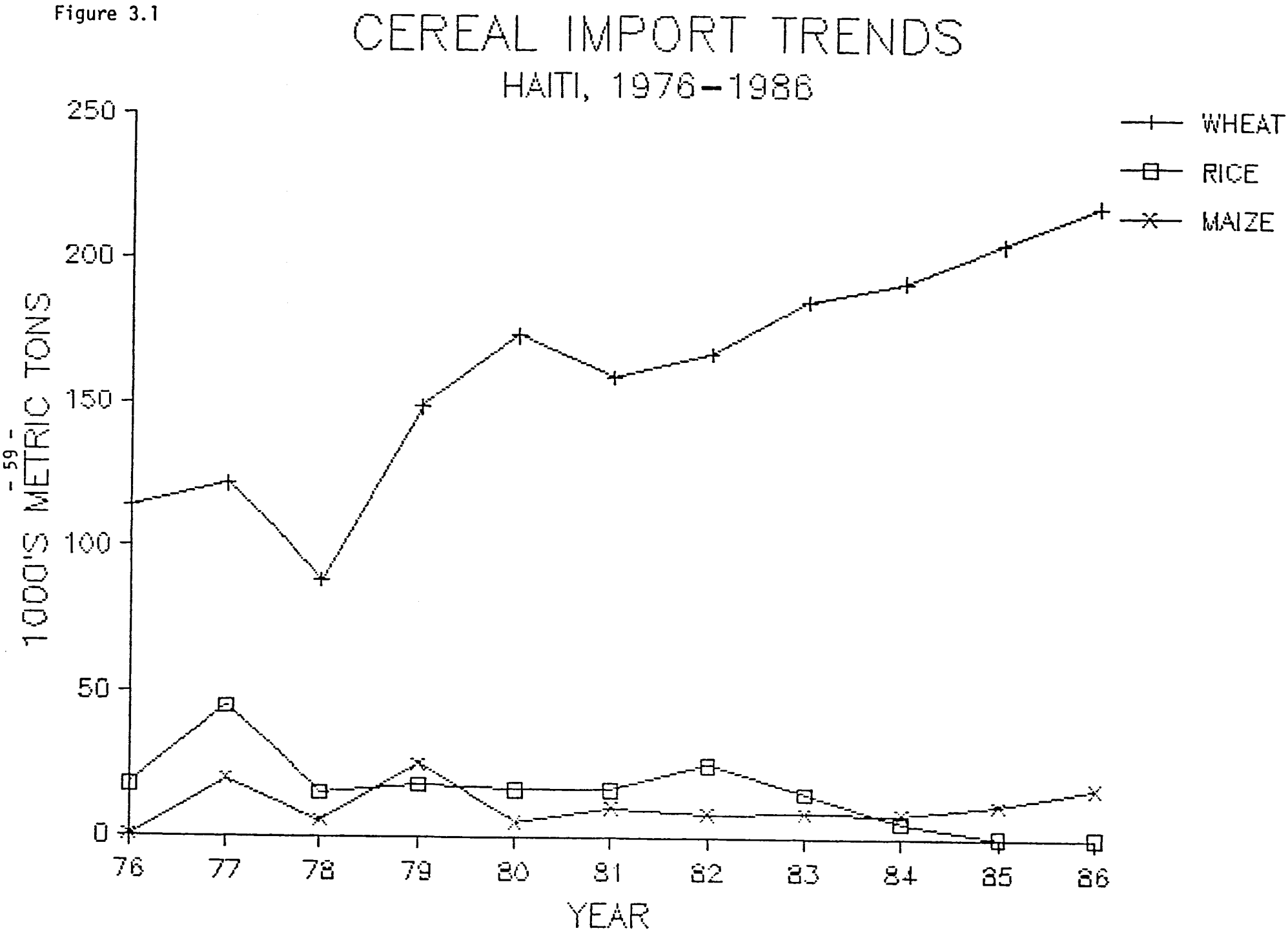

CEREAL IMPORT TRENDS
HAITI, 1976-1986
WHEAT
RICE
MAIZE
1000'S METRIC TONS
250
200
150
100
50
0
76
77
78
79
80
81
82
83
84
85
86
YEAR

Figure 3.2

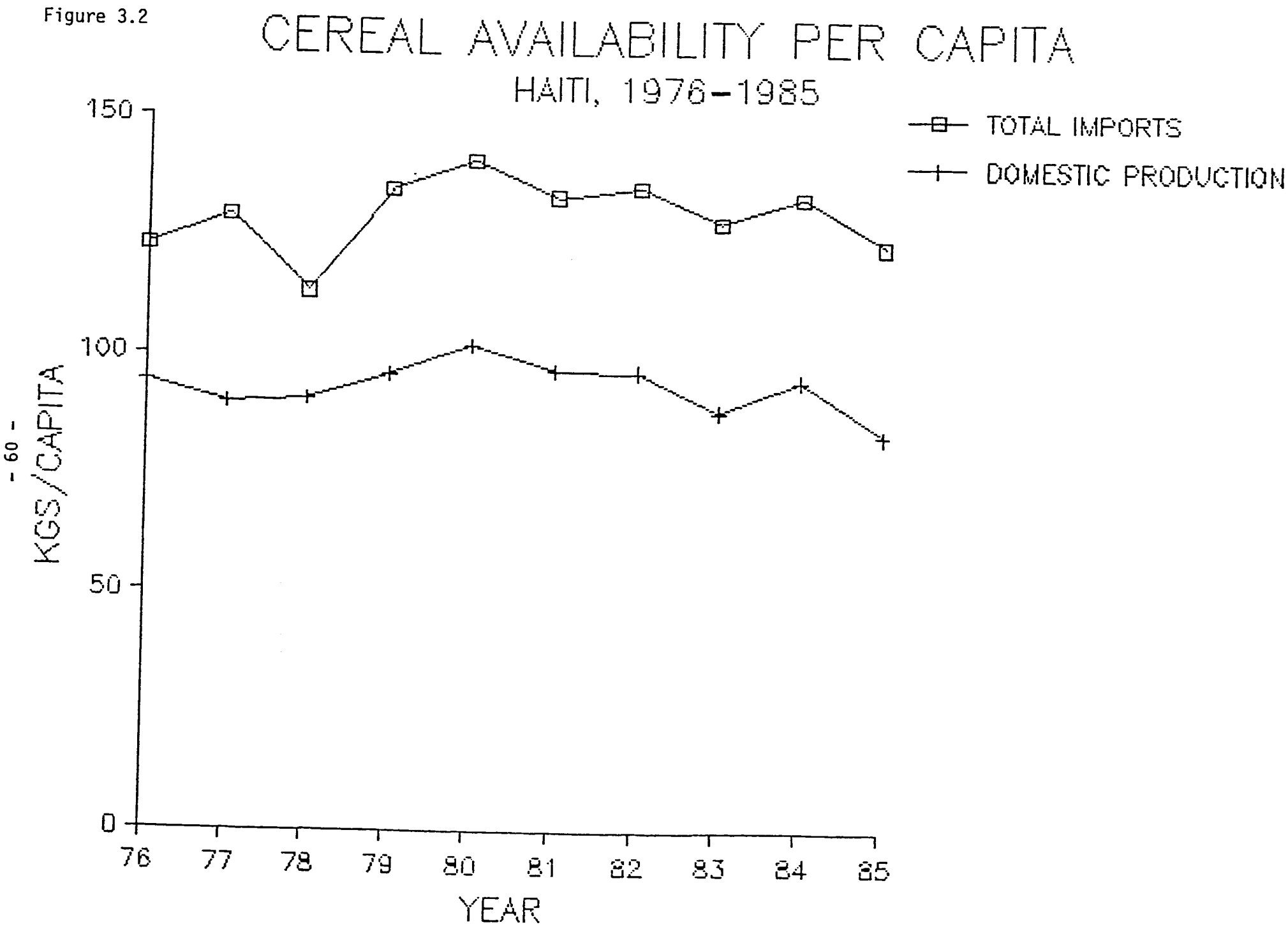

CEREAL AVAILABILITY PER CAPITA
HAITI, 1976-1985
TOTAL IMPORTS
DOMESTIC PRODUCTION
150
100
50
0
KGS/CAPITA
76
77
78
79
80
81
82
83
84
85
YEAR

Figure 3.3

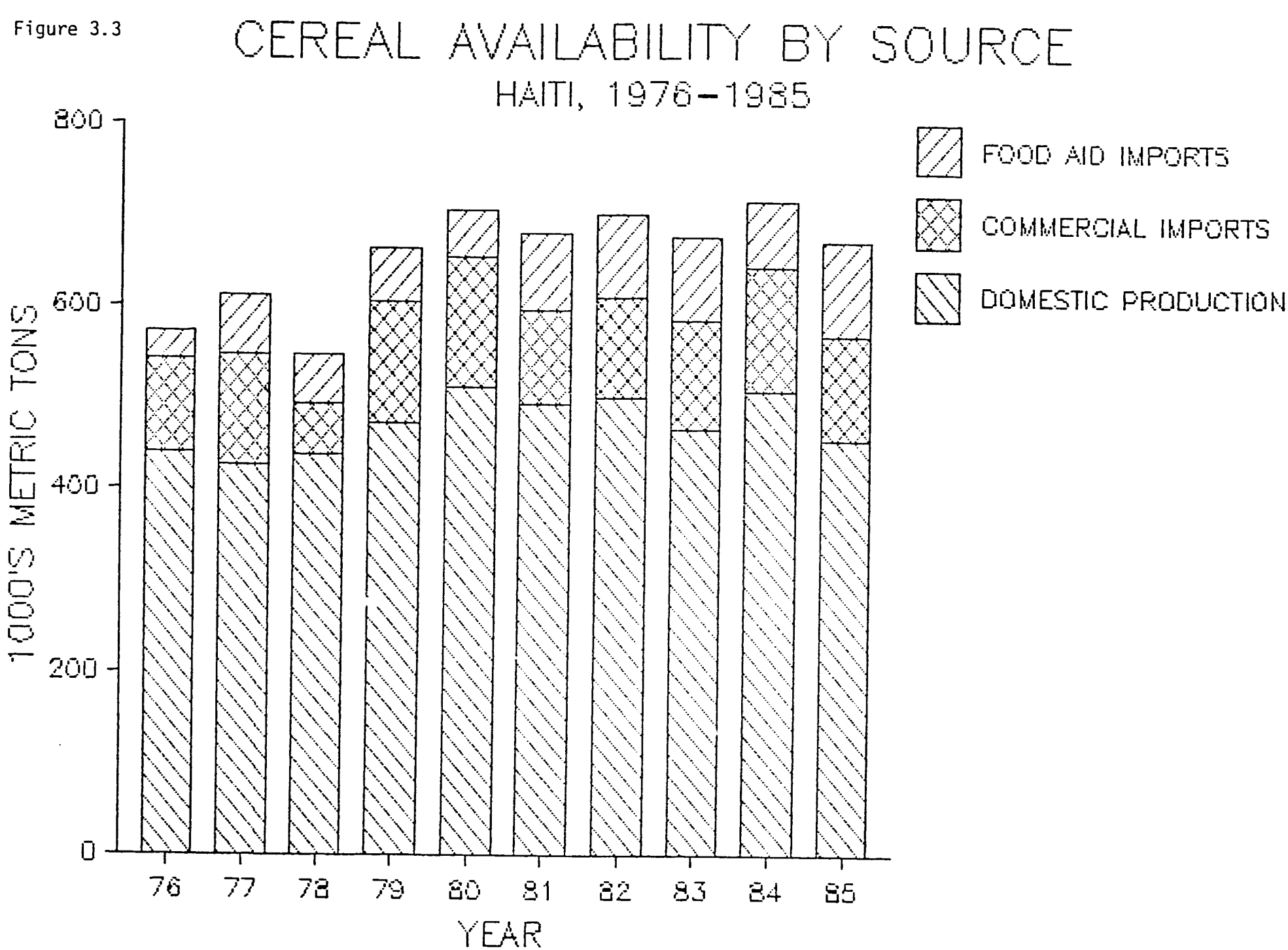
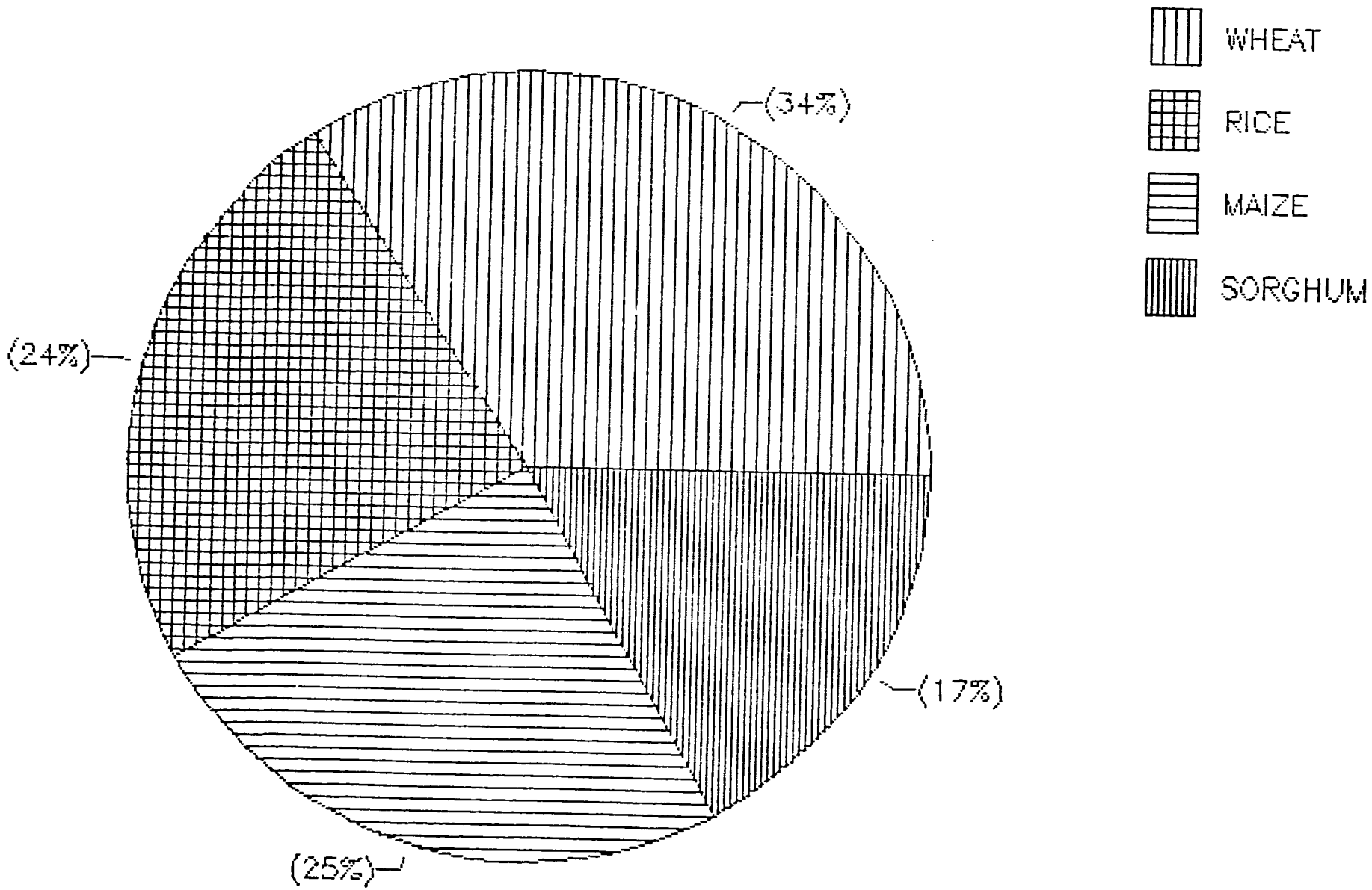

CEREAL AVAILABILITY BY SOURCE
HAITI, 1976-1985
800
600
400
200
0
1000'S METRIC TONS
76
77
78
79
80
81
82
83
84
85
YEAR
FOOD AID IMPORTS
COMMERCIAL IMPORTS
DOMESTIC PRODUCTION

Figure 3.4

# NET CONSUMMABLE CEREALS BY TYPE

## HAITI, 1985



two questions and leave the third to be answered by trade policy makers.

The first question relates to the cost structures for contraband flour and Minoterie milled flour. Contraband importers can obtain their flour at $17 a bag including $2.50 a bag for transportation. One bag of wheat flour sells for $22-$23 in Haiti. Thus the cheaper contraband wheat forces a lower price structure on the Minoterie. The contraband importers have local operatives who can sell their product at the retail level all over the country. They do not have substantial overland transport cost because they can ship the commodity to major population centers sometimes from ports which are located closer to the population than Port-au-Prince. All of these cost advantages, coupled with the conducive atmosphere in Haiti for such operations give contraband importers a favorable position in the flour market.

In order to combat contraband and use the Minoterie to provide a reliable source of revenue for economic development in Haiti, the GOH will have to make serious choices. The Minoterie must reduce its cost of operation, increase labor productivity through a coordinated program of training, avoid overstaffing, and, as a price leader, it must set its price low enough to compete with importers and yet high enough to remain a viable operation. This will require a regular adjustment of local prices of wheat flour within a range of Miami prices and in consideration of world market conditions.

A high flour price in Haiti without trade barriers of some sort, while prices are low or lower in Miami and other sources of contraband flour, would encourage an inflow of flour.

The Minoterie is reported to be currently conducting a price-tagging operation pegged to Miami prices, and the parastatal is effectively competing. However, it may not be able to operate at current cost levels and continue to sell its flour at contraband-induced prices. Thus technical assistance to the Minoterie should consider options which directly lead to cost effectiveness. The possibility of decentralizing the Minoterie's operations should not be ignored given the segmented nature of the Haitian flour market structure, a poor information system, high internal transport costs caused by a poor road network, and the reality that contraband commodities can be unloaded in various ports, thereby reducing the cost of transporting overland.

Though contraband is doing some good for some people in the short-run, its potential effects could be very detrimental in the long-run on the Minoterie, which did serve as a source of development funds for GOH, and on the agricultural sector. USAID could play an important role in the assessment of such potential effects, and, thereby, provide a basis for working with the GOH in designing a trade policy that would lessen, or even eliminate, high levels of contraband. Any ill-effects of contraband on domestic production and on farm income must be addressed immediately.

Trade and tariff policies must be realigned in recognition that the current levels of contraband reflect consumer driven demand for wheat

flour. The new GOH will have to tread carefully to avoid sharp consumer reaction to any practices that suddenly curtail the current levels of available food. A gradual realignment toward world market prices is probably the most defensible policy. Yet, consideration must be given to the revenue generating potential of import grains. If a move toward decentralized milling is contemplated, then internal allocation of grains among mills could be competitively determined by a bidding procedure or simply on the open, international market. Government revenues could be collected on a per-milled-bag basis.

## C. Market Pricing and Demand Consideration

While corn prices on the world market grew by 30 percent over the decade of 1976-86, corn prices in Haiti increased by 150 percent. Only the large importation of wheat and other foodstuffs under PL 480 Titles I, II, and III have prevented corn and other domestic grain products from increasing at a more rapid rate. Rapid price increases of corn in 1975, 1983, and post-1985 appear to have led to urban unrest and helped generate popular skepticism about GOH legitimacy (Faas, p. 257). Faas reports that wheat imports could be a disincentive only for a few large farmers who derive significant shares of income from corn sales (p. 260). According to Faas, most small farmers consume all the corn they grow and spend up to half of any additional income on more food, principally corn (p.260).

The GOH maintained the price of flour at the mill well above the border price until the price was forced down by contraband, but the rate of increase of wholesale prices has been maintained at below the rate of farmgate price increases for corn, sorghum and rice. Hence, the retail price increases for bread and other flour goods is below those for rice and corn (Faas, p. 254). Bread prices grew by a factor of 2.5 between 1970-84, rice prices increased 3.3 times and corn 6.4 times.

This careful management of wheat prices provides inducement for consumers to shift to wheat consumption. Yet, the more rapid increase in rice, corn, and sorghum prices certainly suggests that price incentives have continued to prevail for Haitian farmers vis a vis cheaper food imports. If these more rapidly growing prices for domestically produced grains stemmed from reduced plantings of these crops, some room for concern would exist. Trend data do not reflect such a concern (Tables 1.1, 1.2, 1.3, Figure 1.1).

Wheat imports have been used to keep consumer prices low, principally for the urban sectors of the country, while additional demand for domestic production has been sufficient to maintain increasing prices for domestic grains.

Faas (p. 255) cities evidence that after 1976 bread was becoming a substitute for corn. He notes that every year that corn and rice parallel prices increased (e.g. 1977, 1979-81, and 1983). His regression analysis between flour sales and the relative prices of corn

and flour after controlling for income was very strong for the time series (1966-83).

The suggestion here is that it is the increasing prices of corn, sorghum and rice that is driving the importation of wheat and flour. A high cross-price elasticity of demand appears to prevail. In this setting, it is clear that any sudden shortages of wheat/flour due to U.S. PL 480 policies would also drive up the price of domestic grains very rapidly. Figure 3.5 provides an overview of food aid quantities by type of grain over the 1976-85 period. Sudden shifts in food aid quantities in the absence of offsetting production levels in Haiti could have significant impacts on its urban population. Some security against such shifts in the quantity of food aid, would be desirable from Haiti's standpoint. Agricultural development strategies supported by food aid could be seriously disrupted by significant shifts in the international market that led to relative shortages in concessional sales and grant programs, such as occurred in the early 1970s with the so-called "Russian Wheat Deal" and the convergence of other economic events of that time (bad weather, two U.S. dollar devaluations, production deficits in other countries).

Unfortunately, there is little evidence to suggest that price-led quantity increases in domestic grains will occur. The low-technology, land-constrained, subsistence-oriented, domestic production of corn and sorghum will likely remain unchanged for the forseeable future. Rice production may be somewhat more responsive to price changes due to irrigation and fertilizer utilization, but the evidence of higher production potential in general for most grains is quite weak.

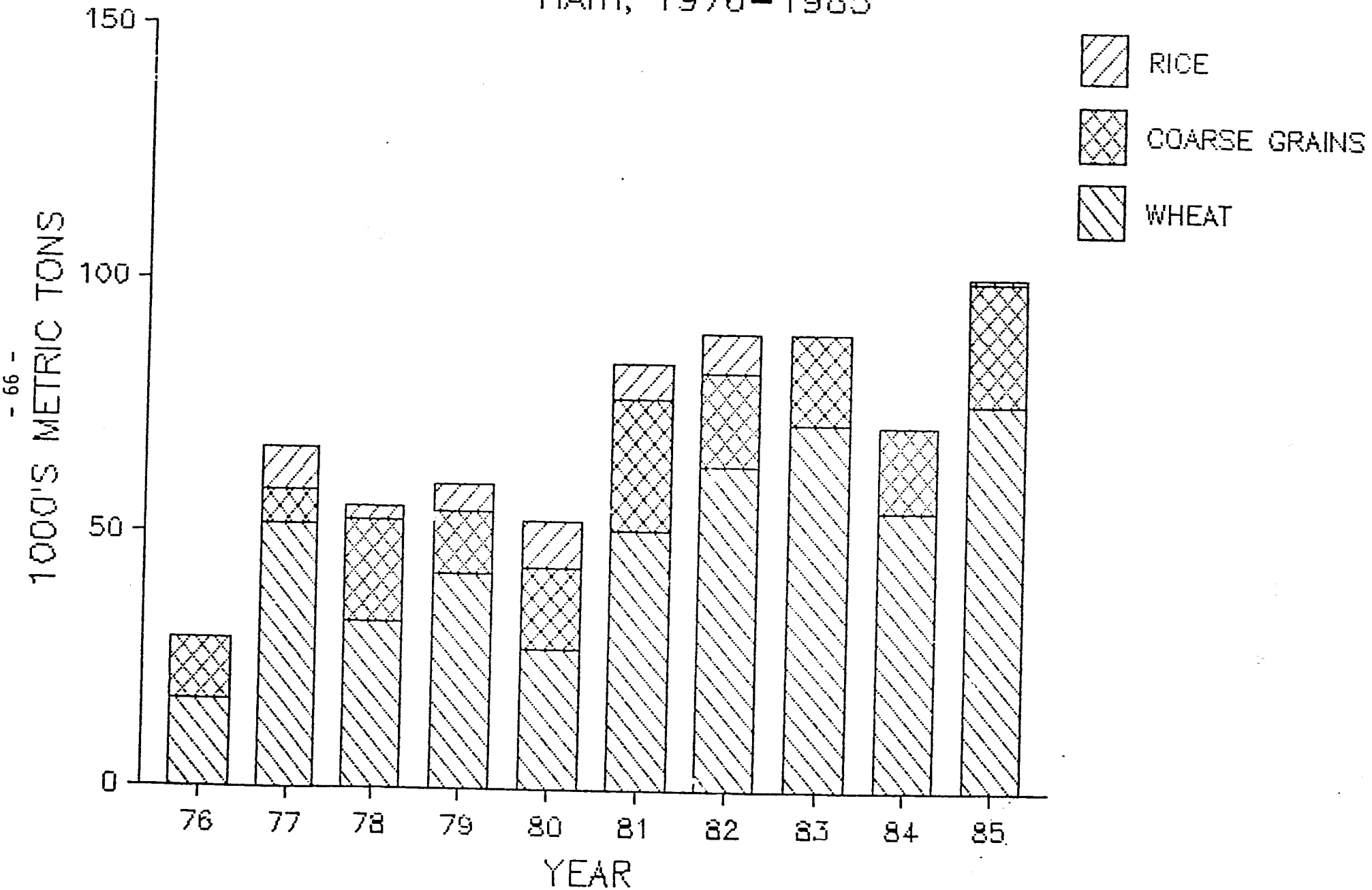
The last two years of significant food imports as contraband, reflecting more of an open market environment, have driven down the prices of all grains. If prices serve as a disincentive to local production in even a minute way, then planted acreage should have been sharply reduced for 1987. Our hypothesis is that only a slightly perceptible change, if any, will have occurred. Price reductions in the range of 50 percent which have been experienced for some commodities would have reduced acreage planted by 10 percent if the elasticity of supply was in the range of .20, a very low figure.

Farmers' responses to prices have a lot to do with the anticipated permanency of any changes. We have no information on this issue in the Haitian setting. If farmers' view the current "open market" environment as an approximation of the policies which will prevail in the future, then planting decisions and input adjustments will be made immediately. If more restrictive import policies are anticipated, then more or less "normal" plantings of a pre-contraband era will be followed. We simply do not have adequate data to provide any analytical insight into these issues.

A high elasticity of supply is more characteristic of an industrialized agriculture where inputs can be rapidly adjusted and substitute crops can be planted. The lack of observed responses in Haiti in no way runs counter to T. W. Schultz's rational peasant farmer model. Rather, the rational responses are severely constrained by the natural

Figure 3.5

# TOTAL CEREAL FOOD AID
## HAITI, 1976-1985



environment, economic uncertainty partly due to government policies, the unavailability of appropriate yield-increasing inputs, and the subsistence needs of small-scale farm families whose income levels place high penalties on errors of judgement regarding own production. The unavailability of new agricultural inputs, an effective extension system, and a supportive infrastructure to ensure food security, further restricts production options in Haiti and renders pricing policies relatively ineffective on the production side.

## D. Edible Oil

Like wheat flour, the retail market for edible oil is relatively competitive. However, no wheat is produced domestically while oil seeds are produced locally in small quantities. No data is available to analyze the interaction of locally produced edible oils and imported oils. By and large, processed oil, from soybeans particularly, plays an important role at all levels of the edible oil market. Again, this sector is highly dependent on imports of soybeans for sustaining its current level of production and meeting the consumption needs of the people. The retail market for edible oil is said to be responsive to demand forces throughout Haiti and, therefore, is a vital market.

During the previous regime the edible oil industry was in the hands of an oligopoly composed of about six private companies with owners who were politically well-connected. The seventh member of this oligopoly was SODEXOL (Societe d'Exploitation des Oleagineaux). SODEXOL had the capacity to crush and process oil seeds and semi-processed oils while the other six could process only semi-refined products and were required to obtain their raw materials from SODEXOL, their obvious competitor. Though GOH owned only 33 1/3 percent of SODEXOL, it assumed 100 percent of that private company's liability. The drain on GOH's resources led the GOH to purchase the balance of the ownership from the private shareholders of SODEXOL and renamed the company ENAOL (Enterprise Nationale des Oleagineaux).

ENAOL came into being at the time of political crisis. The civil disorders which led to Duvalier's departure seriously affected ENAOL and led to its final closure in 1986. Civil unrest in which displaced ENAOL workers played a leading role, coupled with public concern that the vital edible oil industry might fall completely into the hands of the other six companies, led GOH to form COPAIOL (Cooperative de Production Agricole et Industrielle des Oleagineaux) which is a worker's cooperative. This cooperative pays 5 percent of its annual profits to GOH and has a 30-year, 2 percent loan (with a 10 year grace period) of $1.5 million which was granted on May 29, 1987.

The crushing capacity of COPAIOL is estimated at 11,000 metric tons per month, but it is not certain that the entity will continue to operate at this level. The future viability of COPAIOL will depend critically on (1) the availability of soybeans to sustain its operation at a profitable level, (2) its ability to increase its share of

the market by competing, and (3) its efficient utilization of its vast oils processing capacity.

The entity is, however, being subjected to competitive forces. For example, the other competitors which, together, had 92-93 percent of the edible oil market lowered their price from $150 per 430 pound drum to $120 when COPAIOL had high inventory, and raised it back to the market-clearing $150 when COPAIOL's stock was low. This undercut COPAIOL's share of the market by about 7 percent for a brief period; but the cooperative has since increased its share. The figures for September, 1987 indicate a 12 percent share for COPAIOL.

The $1.6 million worth of soybean imports for sugar compensation under Section 416 for fiscal year 1987 will largely benefit COPAIOL. The continuation of such assistance contributes to the privatization efforts of the GOH. COPAIOL would have to compete by using all the advantages it has over European businesses that are said to be under-invoicing and yet ready to sign new agreements with GOH in 1988. The vegetable oil market is estimated at 36,000 metric tons in 1987 (Barry Riley, pp. 4-6). It is clear that competitive forces are at work in the edible oil market, but the number of active suppliers is limited. Technical assistance in the privatization efforts of GOH should consider options to improve GOH's revenue from all sources in the edible oil market, especially from COPAIOL, to enable that entity to meet debt obligations.

## IV. Current Status of Food Aid Efforts

The analysis of food needs presented in Section II indicates that food aid programs should continue to be at high levels for the forseeable future. This section describes the current status of these programs, strategies of users, patterns of beneficiaries, organizational and administrative approaches, and capacity for management. This section will also provide a foundation for the remaining analysis in the report with the aim of delineating strategies for an effective developmental and humanitarian role for food aid in Haiti.

Food aid is provided to Haiti from seven different program sources: the U.S., the European Economic Community (EEC), France, the Federal Republic of Germany, Japan, Switzerland, and the World Food Program. As Figure 4.1 reveals, the U.S. and EEC provide 97 percent of total food aid to Haiti. These donors provided over a dozen commodities, though wheat is the dominant product. Other foods provided include wheat flour and bulgur wheat, red beans and soybeans, butter oil, enriched milk, vegetable milk, dry milk, oats, rice, canned meat and fish, corn and cornmeal. A summary of the principal commodities provided over the 1976-85 period is presented in Table 4.1. The importance of cereal food aid to total domestic availability is revealed in Figure 4.2. Figure 4.3 reveals the dominance of cereals in the total food aid picture for 1985.

### A. P.L. 480 Program Titles and Levels of Food Aid

#### 1. Titles I/III

U.S. food aid is currently distributed to Haiti under two principal titles, Title II and Title III. The latter has evolved from the concessional sales program initiated under Title I and is often referred to as Title I/III since conversions from one program to the other is possible at any time. Haiti's current Title III program was signed on May 30, 1985 after substantial negotiating with the GOH regarding management of financial accounts, use of local currencies, and agricultural policy provisions (See Morton, Leroy and Harmon, 1985).

The Title III objectives encompass significant policy reforms on the part of the GOH aimed principally at reducing natural resource degradation and taking related steps to improve agricultural productivity. Programs to address these problems must be carried out by GOH and financed by accumulated local currencies generated by the sale of the Title III commodities. Hence, Title III provides needed food commodities to Haiti in the form of grants as long as the counterpart funds generated by commodity sales are used for approved economic development purposes. This program serves to bind USAID and the GOH into a joint program for agricultural policy reform and economic development.

PL 480 Title III resources are conditional upon the annual attainment of self-help objectives agreed upon jointly by USAID

Figure 4.1

# TOTAL FOOD AID BY DONOR
## HAITI, 1985

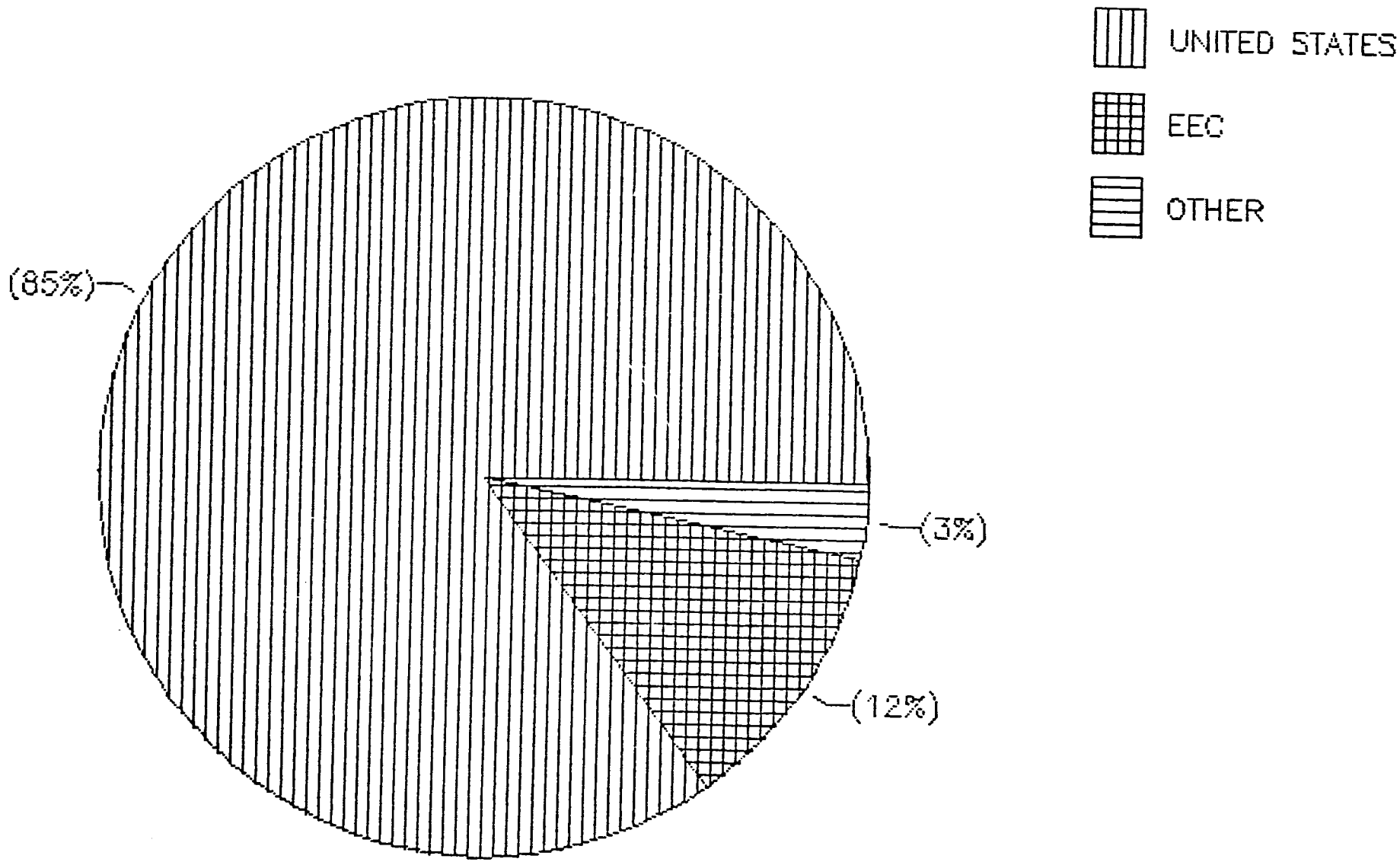


TABLE 4.1

TOTAL FOOD AID BY TYPE, HAITI
(METRIC TONS)

| | TOTAL CEREALS | WHEAT | RICE | COARSE GRAIN | MILK* POWDER | OTHER* DAIRY | VEG. OIL |
|---|---|---|---|---|---|---|---|
| 1976 | 29,300 | 17,100 | -- | 12,200 | | | |
| 1977 | 66,700 | 51,600 | 8,300 | 6,800 | | | |
| 1978 | 55,400 | 32,800 | 2,700 | 19,900 | | | |
| 1979 | 59,500 | 42,300 | 4,900 | 12,300 | 2,672 | 541 | 4,915 |
| 1980 | 52,700 | 27,300 | 9,200 | 16,200 | 3,296 | 1,117 | 5,125 |
| 1981 | 83,600 | 51,000 | 6,800 | 25,900 | 2,734 | 1,257 | 2,804 |
| 1982 | 89,900 | 63,400 | 7,900 | 18,600 | 2,793 | 1,003 | 9,020 |
| 1983 | 89,700 | 71,900 | -- | 17,800 | 2,798 | 73 | 8,024 |
| 1984 | 71,600 | 54,700 | 100 | 16,700 | 3,656 | 53 | 6,061 |
| 1985 | 101,200 | 75,700 | 900 | 24,600 | 3,954 | 67 | 5,911 |

Source: Levitt & Laurent, World Bank
*Source: FAO

Figure 4.2

# CEREAL AVAILABILITY BY SOURCE

## HAITI, 1985

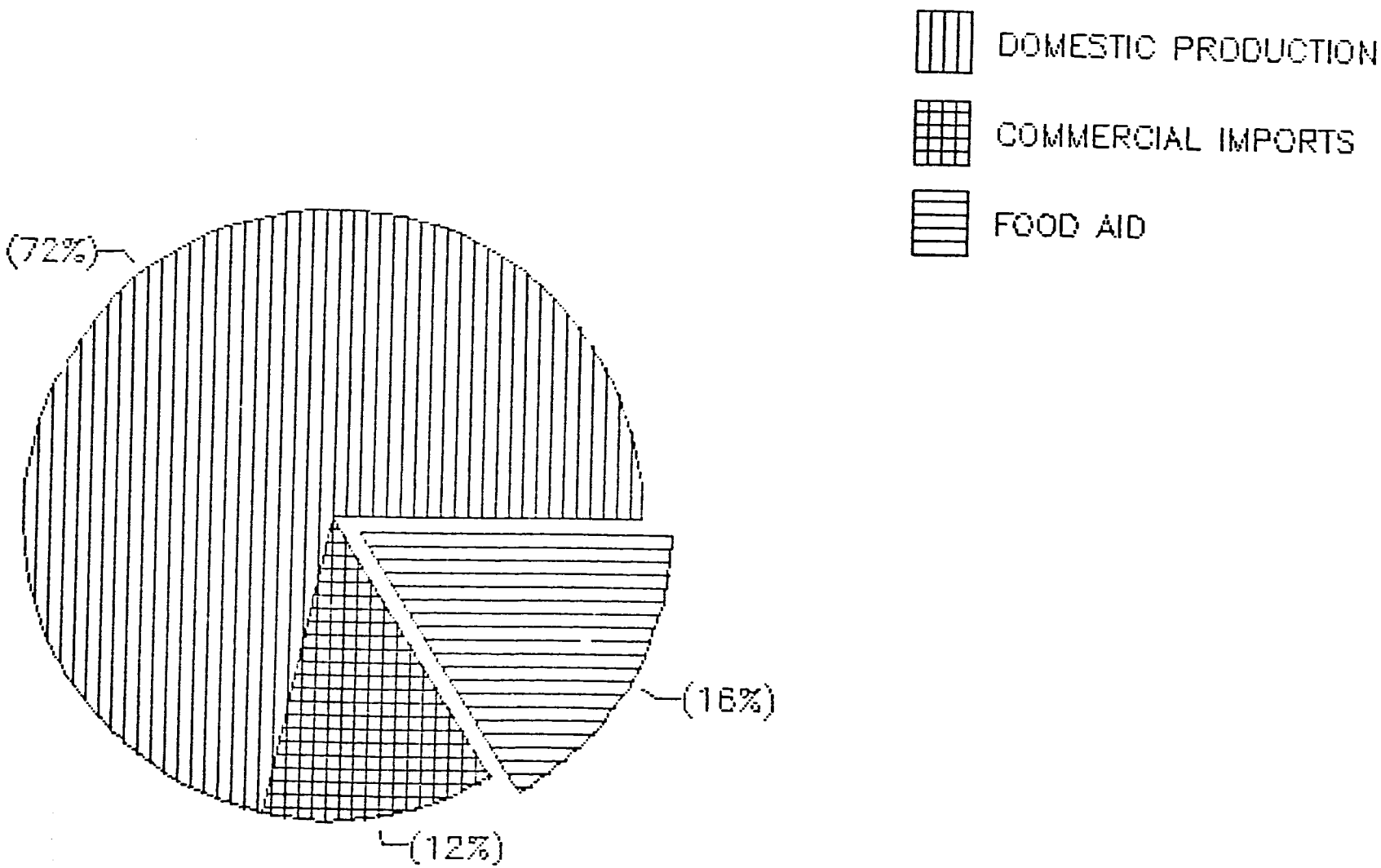
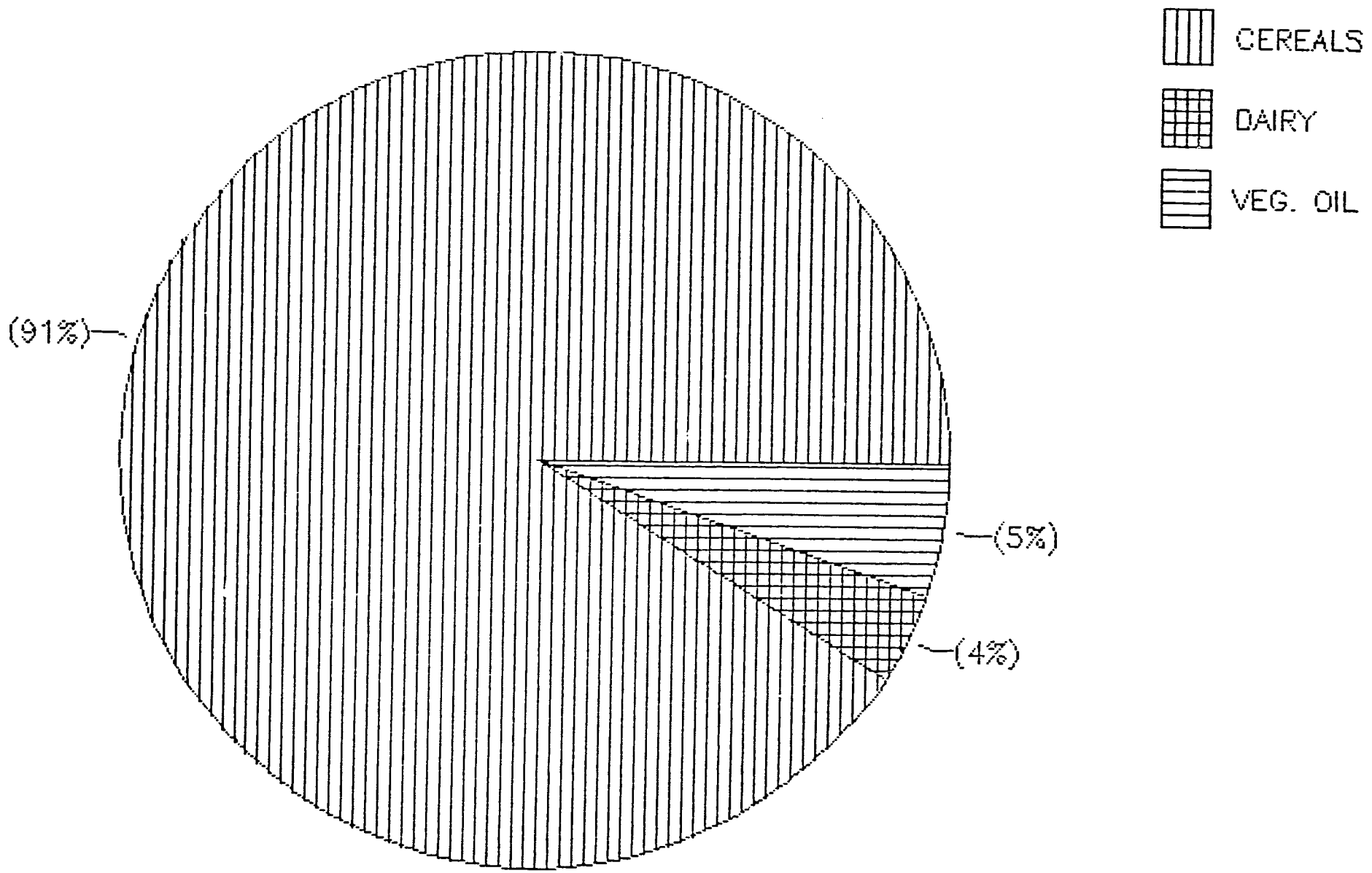


Figure 4.3

# TOTAL FOOD AID BY TYPE
## HAITI, 1985



and the GOH. USAID effectiveness in shaping the direction and implementation of the development objectives depends on its influence at various levels and the leverage it chooses to use and can afford to exercise.

As originally conceived, the Title III program was to be USAID's largest single program, expected to generate over $50 million in counterpart funds to support a three-year (1985-88) Food for Development Program. The proposed budget for this program is taken from Morton, et al. (1985) and included here (Table 4.2) to illustrate the breadth of the proposed program. The point here is to emphasize that the major accomplishment of a Title III program rests with the ultimate impacts of the various activities carried out under each of the component activities identified in Table 4.2.

The volumes of wheat and vegetable oil under Titles I/III and Section 416 over the period 1980/81 to 1986/87 are provided in Table 4.3. Section 416 commodity shipments are intended to buffer the economic costs to the country from sugar revenues lost because of the U.S. sugar subsidy program.

Title I/III Beneficiaries

Two very different flows of benefits occur under Titles I/III: (1) benefits that accrue to the country through effective use of counterpart funds and (2) benefits that accrue directly to consumers who purchase food out of regular market channels. Greater quantities of food are made available on a steady basis and the price of the commodities are generally lower than they would be in the absence of food aid programs.

The first set of beneficiaries depends on the budget allocations delineated above for the jointly programmed activities carried out by USAID and GOH. In the first instance, these funds are expended for program operations and support the personnel and expenses thereby entailed. The ultimate benefits depend on the success of the reforms initiated under these programs. The objective is to use the funds to achieve structural reform in the social and economic framework of Haiti. The long term benefits on low-income segments of the population are derivatives of the reform process. Since the objectives of the PL 480 program are to achieve economic development so that humanitarian objectives are ultimately attainable, the reform processes set in motion must be adequately monitored in order to determine the ultimate impact and beneficiaries. This aspect of PL 480 programming is quite significant but is probably the least understood.

In Haiti, a portion of counterpart funds is designated for use by Title II implementing agencies, principally PVOs. These funds help support operational aspects of PVO food aid projects. Some concern was expressed by GOH representatives about the use of these funds. They felt that supporting MCH and SF programs may be reasonable, but not for FFW and other uses. Since most PVOs

TABLE 4.2

BUDGET FOR PL 480 TITLE III COUNTERPART FUNDS

| | FY 86* | FY 87 | FY 88 | TOTAL |
|---|---|---|---|---|
| | (in Millions of US Dollars) | | | |
| AGRICULTURE | | | | |
| ADS II (Farming system Research/Extension) | .50 | .50 | .50 | 1.50 |
| Strengthening Rural Credit Services | 1.50 | 1.50 | 1.50 | 4.50 |
| Irrigation and Soil Conservation Development | 1.50 | 2.50 | 3.00 | 7.00 |
| Coffee/Cocoa Production | .50 | .50 | .70 | 1.70 |
| Cereal Production Improvement | .50 | .50 | .50 | 1.50 |
| Crop Protection | .20 | .25 | .30 | .75 |
| Animal Health and Husbandry Improvement | .25 | .50 | .50 | 1.25 |
| Agricultural Studies | .15 | .25 | .10 | .50 |
| Local Resource Development | .30 | .40 | .30 | 1.00 |
| Agriculture Total | 5.40 | 6.90 | 7.40 | 19.70 |
| HEALTH | | | | |
| Targeted Community Health Outreach | 2.00 | 2.00 | 2.00 | 6.00 |
| Management of Malaria | 1.10 | 1.00 | 1.00 | 3.10 |
| Family Planning Outreach | .30 | .30 | .30 | .90 |
| Community Water Systems | .15 | .15 | .10 | .40 |
| Health Total | 3.55 | 3.45 | 3.40 | 10.40 |
| TRANSPORT | | | | |
| Secondary Roads | 3.40 | 3.40 | 3.40 | 10.20 |
| PL 480 TITLE III MANAGEMENT | .40 | .30 | .30 | 1.00 |
| SUPPORT TO PL 480 TITLE II | 1.00 | 1.00 | 1.00 | 3.00 |
| SUB TOTAL | 13.75 | 15.05 | 15.50 | 44.30 |
| Unprogrammed PL 480 Title III funds** available for Agriculture, Health and Transport Projects | 3.25 | 1.95 | 1.50 | 6.70 |
| GRAND TOTAL | 17.00 | 17.00 | 17.00 | 51.00 |

** As commodities' local sales prices are greater than costs, counterpart funds generated exceed FOB/FAS prices. Thus a $15 million sales agreement generates $17 million in counterpart funds.

Source: PL 480, FY 1985, Title III Agreement

in Haiti fear significant reductions in their own financial contributions, they are looking to counterpart funds for further support in the future (Westcott, Oct. 27, 1987).

The second benefit flow stems from the consumption patterns in the regular, commercial food distribution channels in Haiti, where the milled wheat and processed vegetable oil are distributed to the population. India and some other countries have utilized special low-priced, distribution outlets for food aid to increase the likelihood that low income families will be more likely to benefit from the subsidized food commodities. Since Haiti does not use such a system, the benefit pattern is shaped by purchasing power, access to retail markets, and the relative tastes and prices among food aid commodities and other foods produced in the country.

An important policy issue is the extent to which low-income people benefit from food aid that enters regular marketing channels. John Mellor has been a principal advocate of using this approach to reach low-income consumers, and it would appear to be an effective approach in Haiti because domestic prices are so much higher than world market prices for most grains. The assumption here is that food prices are relatively lower than they would have otherwise been as relatively higher quantities of food are placed on the market. Low-income purchasers of food derive disproportionate benefits from the food aid because they spend a higher proportion of their income on food. Thus, with a given expenditure, they can purchase more food. If the price decline is sufficient, then a lesser absolute amount may be spent on food (for the same or more quantity) and more money made available for non-food expenditures. This latter case has a demand-stimulating effect on the economy and may be a driving force for economic development. This so-called "income effect" has been shown to be an important factor stimulating economic growth in studies by Lewis (1964) and Bezuneh and Deaton (1985).

## 2. Title II Levels, Administrators and Beneficiaries

Under Title II, food commodities are provided as direct grants to private voluntary organizations (PVOs) and to the World Food Program (WFP) of the United Nations. USAID provides general oversight for program implementation, but responsibility for the organization of project efforts, the storage, transportation, and administration of the implementation of food distribution rests with the PVOs.

Four agencies administer almost all of the Title II programs in Haiti: CARE, Catholic Relief Service (CRS), Adventist Development and Relief Agency (ADRA), and WFP. A few other agencies are involved to a much less extent; e.g. CARITAS, CARTAS, PROTOS, and a number of non-governmental agencies in Haiti. These organizations distribute food under a wide range of project activities designed to address the immediate needs of the

poorest segments of the Haitian population. Few would argue that the programs always reach the "poorest-of-the-poor." Yet, they are targeted programs which address the needs of the lower-income segments of the population and help to insure that low-income people receive the food. The programs are in no direct way dependent on the purchasing power of the recipient.

A brief synopsis of the types of programs undertaken in Haiti under Title II and the number of beneficiaries under each program will be presented. Table 4.4 presents a summary of major Title II programs for the period 1983-87. Subsequently, some aspects of the administrative approaches of each agency will be discussed to help guide improved programming for the future.

Types of Programs

1. Food for Work (FFW)

A wide variety of community development projects are undertaken with food commodities used as wage payments to workers on these public works projects. Different countries and agencies have tended to emphasize different types of projects. For example, the WFP focuses on irrigation, soil conservation, and reforestation projects. CARE has worked with the Peace Corps to develop potable water systems, reforestation, soil conservation, and seed multiplication projects such as the Les Cayes Rice Project. France has developed an on-site training program for traditional farmers, and Germany has implemented irrigation and soil conservation projects.

FFW projects are now supposed to be carried out under generally accepted criteria that have been jointly prepared by PVOs and USAID/FFP. These criteria appear to be widely accepted and used by PVOs and WFP. The criteria are as follows:

FFW projects must:

- be restricted to food deficit areas
- respect the agricultural calendar
- be of temporary nature (maximum 6 months total implementation time)
- not be renewed
- recruit participants willing to work without pay; food is a nutritional supplement and not a wage equivalent
- recruit participants who directly benefit from the project output
- not re-recruit the same participants for new projects
- include other resources, such as technical assistance, tools and/or construction materials, as appropriate
- provide for long-term maintenance and sustainability
- minimize negative impact on the environment
- have a management committee to assure that the activity's objectives are achieved
- provide a timely, orderly and regular food delivery system to

TABLE 4.4

ANNUAL NUMBER OF BENEFICIARIES AND METRIC TONS OF FOOD DONATED UNDER PL 480 TITLE II BY PROGRAM
1983 - 1987

| PROGRAM | 1983 | | 1984 | | 1985 | | 1986 | | 1987 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | BENEFI-CIARIES | TONNAGE | BENEFI-CIARIES | TONNAGE | BENEFI-CIARIES | TONNAGE | BENEFI-CIARIES | TONNAGE | BENEFI-CIARIES | TONNAGE |
| MCH | 62,500 | 3,826.50 | 71,000 | 4,865.66 | 72,500 | 4,928.20 | 79,000 | 9,787.80 | 91,000 | 5,791.10 |
| SF | 429,000 | 10,904.80 | 442,000 | 16,985.20 | 444,000 | 13,493.50 | 552,500 | 21,745.90 | 547,000 | 21,488.70 |
| FFW | 84,500 | 3,678.50 | 77,000 | 6,922.32 | 70,500 | 6,161.70 | 32,750 | 3,002.80 | 30,000 | 2,810.70 |
| OCF | 6,300 | 471.00 | 6,500 | 637.20 | 6,500 | 637.20 | 8,500 | 738.40 | 8,000 | 709.30 |
| PSF | 24,000 | 170.90 | 21,300 | 876.20 | 20,000 | 1,087.20 | 9,500 | 366.80 | 19,000 | 883.30 |
| TOTAL | 606,300 | 19,051.70 | 617,800 | 30,286.58 | 613,500 | 26,287.80 | 628,250 | 35,641.70 | 707,200 | 31,683.10 |

ANNUAL FOOD CONSUMPTION OF DONATED FOOD PER BENEFICIARY BY PROGRAM
1983 - 1986 (Kg./Person)

| PROGRAM | 1983 | 1984 | 1985 | 1986 | 1987* |
|---|---|---|---|---|---|
| Maternal Child Health | 61.2 | 68.5 | 68.0 | 123.9 | 63.6 |
| School Feeding | 25.4 | 38.4 | 30.4 | 39.4 | 39.3 |
| Food for Work | 43.5 | 90.0 | 87.4 | 91.7 | 93.7 |
| Other Child Feeding | 74.8 | 98.0 | 98.0 | 86.9 | 88.7 |
| Pre-School Feeding | 7.1 | 41.1 | 53.4 | 38.6 | 46.5 |
| Simple Average | 31.4 | 49.0 | 42.8 | 56.7 | 44.8 |
| Weighted Average | 42.4 | 67.2 | 67.4 | 76.1 | 66.4 |

*Annual Estimated Requirement (AER), not actual

ensure that rations can be consumed in the time between distributions
- avoid distribution of commodities in original containers

Some observers doubt that these criteria are generally enforced. Moreover, the heritage of poorly chosen and weakly administered FFW projects has created a weak supportive environment for FFW. Many people in Haiti link FFW with political corruption and abuses of power. It is widely recognized that much of the outcry against FFW is politically motivated, expressing anti-U.S. sentiment as well as strongly held ideological differences among PVOs, and between PVOs, USAID and WFP. Irrespective of the motivation, the outcry against FFW has had the benefit of airing its legitimate shortcomings: poor selection of projects, lack of commitment of the participants/beneficiaries, etc. (Bailey memo of 2/3/88).

Even though vocal support is given to the above criteria, it is not clear how closely they are adhered to in practice. A perusal of the criteria reveals how easily substantial slippage in one or more items can occur. Delays of food shipments, poor weather, and a variety of local community dynamics can upset the implementation of the projects.

Food for Work projects have been the target of political activists in Haiti and have not been popular. As revealed in Table 4.4, the number of beneficiaries has fallen steadily over the 1983-87 period from 84,500 down to 30,000 in 1987. The tonnage of food aid has not dropped as drastically, perhaps indicating relatively fewer, but more longer-term, projects and higher quantity of food per participant.

Among the many reasons for the unpopularity of FFW is the view that it promotes a feeling of dependency because participants accept a "handout" rather than receiving wages or cash payments. In some cases the program has recruited migrant workers who do not feel committed to the community for whom the infrastructure is being created. Also, some infrastructure is built which then is not maintained by the community. Instead, the people wait for another FFW project to help pay themselves for their labor. There are widespread reports of corruption and mismanagement of the food distribution, lack of coordination among PVOs, poor targeting, and fear of production disincentives resulting from selling the commodities in the local markets.

The scope of this study did not permit a comprehensive assessment of the problems with FFW. It appears that rumors and charges of program abuse have fed on each other to the point that any future FFW programs face an uphill battle. This negative image persists in spite of many examples of well-established FFW projects and the growing demand for more FFW projects. Guidelines need to be reexamined and enforced in order to strengthen the basis for effective FFW programming since the country desparately needs food, has "surplus" labor available for project activities, and

would significantly benefit from the capital formation that could occur under FFW projects. The potential benefits of these programs will be identified and analyzed more thoroughly in Section V.

2. Maternal and Child Health (MCH) Projects

These programs distribute food rations directly to the poorest of the poor through health clinic programs. It is a very popular type of program that appears to address the most needy of the malnourished population. MCH participants are selected on the basis of their degree of malnutrition to insure that the more needy groups of people are included in the program. Health and nutrition education programs are linked to the food distribution. The number of beneficiaries under MCH has grown steadily and the program aims to provide feeding supplements for the families of the children and mothers served. The food ration is taken home where the entire family may benefit, not just the targeted group of participants. Clearly, mothers can not exclude other children, particularly, from consuming the food provided by this program. The social and psychological conflicts which may be created by such programs are spelled out in a recent article by Ferriani, et al. They cite an additional study by Vinha and Dutra de Oliveira, et al. which recommends that home distribution be avoided by requiring the most needy clientele to consume food supplements "at a cafe, grocery story, or other designated distribution center" (p. 80).

Such restrictions may help insure that the most nutritionally vulnerable children receive needed supplements. It does not address, on the other hand, the possibility that failures to show weight gains may be due to bacteria and worm infestations and other health problems. Moreover, it ignores the nutrition needs of other children in the same household who may be just above the malnutrition standard. The additional food made available to the family would have resulted in greater nutritional intake anyway. The central problem remains that of inadequate food for far too many rural poor children. However, the family may be taken out of the program if the targeted child does show appropriate weight gains. This provision could impose hardships on families with large numbers of children where the consumption is broadly distributed.

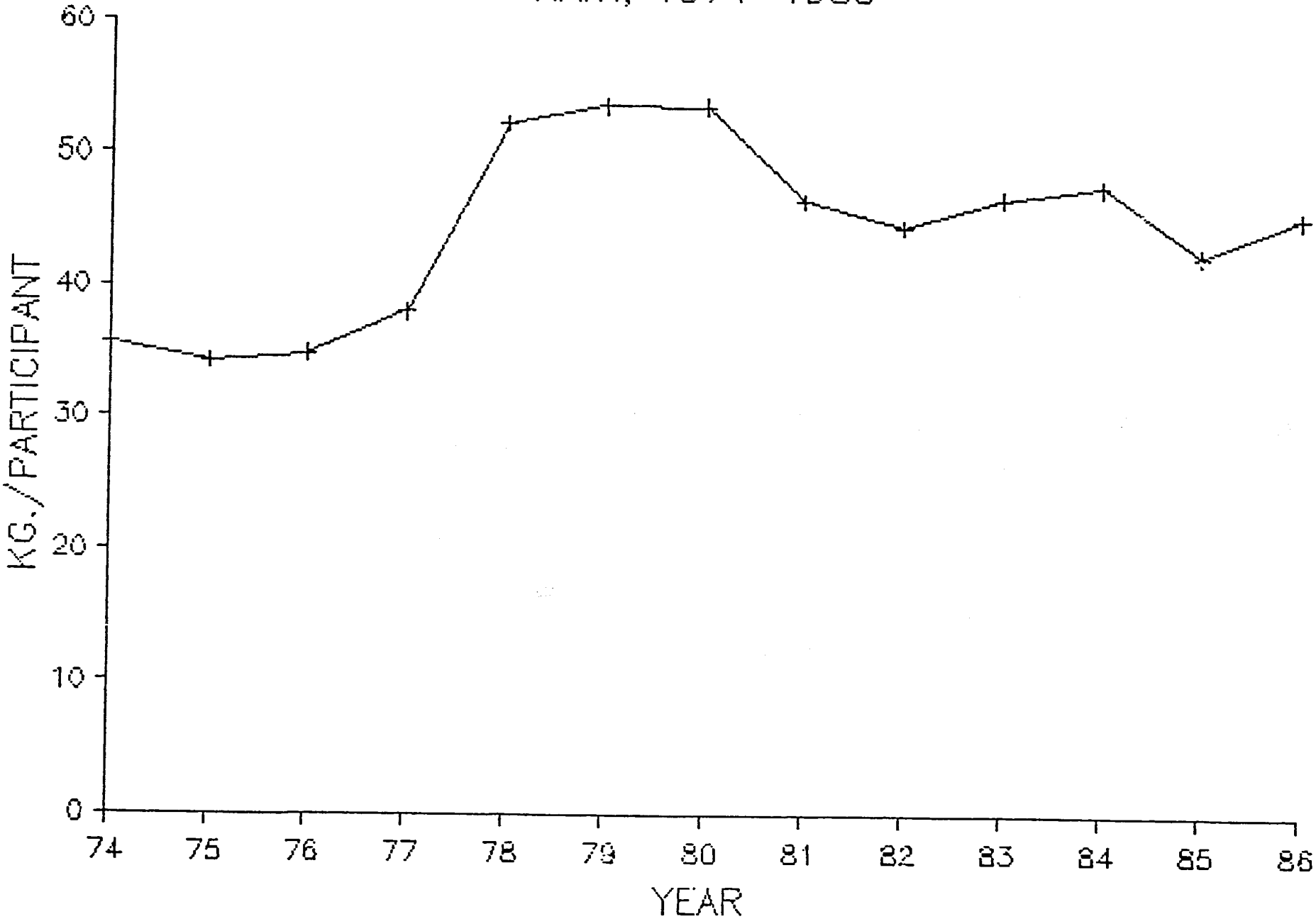
3. School Feeding (SF) Projects

School feeding programs are managed by the schools. They reach the largest number of people and provide the largest amounts of food commodities. The tonnage of food delivered nearly doubled over the 1983-87 period while the quantity of food per person increased significantly from 25.4 to 39.3 Kg/person (Figure 4.4). There has been some evidence that poorer schools receive less food aid while relatively better off children receive a hot lunch (Cotten, 1982).

Figure 4.4

# FOOD FOR PEACE, TITLE II

## HAITI, 1974-1986



Estimates of school attendance suggest that 80 percent of children in Haiti do not attend school. Undoubtedly, these are predominantly the poorest households in the country. Apparently, there is no effective program mechanism for reaching the bulk of rural, poor children.

These programs are implemented through the primary and secondary public and private schools in Haiti. Sixty to seventy percent of the schools in Haiti are private. The management of the programs at the school director level has been highly criticized. The women who cook the food are paid in food, and people suspect that school principals use some of the food to supplement their low salaries. As a result, local people appear to resent these programs even though their children are benefitting.

4. Pre-School Feeding (PSF) Projects

These projects are similar to the MCH projects except that the target population consists of malnourished preschool children. Some of the beneficiaries are fed on-site while others take home a food ration. Different effects may be realized on the target population because of intrafamily food distribution. When food is taken home it may be consumed by several family members rather than just the pre-school children as discovered in the study by Farriani, et al. (1985).

The number of beneficiaries under Title II has grown steadily over the past decade (Figure 4.5) with SF programs experiencing the greatest increase (Figure 4.6). School feeding programs represented 51 percent of the quantity of food distributed under Title II in 1986 (Figure 4.7) and 81 percent of the total beneficiaries (Figure 4.8). the SF program has the advantage of a ready-made distribution system in the form of the schools with teachers and administrators to help implement the program at the community level.

Organizational approaches

A major challenge to PVOs is establishing legitimacy at the community level. An effective counterpart organization or community leadership group is vital to the success of PVO efforts, and of food aid programs specifically. The organizational efforts necessary to establish legitimacy may suffer during periods of financial exigency such as most PVOs now face. Without new injections of financial support, it is unlikely that most PVOs will be able to respond to the growing demand for new food aid-supported projects. Rather, as their efforts will most likely be focused on consolidating their present project activity nurturing their existing support base at the local level. The pervasive political uncertainty in Haiti will almost certainly severely impede further local project development.

Figure 4.5

# BENEFICIARIES OF TITLE II
## HAITI, 1974-1986

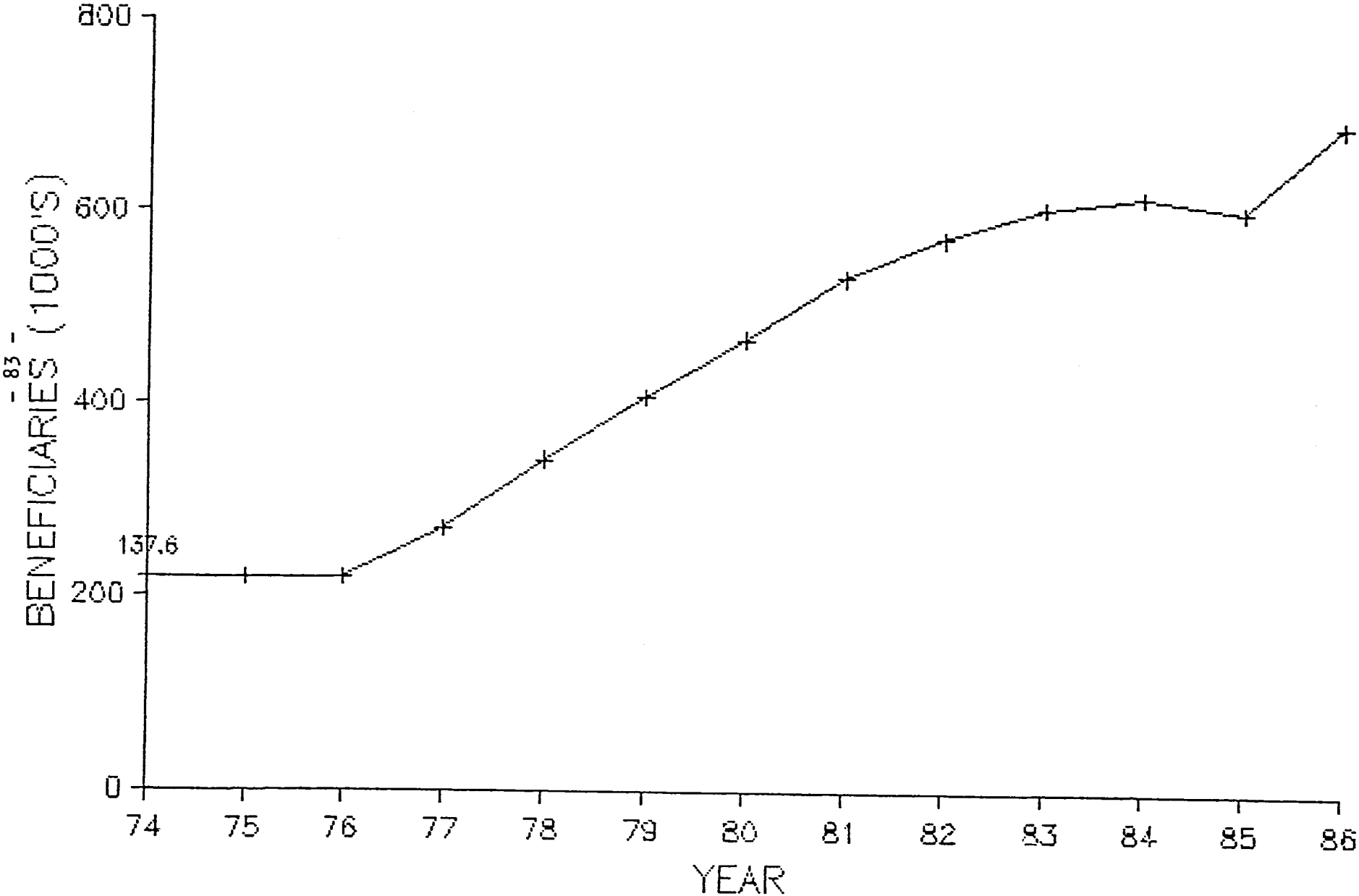


Figure 4.6

# TITLE II BENEFICIARIES
## HAITI, 1983-1986

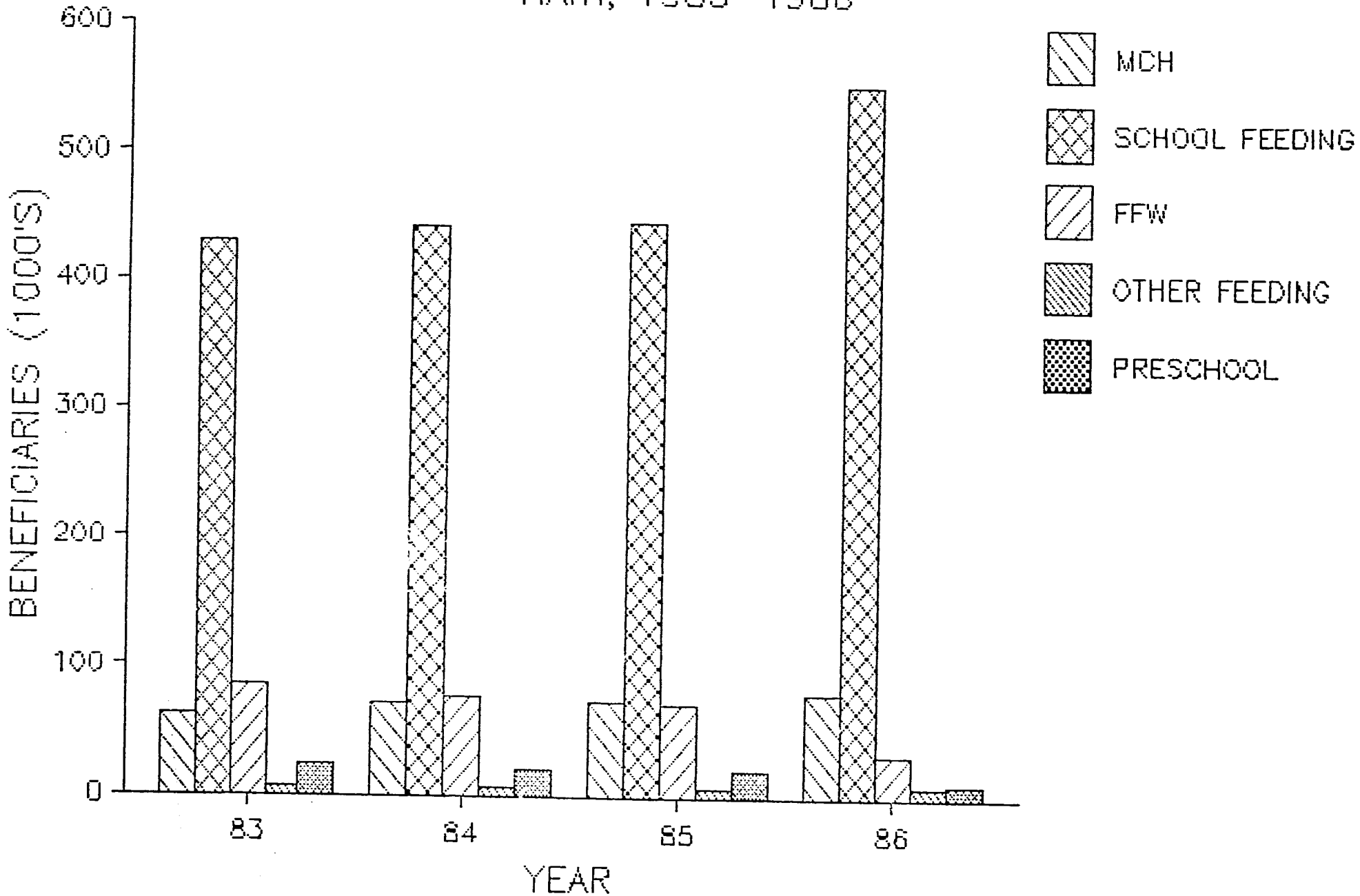


Figure 4.7

# TITLE II BY PROGRAM
## HAITI, 1986

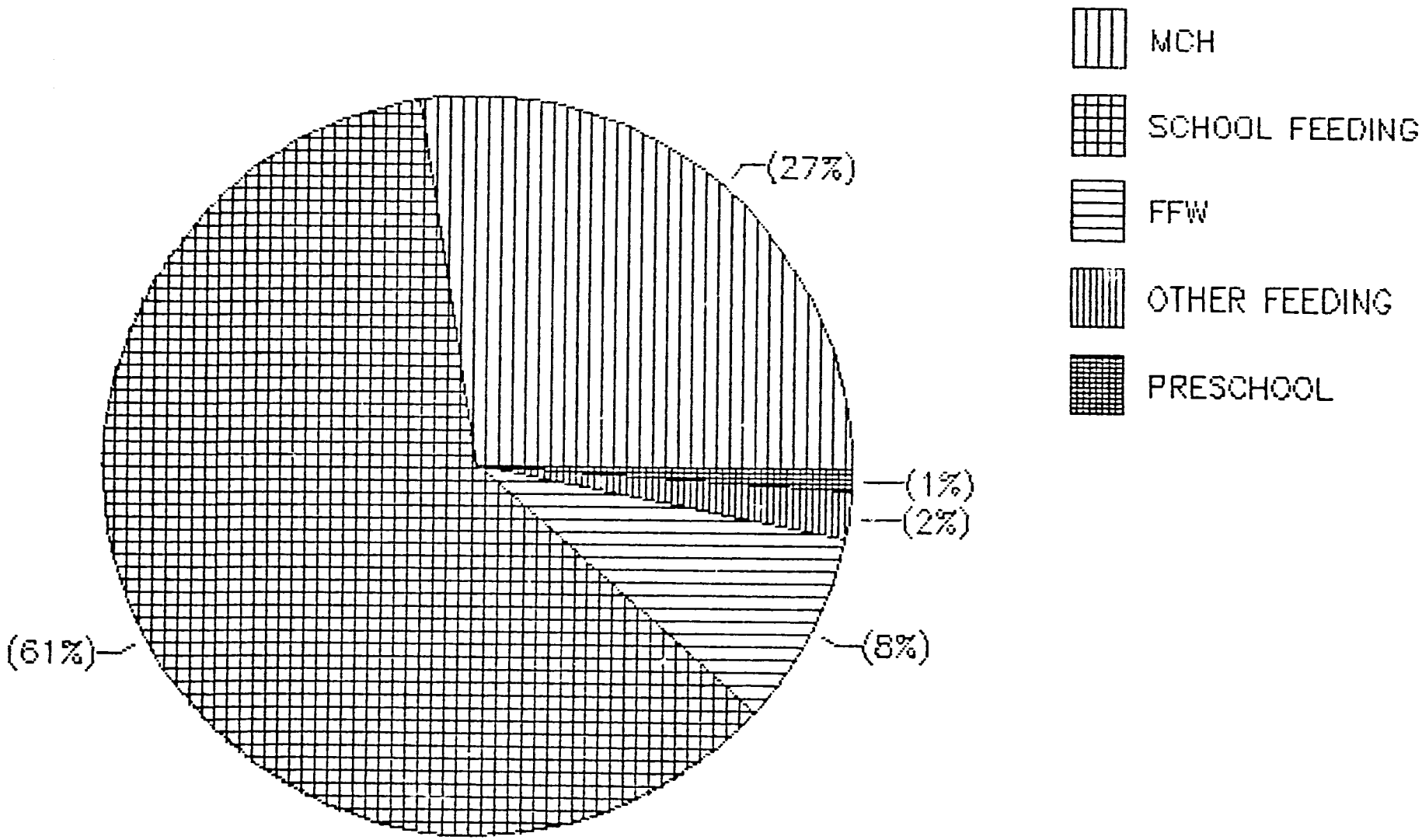
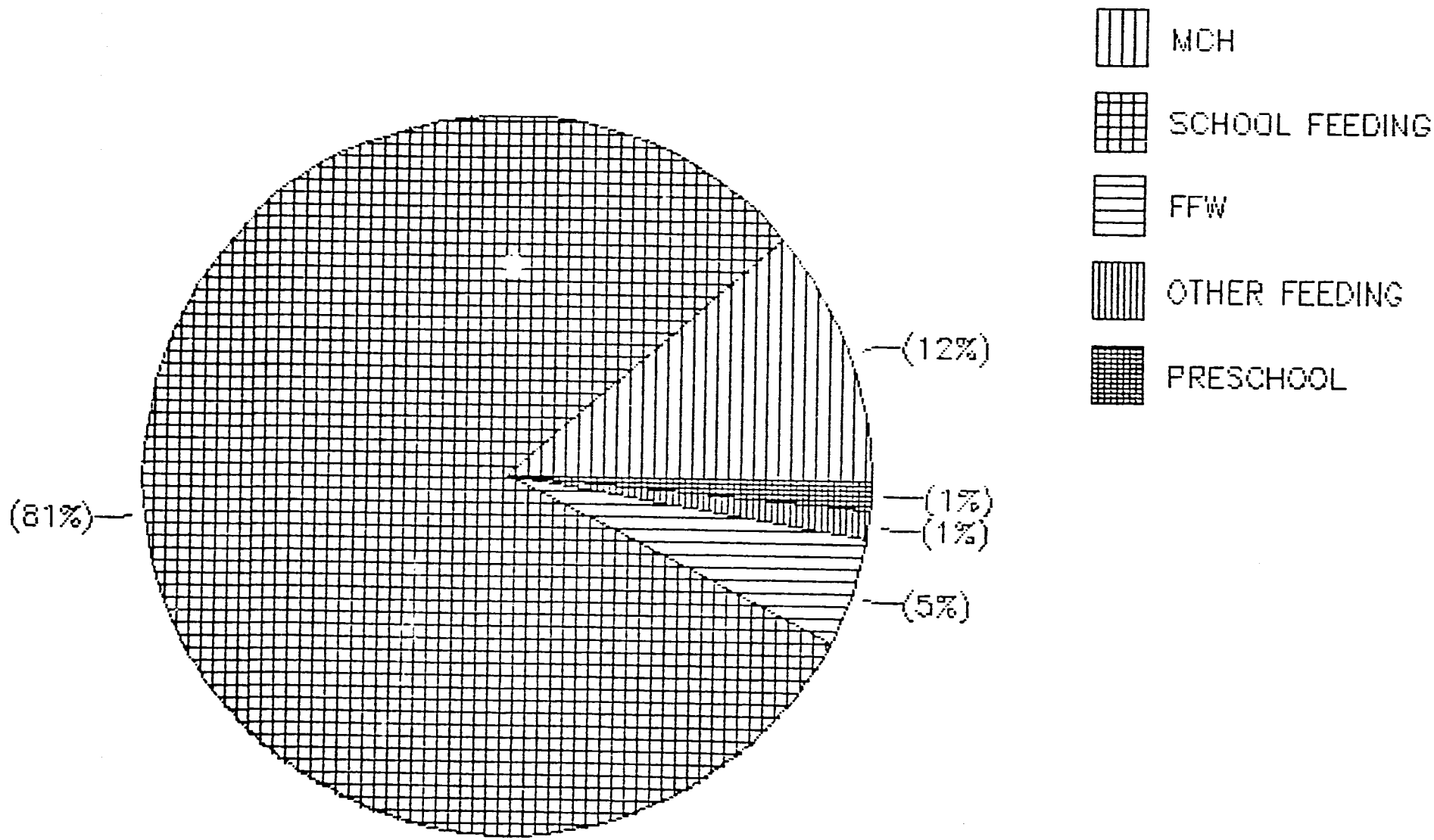


Figure 4.8

# TITLE II BENEFICIARIES
## HAITI, 1986



ADRA has chosen an approach to gaining local legitimacy that appears to be meritorious. They require that all FFW or MCH efforts be approached and monitored by a five member committee. The committee elects a president, secretary, and treasurer. The community must also have a warehouse that is rodent proof, capable of being locked and stored on pallets to prevent food spoilage.

The committee also monitors food distribution by compiling a list of names of potential recipients. Each recipient signs their name to acknowledge the receipt of food. Most of the committees do not include any church members. However, ADRA would like to have a church member on the committee in order to help insure greater compliance.

These local committees represent a vital component in food aid projects. They have the following important advantages:

- Placing the burden of insuring the integrity of effectiveness of projects at the community level.
- Establishing local sanctions to insure that project objectives are met.
- Cultivating local leadership skills
- Developing a community basis for coordinating several donors toward meeting community needs.

Such committees have enabled ADRA to work with UNICEF, for example, on a joint project. UNICEF has agreed to dig wells for several communities on the condition that roads are built by the community to provide access to the wells through FFW projects.

The PVOs have divided their responsibilities so that their efforts are focused on particular geographic regions. They appear to be coordinating relatively well thus insuring that food aid is effectively targeted. For example, CRS tends to focus on the South, particularly in the Les Cayes area. CARE has taken over the responsibility for food aid in the North, as ADRA has phased down its work there.

Yet, there is still a great deal of overlap in most geographic regions, but this does not appear to be a significant problem. In fact, some diversity of approaches undertaken by different PVOs in the same region would appear to be a strength. A greater variety of approaches provides rich experiences whose successes can be emulated while common problems can be identified and subsequently avoided. Moreover, each major PVO should be in a position to respond effectively and efficiently whenever local needs requires additional resources. Familiarity with community leaders, government personalities, and varying social and ecological conditions would insure greater PVO responsiveness in each

area. The cost savings from a regionalized approach is not obvious.

Some of the PVOs receive budget support from the GOH. This support is derived from local currencies generated by Title III sales. CARE received $425,000 last year from GOH which covered about one third of the costs of administering the implementation of food aid projects. Additional funds from the sale of empty containers last year amounted to around $40,000.

Table 4.3
Titles I & III Food Aid
(Metric Tons)

Concessional Sales of Agricultural Commodities to Haiti
Under PL 480, Titles I* and III*
and Section 416-Sugar Compensation*** Programs

| | 80/81 | 81/82 | 82/83 | 83/84 | 84/85 | 85/86 | 86/87 |
|---|---|---|---|---|---|---|---|
| Wheat | 29,674 | 59,287 | 39,614 | 47,889 | 80,535 | 143,784 | 106,387 |
| Veg. Oil | -- | 6,775 | 6,546 | 4,010 | 4,079 | 12,009 | 9,175 |

N.B. - All U.S. origin

*80/81 to 83/84
**84/85 to date
***85/86 and 86/87 only

## V. FOOD AID DISINCENTIVES: POTENTIAL AND ACTUAL

The threat of food-aid induced disincentives to the recipient country's agricultural production system remains a serious policy concern for USAID and the GOH.

The disincentive issue is particularly acute in Haiti because of the current political opposition to the food aid program. In addition to fulfilling Bellmon amendment requirements, clarification of the potential and any actual disincentives will be important in establishing an effective USAID dialogue with the new GOH. The purpose of this section is to bring to bear on the assessment of this issue the full range of theoretical and empirical studies that have been conducted on food aid disincentives. Subsequently, empirical analysis using available data will be conducted in order to bring greater clarity and understanding to the discussion.

### A. Aggregate Effects of Food Aid on the Economy

Two types of aggregate macroeconomic disincentives should be assessed. First, is the potential of a policy disincentive wherein the availability of relatively cheap food causes the government to give lower priority to investments in the country's agricultural sector. Second, is the possibility of price declines for major grains or other staples caused by the importation of large quantities of food commodities under concessional or grant terms. Each of these possibilities will be briefly assessed within the Haitian context.

#### 1. Policy Disincentives

The GOH has historically given inadequate attention to its agricultural sector. Declining agricultural productivity, the virtual absence of new technologies in agricultural production, and the glaring nutritional inadequacies of essential calories, vitamins and protein in the diet attest to the ineffectiveness of past policies.

Whether this lack of attention to agriculture is due to food aid imports appears to be rather unlikely. Historically, most food aid imports were targeted feeding programs under the direction of private voluntary organizations and the World Food Program. Only recently has the Title III component provided significant quantities of food into the Haitian economy. Even now, with food aid constituting as much as 10 to 15 percent of the caloric intake in the country, the prevalence of nutritional gaps of the magnitudes documented earlier in this report should have provided all the incentive needed to direct the GOH's attention to the agricultural sector.

The apparent consensus about the inadequacies of the GOH during the Duvalier era suggests that the past failure to address fundamental agricultural reform can be attributed to factors other than the existence of a food aid program. Agricultural policy reform must

be at the heart of the new government's economic and social policies. USAID's responsibilities must include concerted leadership to insure that potential policy disincentives do not emerge. There is little evidence in the economic literature that suggests that such policy disincentives have ever been significant. On the contrary, the rapid economic emergence of former food aid recipients such as India, Taiwan, and Korea may suggest the opposite - that food aid can be used as a powerful political and economic lever to direct resources toward agricultural reform.

2. Aggregate Price Disincentives

As the volume of food aid as a proportion of domestic production increases in a recipient economy, the relative price of food, particularly cereals, will tend to decline as well. This theoretical possibility generates concern that any price decline may reduce domestic production of food, assuming that farm production is responsive to market prices. This possible source of disincentives lends itself to empirical verification if adequate data bases exist.

Two decades of research on this issue, most of which employed a variety of econometric techniques, were assessed by Maxwell and Singer (1979). They concluded that price disincentives have been avoided in most countries through "appropriate" policy tools. Combining the 21 studies they reviewed with three known subsequent studies (Bezuneh and Deaton, 1985; Blandford and Von Plocki, 1977; and Hall, 1980) reveals that only six of the 24 studies report any significant disincentives. Four of these six were based on the Indian experience during the earlier days of PL 480, when the largest amounts of aid in history were being shipped. Of course, it should be clear that food aid as a proportion of total consumption is much higher in Haiti than it ever was for India. None of the recent studies found any disincentives. Rather, the studies of Bezuneh and Deaton in Tunisia (1985), and of Hall in Brazil (1980) reported evidence of significant positive growth effects in the broader economy.

These studies reveal two important, potentially positive, effects on the agricultural economy. First, food aid sales within the recipient country create a pool of financial reserves that can be utilized in such a way that growth in the agricultural sector can be stimulated. As one example, Hall reported that the government of Brazil gained revenues by selling wheat to mills at prices above the import price. These revenues were used, in turn, to subsidize higher price supports for domestic producers. Hall concluded that a sustained increase of 1000 metric tons of Title I wheat would result in a 108 percent increase in Brazil's domestic grain production.

A second and more substantial stimulus to the local economy is the increased purchasing power made available to households through relatively cheaper food. Greater food availability through food aid either dampens domestic prices, keeps them constant when they

would have otherwise increased, or slows down the rate of price increase. It should be noted that a price dampening effect alone does not constitute a disincentive for local producers. Consideration must also be made of technological change, population growth, exports and imports, and other factors affecting supply and demand. Under either set of conditions mentioned above, food is relatively cheaper with greater quantities available in the market, and more residual income is available for purchasing either more food or nonfood items. This so-called "income effect" is generally considered to be the most powerful but least understood effect of Title I/III programs.

Isenman and Singer criticized most previous econometric work on food aid price disincentives for ignoring "the dynamic effects of food aid on growth in output and employment and, hence, on demand for food grains in subsequent periods" (1977, p. 211). The recent assessment of Tunisia's experience also concluded that food aid had created a significant income effect that helped stimulate growth in the economy (Bezuneh and Deaton, 1985). Recognizing the power of the income effect, Mellor advocates using large food aid shipments to address pervasive nutrition gaps (1980). These studies recognize the need for concomitant policy reforms and the use of a well-tailored set of policy tools that sustain and direct the positive economic consequences of increased purchasing power.

### 3. Assessing Empirical Evidence on Price Disincentives in Haiti

Reliable data on prices, production, imports and weather are needed to make a thorough analysis of price disincentives. The previous analyses required time series data and were based on 2-and 3-stage least squares estimates of simultaneous equations. Essentially, a general equilibrium-type of system is needed to trace out the repercussions in the economy. Available data in Haiti were deemed inadequate for such an assessment of price disincentives. However, more simplified alternative analyses were undertaken which should provide an indication of any price effect that was of sufficient magnitude to dampen farmers' willingness to plant the same level of crops or to apply inputs at the same rate and intensity.

#### a. Food Aid/Food Prices Relationship

The food aid disincentive argument is based primarily on the assumption that the structural relationship between the quantity of food aid and local food prices is always negative. Thus, an increase in food aid will lead to a price reduction which, in turn, will lead to a decrease in food production in the receiving country.

This theoretical construction can be empirically tested by analyzing the functional relationships between food aid in grain (FA) and domestic grain price (PG), specified as:

$$PG = Ao + Ai\ FA,$$

where Ao and Ai are parameters to be estimated by simple regression. In the presence of a significant food aid disincentive, the coefficient Ai will have a negative value. When this equation is estimated, using available data on total food aid to Haiti and a consumer price index for food grain (for the time period 1976-85), the results are as follows:

PG = 116.88 + 2.94 FA, where r = .83 and the coefficient of determination, the proportion of total variation in domestic grain prices "explained" by variation in the quantity of food aid entering the country. This latter coefficient measures r2 = 69 percent, indicating a level of significance greater than 95 percent.

This positive relationship between food aid (FA) and domestic grain prices (PG) is the opposite of what would be found if price disincentives were being created. These results can be interpreted in one of two complementary ways. First, and more importantly, this could mean that food aid has an indirect positive effect on national income, perhaps through a strong income effect that stimulated demand and job creation, and that such effect enables consumers to maintain consumption at even higher market prices.

Secondly, this could mean that the same market forces which determine supply also influence food aid in a similar manner with a measure of political intervention of predetermined nature. If such interventions are fixed by an intergovernmental arrangement, then they may be represented by the positive constant term. In either case, the empirical evidence here seems to invalidate the disincentive claim for Haiti.

b. Food Aid/Domestic Production Relationship

Another approach to testing the disincentive hypothesis is to analyze the functional relationship between the quantity of food aid and the level of domestic production in the following year. This scenario assumes a lagged response to relatively depressed market prices. The hypothesis is that increases in the quantity of food aid will lead to depressed food production in the following year, other things being the same. This relationship is represented by: Prod. = Bo + Bi FA, where Bo and Bi are parameters to be estimated by regression. Again, the sign of Bi should be negative in the presence of measurable disincentives.

When the equation is estimated using the aforementioned set of data, the results are as follows:

Prod. = 446.06 + .349 FA, where r = .24 and the coefficient of determination is 5.9 percent.

Though it is not statistically significant, this positive relationship is consistent with the interpretation above.

c. Interpretation of Price Disincentive Analysis

Food aid increases do not appear to be associated with negative production responses in the Haitian agricultural economy. If anything, the opposite is more likely. Any interpretation of these results must recognize the extremely high prices that have historically prevailed in Haiti. Farm level prices well above world market levels have not led to substantial increases in agricultural production. Productivity per hectare declines as the acreage planted to grains increases, and farm inputs are not being utilized in any effective pattern to sustain production yields.

Such conditions weaken the fear of potential disincentives. Sustained injections of cost-reducing inputs would likely lead to greater food supplies and aggregate declining price levels even while incentives are preserved or strengthened. Even then, a well-tailored food aid program could be a positive stimulus for reaching low-income families and sustaining aggregate demand. Under current Haitian conditions, little likelihood exists that food aid will be a significant disincentive at the aggregate level.

d. Other factors influencing prices

Historically, the GOH controlled the price of flour and imported sufficient wheat to satisfy demand at the controlled price level, albeit a price level substantially above the world market price. Recent price competition due to contraband forced reductions in the price of flour by 30 percent and reductions of 50 percent in the price of rice. The recent contraband imports are a major factor that drive prices downward since their effect cannot be controlled by the government. Estimates of the magnitude of contraband are presented below.

Also, such factors as the massive reduction over the past decade in the number of hogs in the country due to the swine fever epidemic have major impact on the potential availability of grains. If one assumes, for example, that the number of hogs has declined from 800,000 to 175,000 and that each hog was fed one pound of grain per day, then the net addition to grain availability in the country, in terms of freed-up resources, is 103,693 metric tons (i.e. 625,000 lb/day x 365 : 2,200 lb/mt). In other words, the reduction in hog numbers may well have freed up farm resources sufficient to produce an amount of grain approaching the volume of total food aid and, for that matter, the estimates of total volume of contraband in wheat equivalent terms (see Section 3 for these estimates).

## B. Disincentives at the Local Community Level: Potential and Actual Impacts of Project Food Aid

1. Potential Impacts

Aggregate price effects depend critically on the level of food aid as a proportion of total domestic production. Similarly, project

level food aid may create price disincentives at the community level if food aid commodities represent a significant proportion of what would otherwise be taken off local marketing channels, or produced by local farmers. The ultimate effects depend on a myriad of community-specific conditions toward which the managers of food aid programs must be knowledgeable and sensitive. This knowledge can be obtained only by appropriate expenditure of time, talent, and financial resources. In other words, appropriate monitoring and evaluation of project food aid represents a significant resource commitment that must be traded off against resources which would otherwise be used directly in further project activities.

In addition to disaster relief and emergency assistance, project food aid includes Food-For-Work (FFW), MCH, SF and other institutional feeding programs. The distribution of large quantities of food commodities through any of these programs could have significant effects on local food prices, though such effects are easier to justify for emergency feeding programs than for others. Also, targeted programs for high-risk populations such as MCH, SF and hospital feeding programs appear less likely to affect local markets. Such programs tend to reach the poor who would be less likely to purchase food. The programs are more justifiable because of the ease of documenting the nutritional needs that exist and the positive gains that are measurable. These programs are less likely to displace other consumption from market channels, or to reduce the incentive of farmers to produce food because needy people are clearly being fed and the effect is observable at the local level.

In other words, these targeted population groups do not represent effective market demand and the food provided is mostly an addition to prevailing local levels of food consumption. The leakages from such programs into the local market through resale are very low and can be carefully monitored or simply prevented through appropriate food preparation and direct distribution, as in SF and hospital feeding programs. Most direct feeding programs, and certainly those in Haiti, include important nutritional education elements that provide important benefits which, in part at least, are sustained in the long run. As noted elsewhere, evidence of long-run benefits for Haiti is sparse, partly due to persistent low income levels that impede alternative purchasing decisions by consumers and growing decisions by farmers that in combination could reduce nutritional deficiencies.

## 2. Project Aid in Haiti

Jackson's critical assessment of project food aid in Haiti represents the classical treatise on the subject and a rallying point for food critics (1982). He reported that "In Haiti in 1978 officials estimated that between 50 percent and 80 percent of project food aid was sold" (p.87), and that surveys in the Northwest of Haiti estimated that food aid in the local markets comprised 25-40 percent of the total volume in the market at that time.

These figures in no way point to an actual disincentive for local food production. Depending on the growing season, a large volume of food aid in the local market could reduce local market prices and reduce the profits of local merchants and perhaps lower the local purchase prices of farm produce. The above figures do not indicate how large the volume of food or food aid was in those local markets, a critical consideration for understanding the creation of a price depressing effect, as pointed out earlier, even a sharp, but temporary, price depressing effect would not represent a disincentive to local producers.

Imperfect local markets appear to prevail in rural Haiti. High transportation costs create major barriers to market flows in the rural areas and establish "fences" around local communities within which market forces work themselves out. Such conditions create a double-edged impact whereby a large volume of project aid could reduce local farm prices while simultaneously greatly expanding local consumption levels. The high income elasticity of demand for food among low income families (in the 1.0 range) insures that reduced prices are realized as proportional income gains. These income gains subsequently lead to gains in purchasing power and increased food consumption.

Project food aid disincentive effects can be measured only when careful statistical analysis is made of both the household production and consumption changes that occur. Only two known studies have attempted to capture these effects at the household level. Evaluation studies of WFP projects were undertaken by the International Food Policy Research Institute (IFPRI) in Bangladesh. Their results point to important gains in the income levels of FFW participants, part of which came from the greater farm production of FFW participants.

Reports on a WFP supported FFW project in Kenya provide additional evidence of significant gains in household income and farm production capacity (Bezuneh, Deaton and Norton, 1988; Deaton and Bezuneh, 1987). The following conclusions were drawn from their research:

1) Food aid relaxed the capital constraint for local producers resulting in a 52 percent increase in net farm income. Most of this increase was due to the induced effects of capital formation on agricultural production. Further income gains can be expected in subsequent years due to the compounding effects of capital formation.

2) Food aid stimulated farm production so that available slack resources were used more effectively, particularly land and labor, thereby increasing employment 93 percent above the direct employment in the FFW project itself.

3) Food aid increased household income which, in combination with the distributed food commodities resulted in 42 percent more fat

consumption, 26 percent higher calorie consumption, and 16 percent higher protein consumption than non-participants.

4) Food aid benefited the poorest households most of all. They tended to participate more in the FFW project which created more equal patterns of income distribution and improved their nutritional intake relatively more.

5) Food aid improved the nutritional intake of participants more than did its cash equivalent. Food aid laid the foundation for economic development that could eliminate the need for food assistance in the long run.

6) Food aid stimulated own-farm production and created less dependency on outside aid donors, contrary to commonly-held fears.

While the reader must guard against over-generalizing from the results of this case study, the potential benefits of FFW must not be ignored. The Kenya results show that positive economic development can be achieved if the leadership and administration wherewithall is marshalled to carry out the project. Salient principles must be identified from successful projects and applied in new projects.

### 3. Haitian Project Disincentives

While no hard evidence is available to determine whether or not local disincentives occur in any systemmatic pattern or currently prevail in Haiti, a general discussion of impressionistic information is appropriate. The above discussion of potential impacts may help provide guidance to future food aid programs in Haiti. A further purpose here is to identify conditions that help guard against project-created disincentives to local food production.

A number of persons expressed the opinion to the research team that disincentives have occurred under certain conditions in some communities at particular times. From our discussions, it appeared that the concept of "discentives" was interpreted in a variety of ways. No one believed that farmers had actually reduced their level of farm production due to temporarily lower food prices in the local market. More than one person cited examples where local people did not want a certain type of program and interpreted these as evidence of discentives. The Northwest, for example, doesn't want FFW programs; and at least one community in the South rejected a SFP because local mothers decided instead to purchase food on their own from the local market and prepare it for sale to the school. While the latter may, on the contrary, represent an interesting example of a perverse incentive system, the rejection of FFW most likely reflects powerful political and cultural opposition to U.S. policies and a perceived "welfare" system of food distribution. Understanding the basis of this sentiment is essential to the vitality of future food aid programs in Haiti and will be discussed in more detail in the next sub-section.

A more substantive concern expressed was that generally dampened food prices will not provide an effective environment for promoting sustained productivity in Haitian agriculture. This issue must continue to be carefully assessed in formulating future AID strategies and in promoting policy reform with the GOH.

4. Principles to Guide Future Food Aid Programs

Food Aid programs interact with government pricing policies and marketing strategies. USAID should be sensitive to this interaction when strategies and in promoting policy reform within the GOH.

a. Pricing Policies and Technical Change

Sustained agricultural productivity is a precondition of economic growth. Increasing agricultural productivity results in secular declines in the prices of agricultural commodities. Sustained incentives for farmers under conditions of economic growth require a balance in pricing policies and technological change. Steadily declining food prices and the consequent welfare benefits that accrue to all consumers can be realized only with sustained injections of new knowledge and technologies into the agricultural sector. New inputs, including credit and a quality work force, must be combined with advances in marketing efficiencies agricultural research, communications systems for agricultural extension, etc.

Accumulated local currencies under Title III provide a resource base that can be directed toward new technology creation and dissemination. A broad range of infrastructure must be supported to insure rationalized markets in both the input and output side which stimulate lower cost production of food.

Following the Brazilian example, food aid sales at above import prices may be able to provide revenues to a government marketing agency which could be used to subsidize farm level production. This approach would insure low consumer prices while incentive prices are provided to farmers.

b. Structuring Project Aid to Avoid Disincentives

At the community level, project food aid must remain sensitive to seasonal availability of food and cyclical demand for labor in farm production and marketing. Although, FFW particularly should be managed to avoid competing with other demands for labor, it is unlikely that food commodities are preferred by participants over the cash wages. The important objective is to insure that FFW is used in a developmental context. The FFW projects will be most successful when the families of landowners provide labor for developing income-producing assets from which local producers will benefit. Whenever public works projects are planned, then the project should insure that the public truly benefits, with equal access to project benefits insured to all members of the community.

The USAID Mission personnel and PVO leadership are split on whether or not to continue with a FFW program. While recognizing the many liabilities under which FFW must labor in Haiti, our assessment is that the program should continue under stringent planning and implementation guidelines - conditions which appear to be acceptable to PVOs and to recipient communities. Integrity of program administration must be insured, and effective articulation of program benefits must be undertaken. The latter will not be easy under conditions of widespread suspicion and political uncertainty. A few successful case study results must be identified and/or generated through successful projects in Haiti in order to help turn the tide of negative opinion about FFW. If conditions are so negative that such positive results can not be identified or quickly realized, then termination of the program should be considered.

Our understanding is that several successful FFW projects have been implemented in Haiti by CARE, ADRA, CRS, and WFP. The most successful of these should be carefully evaluated to validate their successful results and to provide sound principles for further project development.

Emphasis is placed on FFW because of the significant needs in Haiti for community and household capital formation, job creation, and sustained income generation, all of which are potentially realizable under FFW. No clear alternative source of resources for achieving such results is evident. Accordingly, innovative program design should be sought to identify project efforts and administrative approaches to enhance the potential of such projects. Combinations of cash and food based on prevailing minimum wages may help to insure that such projects as tertiary road infrastructure in agriculturally productive, but remote, areas of Haiti can be developed. Strong and dependable local leadership, strengthened by the potential resources created by the 90 percent retention of local taxes by "communes," may provide great opportunities for new initiatives under FFW.

The January 1988 decree on fiscal autonomy for the counties which allows them to retain 90 percent of local taxes provides a basis for local "counterpart funds" to supplement FFW in the implementation of locally identified and managed projects (Bailey Memo of 2/3/88). A careful assessment of the fiscal potential by locale should be immediately undertaken. Workshops should be established so that local leaders can voice their opinions about the range of projects, administrative approaches, and implementation strategies that could be undertaken with PVO and WFP coordination. A new era in "food-for-development" could be initiated under the new fiscal rules being established in the country. Sensitivity and care must be exercised in order to nourish these new beginnings and prevent abuses due to excess eagerness.

## VI. CONSIDERATIONS FOR COUNTRY DEVELOPMENT STRATEGY STATEMENT (CDSS)

Critical interrelationships between nutrition and agricultural production should be carefully evaluated as the new CDSS is developed. Along with the aim of sectoral balance in the overall macroeconomic strategy for Haiti, a rigorously measured set of steps toward achieving food security must be established by USAID. Such a strategy must be based on a carefully conceived plan of agricultural diversification and community level food preservation and storage. The latter may be quite important in the short-run, until market reform and transportation are sufficiently improved. A major challenge to USAID and the PVOs is to generate a positive, developmental role for food aid. This will require that its potential for generating human and physical capital assets for the country be fully recognized and objectives specified, measurable targets established, and that the food aid be programmed to achieve these objectives.

### A. Food Aid Levels and Mix

The food aid program level and its role in a broader agricultural development strategy in the country must strike a balance between meeting the needs of rural grain producers and principally urban consumers.

This is not substantially different from the balancing act that has been followed by governments of most of the world's food exporting countries. On the other hand, the needs of both producers and consumers are far more acute in Haiti than in most countries and available policy mechanisms appear to relatively underdeveloped and pooorly understood.

The substantial food gaps revealed in this analysis will be very difficult to meet even with various combinations of Titles II/III. More emphasis on Title II would insure direct targeting to needy population groups, and would also reduce the relative control of the program by the GOH. Title II also increases the potential for introducing a wider variety of food commodities into the program including locally grown food crops.

Our analysis of the data on domestic production provides no reason that would limit the importation of food aid to wheat, bulgur, soybeans and dairy products. Corn, for example, could be added to the mix particularly for targeted programs at the community level, probably without disturbing the domestic market for the product. The rapid price increases over the past decade for domestically produced grains indicate that careful programming of corn could be undertaken, as far as price-quantity relationships are concerned. Most corn is grown for self-sufficiency, including its use for livestock feed.

Two serious aspects of adding corn would have to be considered. First, political sentiment would likely be very critical toward the PVO's and the U.S. because of perceived competition with Haitian farmers and fear of the potential price disincentives associated with this. Fear of local production disincentives has become an important political agenda of some groups in the country, in spite of little hard evidence of any problems

with disincentives. Second, U.S. corn may not be as desirable for human consumption. Perhaps fortified corn meal for targeted FFW programs, MCH, and SF and Hospital feeding, would be a reasonable addition. Overcoming these obstacles would be the task of local PVO field staff. The political costs of such an approach may be higher than the benefits.

All the PVOs in Haiti appear to face serious budget constraints and are turning toward USAID for program support from Title III counterpart funds. Quite likely the GOH will resist significant increases in the use of counterpart funds for PVO support. USAID faces the need for balancing Titles II and III to insure effective support of PVOs and to generate sufficient counterpart funds to carry out related developmental objectives in the country.

In view of the delicate political situation in Haiti and the budget constraints faced by PVOs, it is likely that the WFP will take on a more assertive and expansive stance. The WFP is closely linked with and dependent upon the bureaucracy of the GOH. As the GOH attempts to strengthen its legitimacy in the country, WFP could be an essential ally in this process. Such a prospect places renewed emphasis on careful advance work at the community level and substantial oversight and monitoring. These factors will create an uneasy environment for USAID/PVO Title II efforts.

## B. Defining a Developmental Role for Food Aid.

The previous section identified three important components of a developmental food aid program:

1. A macro-component that recognizes the positive impact of greater consumer spending created by relatively lower food prices. In order to capture the full potential of these effects of large shipments of food aid under Titles I/III, responsive investments must be made by either the public or private sector to create new jobs and provide a wider range of consumer goods, higher quality foods, and agricultural inputs.

   A well-defined investment strategy to insure that these benefits are achieved should be delineated in any future CDSS. A stable political and economic framework will be essential to attract foreign investment and to encourage domestic entrepreneurs to invest in the future of Haiti. A flow of new technologies into the country should be insured in order to maximize the rate of return on both private and public sector investments.

2. Project-level impacts of FFW projects that generate permanent income streams to participants and to the community. Participant benefits are generated directly when owners of small farms are involved in the FFW project themselves. This insures greater loyalty to the FFW project and helps enforce proper management and control over project resources and personnel. The wage-equivalent earned on the project provides more capital for the farm operation of the participant, through food-wage substitution. New inputs and more hired labor help

expand the capital base of the farm and insure greater earnings in the future on a more sustained basis.

Community infrastructure created by the FFW project should be designed so that the productive capacity of local producers is enhanced. The benefits that flow to local producers and consumers should be clearly recognizable as a condition of project approval. Soil and water conservation, farm-to-market roads, food storage facilities, and land development are all examples of such projects that create new productive potential at the farm level.

3. The nutritional and health benefits that accrue to the population under all food aid titles. These benefits represent a third important developmental impact of food aid and are more directly observable in targeted feeding programs under Title II. However, these benefits may not be sustainable unless a broader developmental strategy, often supported by a larger Title I/III program, is simultaneously undertaken.

   Feeding programs create new human potential. Food does not just disappear into an inert consumer. The renewed potential of the human agent that stems from feeding programs creates vital resources whose self-interest becomes that of further insuring the permanency of the nutrition stream. This translates into powerful incentives for economic development. In this sense the moral, political, and economic motivations underlying food aid programs merge to help release the latent human potential upon which social and economic progress depends.

## C. Components for Program Success

Given the very negative feelings which surface in most conversations about food aid in Haiti; program administrators face severe obstacles in convincing the GOH of the developmental role that food aid could, and perhaps is, playing in the country. It is unlikely that food aid will become an effective developmental tool unless all parties are convinced of its potential effectiveness. A number of steps could be taken to strengthen this perception of food aid:

1. Phase out the Program - Serious attention could be given to establishing a plan for phasing out the food aid program, particularly Title III, over a sufficient number of years to insure that food needs are met by the expanded economic capacity of the country. Such a phase-out strategy should be undertaken only within a carefully drawn up plan for achieving food self-reliance based on expanded capacity for domestic food crop production and expanded export crops for generating needed foreign exchange. Therefore, a phase-out of food aid must be linked with the agricultural/economic development strategy of Haiti. This would send a strong message to the GOH about the developmental role of food aid and lead to serious analysis of food aid as a real resource for development.

Any food aid phase-out strategy which utilizes progress in economic development as a criteria, must not be based on an assumption that increased economic development at the national level will automatically solve problems of malnutrition for the masses. Several developing market economy countries have made major economic strides over the last few decades, however economic gains have not been equitably distributed. Consequently, for many countries malnutrition remains a major public health problem among the poor, and they are still in need of food aid.

Even if national economic growth leads to economic gains for the poor, there will most certainly be differences in the expenditure patterns between families and even between family members. Reportedly, in poor families, income controlled by the mothers is more likely to favorably influence nutritional status of children than income controlled by the fathers. Therefore, in addition to establishing a baseline against which economic progress can be measured, it is also desirable to establish a parallel baseline to measure progress toward eradicating malnutrition.

A national baseline survey of food program participants should be undertaken to obtain information on family size and make-up, food aid use at the household level, other food resources, incidence of malnutrition, income and income potential. Information obtained could be used not only to establish reasonable nutritional milestones to direct prudent food aid phase-out, but also to guide the formulation of nutrition education policies and programs.

A baseline should be established against which progress in economic development could be measured. Such progress would incorporate the positive development effects of food aid based on analyses of the income-effect of Title III, the project impacts of FFW, and the increased human capital from direct feeding programs of Title II. An effective annual growth rate attributable to food aid injections could be realized in perhaps five to ten years. Thereafter, a slow phase-down could be scheduled so that food aid would not be needed after perhaps 20-30 years.

While the level of Title II programs could be somewhat reduced, it is unlikely that the need for such programs will be eliminated over any reasonable future time frame. Title II could continue to play a longer term role that would ease the burden of social welfare expenditures for Haiti for the foreseeable future. Rather costly feeding programs continue to play a major role in meeting food needs in the U.S. and in other industrialized countries. Haiti is unlikely to be an exception to such needs even under the most optimistic projections.

2. Establish Pilot Projects - Carefully monitored pilot projects should be initiated with the multiple purposes of:

   - demonstrating the potential development impact of the project
   - discovering key implementation principles that could be emulated in other projects in the country

- training field personnel in effective management techniques
- delineating the linkages with other agricultural development strategies that are essential to project success
- providing models for successful projects in other parts of the world

Pilot efforts recommended for further consideration are the following:

a. School-Based Economic Development

Through program efforts that combine SF and FFW, entrepreneurial training and enterprise development could be introduced into secondary school programs. This pilot effort could use FFW to achieve desirable levels of labor input into small businesses, perhaps further processing of agricultural or natural resources (i.e. value-added businesses). A small capital fund could be established through counterpart funds in order to provide start-up, risk capital for the new businesses. Small agricultural enterprises could also be initiated in this way.

The Grameen Bank in Bangladesh has demonstrated the success of providing small loans to low-income people to create new businesses. This idea should be explored and, insofar as possible, the general principles from this successful effort should be emulated.

b. Target Remote Communities and the Most Needy

Many hard-core poverty areas of Haiti suffer disproportionately from hunger and malnourishment. Attempts to address the needs of such communities often cost so much that other equally worthy projects suffer. A hard economic calculus is at work here which leads PVOs and USAID to be cautious about cutting back on funds to worthy projects in the name of noble attempts to reach the "poorest-of-the-poor."

However, a pilot effort to reach some of the remote areas with an effective feeding program would provide important learning experience while addressing critical human needs. The management and logistical expertise that would be gained would carry over to other projects in Haiti and would likely be cost-effective in terms of improved efficiency of food aid programs.

None of the existing programs appear to meet the needs of the bulk of the rural, poor children of Haiti. Some benefits flow from FFW and MCH, though these are restricted by program guidelines as pointed out earlier. Attention should be given to expanded MCH programs which address the needs of all children in recipient households focusing particularly on child-survival strategies. A significantly expanded MCH program would have multiple benefits because of the health and nutritional gains that could be achieved by the educational components of MCH. This program appears to have the greatest potential of meeting the needs of the poorest of the poor.

USAID, PVOs, and GOH should evaluate possible alternative strategies for more nutritionally efficient targeting. The targeting should take into account the proportions of food aid commodities used for the Title II programs in relation to the nutritional needs of the participants. For example, currently 80 percent of the Title II participants are school children while the most nutritionally vulnerable children are preschoolers. Nutritional improvement for the most malnourished and younger age groups may be double that of the moderately malnourished and older age groups for a given volume of food aid.

The SFP "inverse targeting" (Cotten, 1983) of the relatively better off schools should be evaluated to determine how to reach more disadvantaged schools. New strategies should be developed to reach the majority of the rural children who are not attending school. Geographical locations such as the northern region and other rural and urban pockets of malnutrition/poverty should be identified for current and future programming.

A specifically targeted and carefully managed feeding project for preschoolers designed to prevent malnutrition through promoting a "new tradition" of feeding habits, child-survival strategies, and environmental sanitation in selected communities should be conducted. This approach tests the use of food aid as a preventive tool for malnutrition in addition to its current use of being curative. Low-income mothers and infants would be provided supplements during time periods of high nutritional need (children 6-23 months) and after that time when nutritional surveillance indicated a need. An active educational component would promote the new tradition of feeding habits, health and environmental sanitation. To provide support for improved environmental sanitation conditions of participating households, FFW could include activities such as: wells, latrines, fuel efficient cookstoves, and facilities for livestock. This pilot project's secondary objective would be to test the effectiveness of integrative food aid programming to meet targeted household nutritional needs.

c. Toward Sustainable Agriculture

Severe soil and water management problems plague Haitian agriculture and impede the adoption of new technology. Many types of new technologies are not cost-effective because of the ecological problems associated with their adoption. The high cost of fertilizers and other new technologies further impede technological change in Haitian agriculture.

A new set of technologies have emerged under the rubric of "sustainable" or "regenerative" agriculture, generally associated with scientific work undertaken by the Rodale Research Center in Emmaus, Pennsylvania. The Rodale experience suggests that a "sustainable" system of agricultural production with a level of productivity equal to that of a chemically-dependent system can be established over a five-year period. The new "sustainable" system depends on natural microbial and chemical balances in the soil stimulated by

various types of crops in intercropping systems and by crop rotation systems.

During the five-year transition period, the level of crop production may fall before it regains its original level of production. Herein lies the basis for introducing such a system on a trial basis in Haiti. A carefully-selected community where a PVO has a sound track record and good management would be an important prerequisite. Working with Rodale scientists, pilot projects could be undertaken, perhaps drawing on FFW to encourage local participation. A food-aid supported food bank would have to be established (or drawing rights on an identifiable reserve stock) in order to insure local farmers of a food supply at least equal to some historical trend level plus some additional incentive food supply.

Such a pilot effort would have the potential of finding some long-term answers to agricultural conditions in Haiti. Perhaps a productive system of agriculture based on soil-building principles and lower-cost inputs could be developed. A basis would also be provided for testing the principles and ideas underlying the Rodale approach. This pilot effort would entail a three-way partnership between a PVO, USAID, and Rodale. Community leadership in Haiti and an impartial researcher would also need to be involved. This pilot effort would require additional resources, but could have high pay-off over the long run.

d. Nutrition Education and Surveillance

Maximum management of nutritional resources is essential among poor families. Nutrition education should be an integral and integrated component of food aid programs. In a study in a Jamaican parish where resources are severely limited, nutrition education without resources supplementation was shown to be more effective toward rehabilitation of malnourished children than supplementary income without nutrition education (Rankins, Maloney, Rainford, and Hopkins, 1987).

While nutrition education has generally been directed toward mothers, one study conducted in Haiti (Webb, Darby, Ballweg, and Fougere, 1982) showed that fathers are also receptive to nutrition information as well as its application. These same investigators (1985) have reported a successful strategy for reaching both mothers and fathers by combining nutrition education with agricultural training. Special programming efforts such as radio or distance teaching programs should be developed to reach the masses of rural poor not currently participating in MCH, SF, or FFW with relevant agricultural production, nutrition, and health information.

Coordinated nutrition education curricula should be developed, tested, and implemented for school feeding, pre-school, and food for work programs. Mechanisms for monitoring impacts should be embodied into its design. A consortia of nutritionists from among

food aid donor countries, government, PVOs, and the private sector should be organized to execute the recommendation.

e. Nutrition and Farm Production

In labor intensive agricultural systems such as those of developing market economies, caloric requirements for energy expenditure are high. The following example illustrates relative differences in caloric requirements of exceptionally active farm workers compared to their moderately active counterparts by sex and selected age groupings.

| | | Recommended Energy Intakes[1] (cals) | |
|---|---|---|---|
| Age | Sex | Moderately Active | Exceptionally Active Moderate x 1.34 |
| 10-14 | M | 2750 | 3685 |
| | F | 2420 | 3243 |
| 15-19 | M | 2985 | 4000 |
| | F | 2400 | 3216 |
| 20-39 | M | 3000 | 4020 |
| | F | 2200 | 2948 |

Donor organizations, government policy makers and farmers in Haiti and other parts of the world must appreciate the interdependency of nutritional status and agricultural production. Nutritionists have failed to illustrate the importance of this issue because of limited quantitative cause and effect data. There is an important need for a research project designed to measure the impact of meeting caloric and associated nutrient needs of farmers through food aid on their long term food production. Benefits of such a research project are two-fold because, during the course of generating the data, agricultural production is likely to significantly increase also.

[1]Recommended Dietary Allowances for the Caribbean

## D. Development Training for PVOs

Discussions with PVO representatives and USAID confirmed the need for more extensive training of field management personnel in economic development. It was generally recognized that food aid could not be effectively programmed to achieve economic development objectives unless the potential for food aid use in development is understood. A commitment to the development objectives and an understanding of the need for establishing a framework for guiding the planning and implementation phases of food aid programming must be established. Training approaches consistent with the "Third Generation Strategies" advocated by O'Connor (1987) should be carefully evaluated.

The PVO community in Haiti should be encouraged to coordinate their training efforts with USAID and with GOH personnel to insure a common understanding of the role of food aid in economic development. Problems of training and logistics, computer-aided decision making, community organization, and resource identification are among the practical skills that could be incorporated into such training sessions. More critical, however, is the need to understand the linkages between nutrition and health and the accumulation of human capital; the savings, investment, and consumption decisions made by households that alter the developmental potential of small-scale farms and rural communitites; and the processes through which community infrastructure can foster regenerative economic growth.

Training programs built around these concepts and practical skills would be particularly effective in strengthening FFW projects by insuring greater acceptability in local communities, providing a defensible rationale for FFW which counters the opposition of many critics in Haiti, and ultimately insuring that the food resources, indeed, address the fundamental needs of the Haitian society.

A developmental approach would also provide a conceptual foundation for enabling the various PVOs to work together on common projects, to coordinate activities within and among communities, and to insure that component SF, MCH, and FFW projects have a cohesive focus whose synergistic effects are realized as a result of human and physical capital formation.

## E. Coordination Within USAID Mission

Concerted efforts must be sustained within the USAID Mission to foster joint programming among the agriculture, education, and health offices. Some of the greatest advances in food aid programming can be achieved through coordinated project development based on the knowledge base that experts in each area can bring to the subject. The pilot projects advocated in the previous section of the report will require sensitive, knowledgeable expertise in education, health, and agricultural development. Personnel from each of these offices should be included in PVO training programs so that cohesive planning can be encouraged.

Appendix 1

List of Individuals Interviewed

1. Lance Jepson, Supervisory Agricultural Development Officer
2. Janice Wescott, Title II Program
3. Ed. Clarke, Chief Mission Economist
4. Martial Bailey, Title II Importation and Financial Arrangements
5. Dr. Michaelle Gedeon, Nutritionist
6. Alix Tracy, Grains-Cereals-Degrees
7. Paul Freney, World Food Program, Adjoint Representative and Chief of Operations
8. Ginette T. Merentie, PL 480 Title II Program Manager
9. Claude Grand Pierre, Ministry of Planning
10. Michelet Fontaine, Project Officer/ARDO
11. Guy Beaulieu, National Director of Agricultural Development Support II Project (ADS II)
12. Dr. Joseph N. Pierre, Agr. Specialist (on contract w/University of Arkansas)
13. Ernest Dupont, Director of Agr. Statistical Servicea and of ADS II Statistical Programs
14. Valbrun Jean, Agronomist Responsible on site at Jacmel
15. Amal Chatterjee, Agronomist (on contract with Winrock International in Les Cayes)
16. Dr. Louis J. Noisin, President Fondateur/University Roi Henri Christophe, Cap Haitien
17. Agr. Jean Nicole Jean-Louis, Directeur General de l'Organisme de Development du Nord (ODN), Cap Haitien
18. Volny Paultre, Directeur General de l'Organisme de Development de la Vallee de l'Artibonite (ODVA), Saint Marc/Ponte Sonde
19. Ing. Rony Grand Pierre, Directeur Division de Genie, ODVA, Saint Marc/Ponte Sonde
20. Orval Scully, Director Adventist Development and Relief Agency (ADRA) (SAWA), Port-au-Prince
21. Jacque Montouroy, Directeur Adjoint, Catholic Relief Services (CRS) USCC
22. Carol Laurent, CARE
23. Lutful Gofur, CARE
24. Marcel Augustin, Agronome de District, Port-au-Prince Sud
25. Camille Dorcin, Conservationiste, Port-au-Prince Sud
26. Ducarmel Francois, Engineer, Port-au-Prince Sud
27. L. Kastov, FFW Project Director, Artibonite Valley
28. Fabrizio Eusepi, Associate Expert, Artibonite Valley
29. George Prophete, Custom Officer in Cap Haitien
30. Agr. Brunel Garcon, Director General of the North
31. Agr. Lionel Valbrun, Agr. District of the North
32. Agr. Emmanuel Prophete (M>S> Texas A & M), Chief of Operations
33. Agr. Eberle Nicolas, ODN/MARNDR
34. Tobey Pierce, Agricultural Economist and Technical Assistant to MARNDR
35. Anne Tremblay, Consultant to MARNDR
36. Quentin Grafton, Project ADS II/Director in Les Cayes
37. Eddie Walters - Economiste Agricole ADS II, Les Cayes - Assistance Technique/Economiste Agricole
38. Serge Eidme, Argonome ADS II, Les Cayes

39. Steve Reddie, CARE, Les Cayes
40. Bob Klockow, Peace Corps Volunteer (would be agronomist), Les Cayes
41. Rosenor Rosembert, Farmer and Local Seed Multiplication, Coop President (Near Les Cayes)
42. Armand Cadet, Moniteur/Farmer (Cap Rouge area)
43. Leuva Lensil, Moniteur/Farmer (Cap Rouge area)
44. Jean Baptiste Azor, Moniteur (Cap Route area)
45. Bento Jeanty, Moniteur (Cap Route area)
46. Farmers (more than 100 farmers and local residents were interviewed formally or informally through normal conversations)
47. Stephanie Seguine, Agricultural Economist, USAID/Haiti
48. John Horton, Private Enterprise Development, USAID/Haiti
49. Michael White, Supervisor, Health and Nutrition, USAID/Haiti
50. Gordon Prouty, Food For Peace Consultant, USAID/Haiti
51. Barry Heyman, Supervisor, Title II Program, USAID/Haiti
52. Gerald Zarr, Mission Director, USAID/Haiti
53. Dana Fisher, Education Officer, USAID/Haiti
54. Giovanni Caprio, Economist, USAID/Haiti
55. Thomas King, Rural Development Officer, USAID/Washington, DC

## Appendix 2.1

## Caloric Conversion Rates

After the net availability of food items is calculated then the calories per kilogram are calculated using values from the Caribbean Food and Nutrition Institute (1974).

In cases where the food balance sheets list several food items together such as fruits, then an average figure was estimated using the proportions of food items listed in the FAO 1983 food balance sheet for the category of food. Conversion factors were also estimated by comparing with those used by Beghin et. al. (1970) in a similar estimation and against general ones suggested by Tuck (1985).

Conversion rates are as follows:
kcalories per kilogram of selected foods

Rice (3623)
Maize (3602)
Sorghum (3423)
Potatoes (695)
Sweet Potatoes (968)
Cassava (1085)
Yam (1085)
Other Roots and Tubers (983)
Beans (3366)
Plantain/Bananas (714)
Pulses (3366)
Beef (2136)
Mutton (1941)
Goats (1460)
Pigs (pork med. fat) (2339)
Bacon and Ham (2156)
Evaporated Milk (1377)
Chickens (1473)
Other Eggs (1448)
Eggs (whole) (1448)
Ducks (2081)
Geese (2083)
Turkey (2680) (med. fat)
Horse Meat (1610)
Horse Offals (315)
Milk (cow) (660)
Milk (goat) (920)
Vegetables (265)
Fruits (330)
Fish (1825)
Sugars (1521)
Oils (8822)
Wheat Flour (3640-H)
Dry Milk (NFDM) (3593)

Appendix 2.2

Summary of Haitian Nutrition Studies/Caloric & Protein Levels
1951 - 1984

| Study Average Date | Authors | Dietary Intake Average KCalories | gProtein |
|---|---|---|---|
| 1951[a] | Institut Haitien de Statistiques | 1491-2450 | 70.0-82.0 |
| 1954[a] | Boulos | 2096 | 45.4 |
| 1955[a] | Cesar | 2236 | --.- |
| 1956[b] | Grant and Groom | 1383 | 40.0 |
| 1958[c] | Sebrell et. al. | 1580 | 37.0 |
| average[d] | | | |
| 1951-59 | Barkhuus and Daly | 1728 | 39.2 |
| 1962[f] | Beghin et. al. | 1105 | 27.0 |
| 1964[e] | Dominique et. al. | 1580 | 40.0 |
| 1964[f] | Dominique et. al. | 1552 | 42.0 |
| 1965[f] | Dominique et. al. | 1524 | 36.0 |
| 1964[f] | Dominique et. al. | 1420 | 41.0 |
| 1965[f] | Dominique et. al. | 2203 | 56.0 |
| 1965[f] | King et. al. | 1857 | 48.0 |
| 1970[g] | Beghin, Fougere and King | 1700 | 41.0 |
| 1975[h] | Beckles | 1850 | 40.0 |
| 1976[i] | World Bank | 1900 | 41.0 |
| 1980[j] | DIFPAN | 2073 | 41.0 |
| 1984[j] | UPAN (6 localities) | 12[illegible] | 32.0 |

[a] [b] King, J.M., 1978
[c] Grant and Groom, 1958
[d] Sebrell et. al., 1959
[e] Barkhuus and Daly, 1976
Saline neighborhood

[f] These surveys used the same research design
[g] Beghin, Fougere and King, 1970
[h] Beckles, 1975
[i] World Bank, 1976
[j] UPAN, 1982, 1984

Appendix 2.3

Nutritive Values of PL 480 Title II Commodities
(Per 100 gms finished dry commodity)

| FOOD GROUP/COMMODITY | Calories | g | g | g | g | g |
|---|---|---|---|---|---|---|
| **Blended Foods (Special Food Supplements)** | | | | | | |
| Wheat Soy Blend | 360 | 20.0 | 6.0 | 2.4 | 4.8 | 60 |
| Corn Soy Milk | 380 | 20.0 | 6.0 | 1.2 | 4.0 | 60 |
| Instant Corn Soy Milk | 380 | 20.0 | 6.0 | 1.2 | 4.0 | 60 |
| Whey Soy Drink Mix | 435 | 20.4 | 20.2 | 1.5 | 6.5 | 31 |
| **Protein-Fortified Processed Foods** | | | | | | |
| Soy-Fortified Bulgur | 350 | 17.3 | 2.0 | 2.1 | 2.4 | 70 |
| Soy-Fortified Flour 12% | 357 | 16.0 | 1.3 | .6 | 1.8 | 72 |
| Soy-Fortified Cornmeal | 392 | 13.0 | 1.5 | 1.7 | 1.7 | 86 |
| Soy-Fortified Sorghum Grits | 360 | 16.0 | 1.0 | 1.0 | 1.0 | 68 |
| Soy-Fortified Rolled Oats | 375 | 21.0 | 6.0 | 0.0 | 0.0 | 60 |
| **Processed Foods** | | | | | | |
| Bulgur | 354 | 11.2 | 1.5 | 1.7 | 1.6 | 76 |
| All-Purpose Flour | 364 | 10.5 | 1.0 | .3 | .43 | 76 |
| Soybean Salad Oil | 884 | 0.0 | 100.0 | 0.0 | 0.0 | 0 |
| **Whole Grains** | | | | | | |
| Wheat | 330 | 12.3 | 1.8 | 2.3 | 1.7 | 72 |
| Corn | 348 | 8.9 | 3.9 | 2.0 | 1.2 | 72 |
| Sorghum | 332 | 11.0 | 3.3 | 1.7 | 1.7 | 73 |

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