



EVALUATION OF THE MARKET SYSTEM AND POTENTIAL  
FOR AGRICULTURAL PRODUCTS IN PARAGUAY

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## REPORT SUMMARY

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## SUMMARY STATEMENT

The objectives of this study are to assess the future marketing potential of agricultural products, current market channels, and margins and prices in relation to domestic and export markets within Paraguay.

The current and future situation was assessed with regard to (1) projected production potentials, (2) projected market volumes and distribution patterns, (3) current market structure, and (4) constraints unique to the agricultural market of Paraguay.

While Paraguay has an abundance of land available for crop productions and rapid studies have been made in increasing hectarage under crop production, the need for market development imposes a constraint upon increasing production in the future. Available domestic and export markets are restricted due to features unique to Paraguay.

Improvement in the market system can not be accomplished by one best solution to the overall problem. Attention must be given to altering the market system by concentrating on the effectiveness of the system. Development of system-wide commodity directed plans with preliminary in-depth planning will be required to solve current problems.

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**PART ONE**

**OVERALL PERSPECTIVE**



## SECTION

### INTRODUCTION

This study represents an integral segment of overall analysis of the small farmer agricultural subsector as presented in the "Small Farmer Subsector Assessment" undertaken by the AID mission in Paraguay. The services of the Food and Feed Grain Institute were supplied through the Technical Assistance Bureau of AID/Washington under the worldwide contract with Kansas State University at the request of Dr. David Peacock, Rural Development Officer for AID in Paraguay.

#### Purpose of Study

The general objective of this study was to identify and analyze future marketing potentials for agricultural products.

Specific goals include the following:

1. Develop projections of agricultural production potentials by department through 1985.
2. Develop projections of market volumes and distribution patterns.
3. Assessment of marketing channels, margins and prices in relation to domestic and export markets.

#### Current Marketing Conditions

The current agricultural commodity marketing environment in Paraguay is characterized by the following:

##### Limited Domestic Market:

1. The domestic market for agricultural products is limited due to the level and distribution of the population. The total population of the country in 1972 was 2,357,955 persons. The observed annual growth rate from 1962 to 1972 was 2.69 percent.

The average population density in Paraguay is only 5.8 inhabitants per square kilometer, one of the lowest in South America. Naturally, the lowest density is in the Chaco, with a density of only 0.3 inhabitants per square kilometer. In the crop production area (Eastern Paraguay) the three departments (Cordillera, Guaira, and Paraguari) with the highest density range from 24 to 42 inhabitants per square kilometer. All other departments in Eastern Paraguay have less than 12.2 inhabitants per square kilometer.

Paraguay has only one large urban area, Ascunsion. There are only six other towns with population over 10,000. Census data indicate relative stability between the urban and rural components of the population.<sup>1</sup>

Distance to Export Markets:

2. While Paraguay exports a wide array of raw and processed agricultural products, it is continually confronted with its geographic location in relation to exportation of goods. As a land-locked country, goods must travel either by river or overland substantial distances to reach ports in Argentina or Brazil for export to Europe, North America, or Africa. This distance, as well as transshipment costs, places heavy cost burdens upon products destined for foreign markets. In the case of many commodities, exportation depends on external prices (world prices). This places Paraguay at a competitive disadvantage to other countries producing and exporting the same commodities. As a result Paraguayan farmers often have lower real incomes from commodities produced for export than is true for producers of other countries. This locational impact also extends to the costs of importing advanced technological farm inputs.

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<sup>1</sup>The description of urban, for census purposes, comprises the principal towns of departments as well as certain other selected towns and municipalities.

Undeveloped Physical Infrastructure:

3. Physical infrastructure for the movement of goods is limited primarily to the road network system. While the country has over 4,000 miles of roadways, less than 15 percent of this system is in all-weather roads. The transport alternatives of water and rail are quite restricted -- water transport because of the navigational limitation of rivers, and rail transport because of the physical limitation of railways and rolling stock.

Present estimates indicate that there are approximately 8.8 million hectares of land suitable for crop production; currently only 958,000 hectares are being used. Land area, therefore, is not a constraint on agricultural production at this time.

While the strategy of increasing agricultural production is required for future economic growth of Paraguay, the constraints in the markets and marketing system for Paraguay's agricultural products preclude substantial production increases. These conditions emphasize the importance of a rational approach to market planning and development as a foundation for agricultural development in Paraguay.



## SECTION II

### SUMMARY OF FINDINGS AND RECOMMENDATIONS

This section presents a summary evaluation of the current marketing system, projected market potentials, and recommendations for improvement of the marketing system. This summary must be viewed within the need for a balanced development of the agricultural sector. While Paraguay produces a wide variety of crop and livestock products, the nation's agriculture is heavily dependent on crop production for food and for cash earnings from export sales. The vast majority of small farmers in all departments produce corn. A large percentage of these same farmers also cultivate cotton and tobacco.

Crop agriculture is also dominant in the country's associated agricultural industry. Marketing, processing, and distribution of crop products comprise large portions of Paraguay's commercial and industrial sectors. The large fraction of human and agricultural inputs devoted to crop production indicate the relative importance of crops in the total demand for machinery, tools, fertilizers, pesticides, agricultural credit, and transport facilities.

Paraguay has an abundance of land available for crop production except in the over-populated departments close to Asuncion. Rapid strides have been made during the past 15 years in increasing the hectarage under crop production, but now the need exists for further development of markets so that this increased production can continue. The need of development of markets for agricultural products of the magnitude called for in the next 10 years will not come automatically. Careful plans must be made for balanced development and timing in both production and marketing. Government policies and programs must be carefully coordinated. Resource requirements must be identified in specific terms, and plans must be laid to insure that these resources will be

brought to bear effectively. Finally, the program for development of crop production and marketing must be integrated with other agricultural development programs to insure balanced and integrated development of the total agricultural sector of Paraguay's economy.

#### Current Market System

The current market system can best be described by the marketing channels that exist. Four basic patterns exist. They are (1) the first-stage handlers (acopiadores) system, moving commodities from the farm level to further distribution and processing stages, (2) the movement of commodities directly from farm to local markets, (3) the movement of commodities from large farms to processors and/or exporters, and (4) the movement of commodities in a vertically integrated system.

Small farmers must use the first two channels. Through the development of an effective system of farmer cooperatives, small farmers can develop the kinds of channels represented by (3) and (4), but this adjustment to the system is slow, due not to the inability of cooperatives to function together, but to economic constraints within the total system. Indicated marketing margins, as described in Section V, are extremely small and yield low returns on investments. There are no excess profits available for the cooperative system to return to members. Unless excellent management and planning is applied, cooperative growth will continue to be limited.

The same applies to the export sector, also described in Section V. Actual average prices received by Paraguay farmers for export crops closely parallel what can be paid for products at the farm level when export prices are "backed to the producer". This explains why crops such as soybeans, cotton, and tobacco have become basic export crops and why corn (with relatively higher domestic prices) has failed to become an export crop of any significance.

While these results may seem to indicate that the market system has not performed, an analysis of farmer's share of market price (Section V) indicates that the system has performed quite well during the past 6 years. In no case has the farmer's share of the final market price been below 50 percent. The farmer's share of the final market price for most products has increased substantially with rising world prices. Volatility can be noted due to lags caused by recent upheavals in world prices and local conditions in fruit and vegetable marketing. When compared to highly industrialized agriculture in developed countries, the farmers' shares indicate that the efficiency of the current marketing system is relatively high.

The constraints on the current system are constraints of distance and infrastructure. Storage at the current time seems to impose no serious constraint. Losses within the system cannot be accurately calculated, but based upon reported moisture levels at harvest plus sporadic movement problems, these losses seem to be within reason. Most of the losses arise from shrinkage or spoilage due to high moisture content with shrinkage undoubtedly being the largest source of loss. The tabulated reports of the acopiodore survey indicate that this is a specific area problem rather than a country-wide problem.

These constraints and system problems are further evidenced by the flow of products. The net market flows for soybeans, corn, cotton, tobacco, rice, and wheat shown in Figures 1 through 6 illustrate concentration of production, the distances required to move products to market outlets, and the general flow of product from production area to market area.

FIGURE 1-i

CALCULATED NET FLOWS  
Soybeans



FIGURE 1-2

CALCULATED NET FLOWS  
Corn



FIGURE 1-3

CALCULATED NET FLOWS  
Cotton

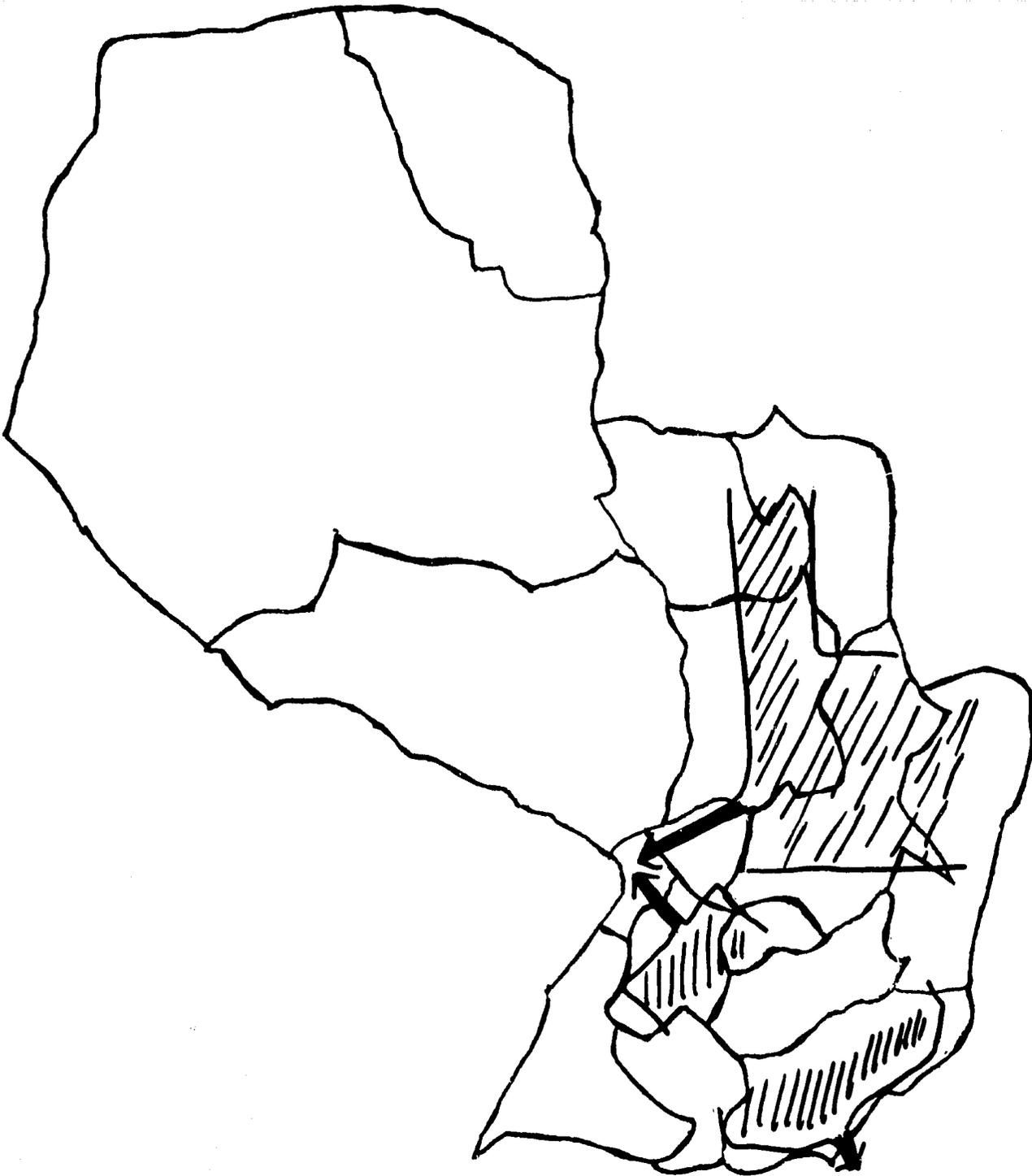


FIGURE 1-4

CALCULATED NET FLOWS  
Tobacco



FIGURE 1-5  
CALCULATED NET FLOWS  
Rice

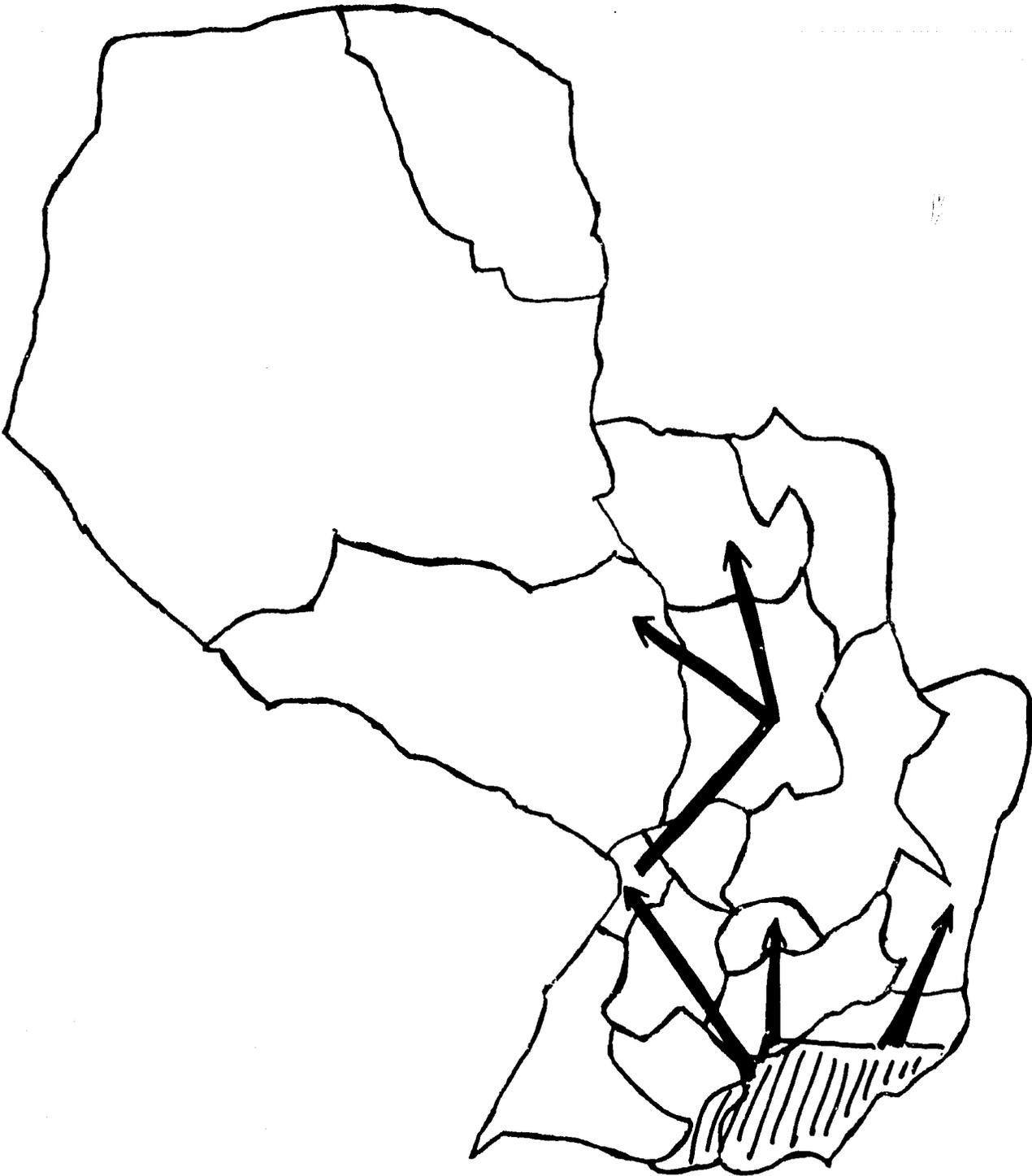
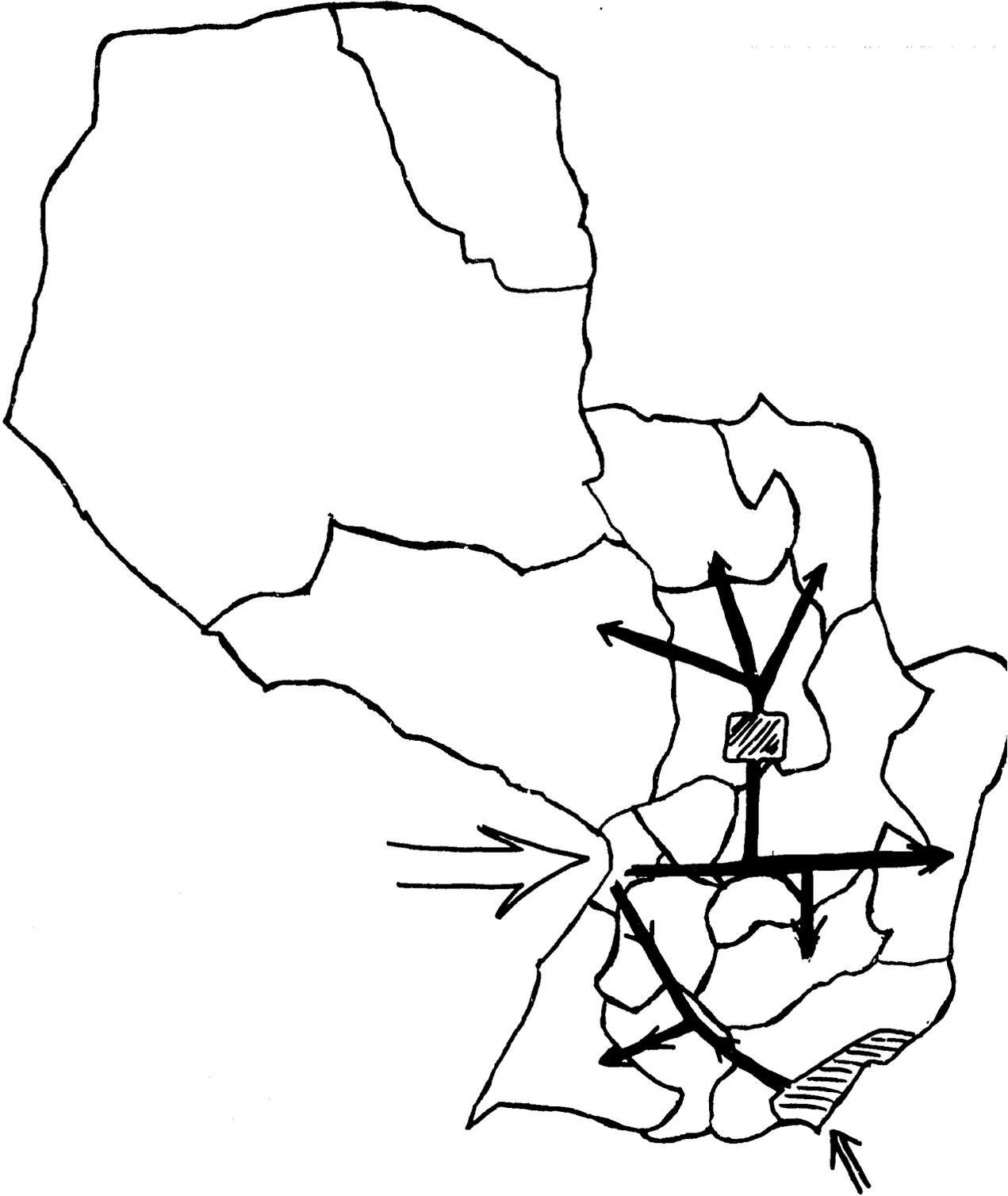


FIGURE 1-6

CALCULATED NET FLOWS  
Wheat



### Available Markets

The available domestic and export markets are constrained by unique features inherent to Paraguay. The domestic market is limited by Paraguay's small population relative to her land area and ability to produce agricultural products. Export markets are limited by Paraguay's geographical location causing high costs of transport to available foreign markets.

Production and utilization patterns have been analyzed in Sections III and IV. Rapid growth in production of crops has occurred in the past 10 years with a corresponding increase in exports of specific crops destined for foreign markets. The only major crop that does not reach self-sufficiency levels is wheat.

With the exception of corn, cotton, and edible beans, the location of crop production is highly concentrated as shown in Section III. Movement of crops as evidenced from flow diagrams, Figures 1 through 3, must be made to either the concentrated market area of Asuncion or to export outlets of Asuncion or Encarnation. The Port Stroesner area is becoming an increasingly important market, but, while it may become the second largest market area in terms of population, it will fall far short of the market demand created by metropolitan Asuncion.

Another problem in the marketing of products destined for export is the problem of "unofficial" or "unregistered" exports across Paraguay's borders to Brazil and Argentina. The "unofficial" exports create markets for the produce of Paraguay's farmers when domestic prices fall below those in the neighboring countries, but such markets are reached much more effectively by large and influential farmers than by small farmers. Of course, the "unofficial" exports (and imports) create many problems in trying to reconcile production and market statistics for purposes of marketing analysis and projection of market potentials.

Exports of agricultural products have grown significantly over the past 10 years. The share of world markets held by Paraguay has increased for cotton, soybeans, and tobacco.

A balance sheet approach was used to calculate supply and utilization patterns for the major commodities. The patterns indicate no large carryover balances to cause market price disruptions but that available markets place serious constraints on the growth of agricultural production.

### Market Potentials

Market potentials for the major commodities were calculated by projecting total demand through 1985. Domestic demand projections were constructed from projections of population and per capita consumption of food product groups (see Sections VI & VII). Export market potentials are based on projections of world trade and Paraguay's share of the world market as per Section VIII.

The results of these projections indicate the following:

1. The domestic market will remain limited, even with projected population growth and an increase in per capita consumption of food.
2. Export markets are limited by the rate increase in total world trade and by the market share that Paraguay holds. The projections indicate that total world trade in selected commodities will continue to increase, but that concentrated effort is required if Paraguay is to continue to increase its share of total world markets.

In the future, Paraguay's export market potentials might be reduced by a reduction of world trade. If Paraguay's shares of total world trade remain constant, a decline in world trade of 500,000 metric tons would cause a decline in Paraguay's export market of approximately 5,000 metric tons in the case of soybeans and 3,500 metric tons in the case of cotton, for example. The results would be even more critical if Paraguay were to incur a loss of market share through the actions of competitive countries through larger world production or through lower world prices and margins for soybeans, for cotton, or for tobacco. A loss of 1 percent of the market share currently held would reduce the export market potential by approximately 18,000 metric tons for soybeans, 4400 metric tons for cotton and more than 1,000 metric tons for tobacco.

3. If present long-term trends continue, Paraguay will have increasing difficulty finding adequate world markets for her exports of soybeans, cotton, and tobacco (Section IX). Production of these crops has been increasing at faster rates than export potentials. Increased effort toward developing new export markets will have to be made if these divergent trends are to be maintained.

#### Improving the Marketing System

There appears to be no one best solution or series of alternative actions for correcting marketing problems within the context of the present marketing system for grains, cotton, and tobacco. The efficiency of the current system cannot be significantly improved given the small marketing margins and high costs of exporting these products.

The farmer's share of final market prices is quite satisfactory given the distances products must be moved to markets and loss factors inherent in the system. Sweeping marketing system changes will be required in order

to support substantial improvements in total farm income of the small farmer and the agricultural marketing and processing industries.

The marketing system must be altered by concentrating on the effectiveness of the system. Effectiveness may be thought of as "doing the right thing" whereas efficiency is "doing the thing right". The primary goal needs to be the development of markets for quality products and building a production-marketing delivery system which can supply these markets effectively. This development of the marketing effort should be an integrated development encompassing all agricultural sectors for the specific commodities involved. A systems approach to management of market development needs to be instituted.

Separate system-wide plans need to be developed for (1) the durable crops (grains, cotton, tobacco); (2) the perishable crops (vegetables, fruits, and tubers); (3) the speciality crops (essence products, etc.); and (4) livestock and livestock products. This is a long range program requiring concentrated effort by government and private industry and support by donor agencies.

Preliminary to in-depth planning, a general market development plan needs to be constructed and implemented. This initial development plan should contain at least four components, including (1) training and human resource development, (2) development of an integrated agricultural production and marketing plan, (3) market extension and information, (4) and marketing opportunities development.

The first thrust of this approach probably should be the training component encompassing such functions as export trading, transporting, forecasting, feasibility studies, extension, data collection, etc. Once this component has been established, then the development of a plan of action should begin.

The integrated agricultural production and marketing development plan must be comprehensive to include a broad array of necessary items, such as follows:

1. Improved Data Base

- A. Domestic human consumption of foods
- B. Domestic animal consumption of grains
- C. Domestic industrialization of agricultural products
- D. Export data by flows with sampling procedures to estimate "unregistered" exports
- E. Marketing patterns, margins and costs
- F. Production cost analyses

2. System-Wide Analysis

In-depth analytical studies by commodity to determine factors that operate within the production-marketing for the commodity.

3. Strategy Development

- A. Focus upon effectiveness as well as efficiency
- B. Establishment of priorities by commodity and by production area
- C. Concentration of marketing assistance via commodity systems based on comparative advantages in Paraguay

4. Establishment of targets, such as sales volumes, jobs, land use, income levels etc.

5. Plans for implementation, including imports required, organization, and other details

It is probable that the most successful development plans will be in the form of general assistance programs by government to agricultural and agribusiness, private enterprise, including cooperatives, to aid in development of markets, assistance in transport, assistance in markets contracts, development processes of the agro-industrial complex, proper financial support as determined by feasibility studies, etc.

Concurrently with this approach, specific problem areas can be addressed. Individual pilot projects concerning losses and loss prevention can be initiated to develop information and successful prototypes. Appropriate modern technology can be introduced in production, handling, processing, storage, transport, and distribution functions. Priority improvements in

infrastructure identified as the plans can be implemented to enhance the accessibility of production areas to market outlets, whether the market outlets be domestic or export. Alternative food policies can be appraised and the most effective sets of policies to support the development selected for implementation. Such developments will make the existing production-delivery systems more effective and at the same time pave the way for modernization of the total agricultural marketing system in Paraguay.

PART TWO

SUMMARY OF EXISTING PATTERNS

### SECTION III

#### EXISTING PRODUCTION PATTERNS

The composition of agricultural production in Paraguay includes a broad array of crops. Table 1 shows the ranking of 27 separate crops with gross values greater than U.S. \$1,000,000 in 1974. The five leading crops ... cassava, soybeans, corn, cotton and sugar cane represent some 60 percent of Paraguay's total crop income, and the top ten, including sweet potatoes, tobacco, bananas, edible beans and native oranges represent three-fourths of the country's income from crop agriculture.

Cassava, sweet potatoes, pumpkins, and squash are produced primarily as subsistence crops for home consumption. Corn, sugar cane, bananas, edible beans, native oranges, watermelon, pineapple, and cantelope also are important subsistence crops, but available surpluses are sold as cash crops as well. The remaining crops are grown primarily for commercial sale as cash crops. Major export crops include soybeans, cotton, sugar cane, tobacco, coffee, tungnuts, castor beans, mate, and sour orange leaves.

Many of the different crops shown in Table 1 are produced on the same farms, especially those operated by small farmers. Part of the reason for this is utilization of labor for peak planting and harvesting requirements, as illustrated by the principal harvest dates shown in Figure 2. This, coupled with highly variable commodity prices from year to year and no clear comparative advantages for specific crops in most production areas, encourages the small farmer to diversify his crop enterprises. For the same reasons, many small farmers in Paraguay also raise a few hogs and chickens as well as a wide variety of different crops.

TABLE 1  
USE AND RANK OF MAJOR CROP BY GROSS VALUES (1974)

| Crop               | Rank | Gross Value     | Principal Use       |                 |        |
|--------------------|------|-----------------|---------------------|-----------------|--------|
|                    |      | Million U.S. \$ | On Farm Consumption | Commercial Sale | Export |
| Cassava            | 1    | 63.9            | *                   |                 |        |
| Soybeans           | 2    | 29.6            |                     | *               | *      |
| Corn               | 3    | 25.2            | *                   | *               | *      |
| Cotton             | 4    | 23.6            |                     | *               | *      |
| Sugar Cane         | 5    | 15.9            | *                   | *               | *      |
| Sweet Potatoes     | 6    | 9.5             | *                   |                 |        |
| Tobacco            | 7    | 8.8             |                     | *               | *      |
| Bananas            | 8    | 8.6             | *                   | *               |        |
| Edible Beans       | 9    | 7.7             | *                   | *               |        |
| Oranges (Native)   | 10   | 7.0             | *                   | *               |        |
| Rice               | 11   | 6.4             |                     | *               |        |
| Wheat              | 12   | 6.4             |                     | *               |        |
| Coffee             | 13   | 6.3             |                     | *               | *      |
| Watermelon         | 14   | 4.6             | *                   | *               |        |
| Tungnuts           | 15   | 4.6             |                     | *               | *      |
| Coconuts           | 16   | 4.4             |                     | *               |        |
| Peanuts            | 17   | 3.7             |                     | *               |        |
| Castor Beans       | 18   | 3.7             |                     | *               | *      |
| Pumpkin, Squash    | 19   | 2.3             | *                   |                 |        |
| Onions             | 20   | 2.3             |                     | *               |        |
| Pineapple          | 21   | 2.2             | *                   | *               |        |
| Tangerines         | 22   | 2.0             |                     | *               |        |
| Melon, Cantelope   | 23   | 2.0             | *                   | *               |        |
| Yerba Mate         | 24   | 1.8             |                     | *               | *      |
| Sour Orange Leaves | 25   | 1.7             |                     | *               | *      |
| Potatoes           | 26   | 1.6             |                     | *               |        |
| Grapes             | 27   | 1.6             |                     | *               |        |

Source: Small Farmer Subsection Assessment, USAID/Paraguay

FIGURE 2

PRINCIPAL HARVEST DATES FOR CASH CROPS OF SMALL FARMERS - PARAGUAY

| MONTH \ CROP | JULY       | AUGUST     | SEPT.      | OCT.       | NOV.       | DEC.       | JAN.       | FEB.       | MARCH      | APRIL      | MAY | JUNE    |
|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----|---------|
| SOYBEANS     | FROST →    | ← HAIL →   |            |            |            |            |            |            |            |            |     | ← FROST |
| WHEAT        |            |            |            | XXXXXXXXXX | XXXXXXXXXX |            |            |            |            |            |     |         |
| CORN         |            |            |            |            |            | XXXXXXXXXX | XXXXXXXXXX |            |            |            |     |         |
| COTTON       |            |            |            |            |            |            |            | XXXXXXXXXX | XXXXXXXXXX | XXXXXXXXXX |     |         |
| RICE         |            |            |            |            |            |            |            |            | XXXXXXXXXX | XXXXXXXXXX |     |         |
| BEANS        |            |            |            |            |            | XXXXXXXXXX | XXXXXXXXXX | XXXXXXXXXX | XXXXXXXXXX | XXXXXXXXXX |     |         |
| PEANUTS      |            |            |            |            |            | XXXXXXXXXX | XXXXXXXXXX |            | XXXXXXXXXX |            |     |         |
| SORGHUM      |            |            |            |            |            |            | XXXXXXXXXX | XXXXXXXXXX | XXXXXXXXXX |            |     |         |
| SUGAR CANE   | XXXXXXXXXX | XXXXXXXXXX | XXXXXXXXXX |            |            |            |            |            |            |            |     |         |
| TOBACCO      |            |            |            |            |            | XXXXXXXXXX | XXXXXXXXXX | XXXXXXXXXX |            |            |     |         |

The production, utilization, marketing, and price data for the fruit and vegetable crops are much more limited than for the major grain crops, cotton and tobacco. Very limited analysis for the fruit and vegetable crops could be made in this study. These products should be investigated as a separate crop group because of (1) the process of marketing perishable products versus non-perishable crops, (2) incomplete production data for this group, and (3) the majority of the crops are permanent crops that require a longer planning period.

#### Historical Production Data

Historical crop production, livestock numbers, and livestock product production are shown for Paraguay and by department as available in the tables in Computer Appendix 1<sup>1</sup> of the supporting volume of computer tabulations to this report. Table 2 summarizes the national production of selected crops. This summary indicates that while the production of all selected crops increased over this time period, there is a definite variation between crops and time segments as to the rates of increase. Over the period, soybeans have shown the most spectacular increase followed by rice, cotton and grain sorghum, particularly in recent years. Wheat production has shown a declining trend since 1971, while the other crops have increased at relatively stable rates over the period.

The only generalization that can be drawn is that recent world prices, increasing per capita income, increasing population, and government policy have all had an impact upon the rate of increase in production levels of the various crops.

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<sup>1</sup>Computer Appendix 1 is on file with AID/Washington and USAID/Paraguay.

TABLE 2  
 PRODUCTION OF SELECTED CROPS, 1962-1974  
 Metric Tons

| Year  | Soybeans | Corn    | Cotton | Sugar Cane | Tobacco | Edible Beans | Rough Rice | Wheat  | Sorghum |
|-------|----------|---------|--------|------------|---------|--------------|------------|--------|---------|
| 1962  | 2,900    | 123,400 | 32,500 | 672,000    | 16,000  | 17,600       | 16,800     | 7,200  | N/A     |
| 1963  | 7,200    | 120,100 | 40,000 | 700,000    | 25,000  | 19,000       | 16,000     | 7,000  | N/A     |
| 1964  | 10,000   | 206,000 | 35,800 | 964,100    | 12,000  | 23,700       | 20,000     | 9,170  | N/A     |
| 1965  | 18,000   | 100,000 | 42,002 | 991,700    | 18,000  | 36,301       | 21,600     | 7,040  | N/A     |
| 1966  | 20,000   | 165,400 | 28,900 | 981,500    | 8,750   | 19,320       | 10,100     | 7,200  | N/A     |
| 1967  | 18,000   | 225,000 | 26,700 | 987,940    | 13,500  | 22,540       | 18,170     | 9,160  | N/A     |
| 1968  | 13,500   | 180,000 | 30,100 | 702,000    | 22,000  | 18,000       | 20,800     | 20,000 | N/A     |
| 1969  | 22,000   | 153,000 | 40,500 | 821,300    | 24,000  | 17,460       | 27,160     | 31,376 | N/A     |
| 1970  | 52,065   | 258,703 | 39,617 | 1,415,042  | 17,723  | 34,866       | 45,218     | 47,650 | N/A     |
| 1971  | 75,132   | 229,786 | 17,485 | 1,407,377  | 18,218  | 25,605       | 38,807     | 54,811 | N/A     |
| 1972  | 97,081   | 209,284 | 52,938 | 1,044,533  | 23,496  | 32,116       | 43,743     | 17,683 | N/A     |
| 1973  | 122,637  | 246,075 | 85,241 | 1,100,764  | 26,750  | 34,186       | 41,733     | 23,000 | 4,571   |
| 1974  | 181,262  | 281,595 | 89,696 | 1,202,962  | 32,411  | 42,413       | 50,688     | 35,245 | 7,432   |
| 1975* | 217,500  | 291,400 | 99,600 | N/A        | N/A     | N/A          | 56,280     | 17,987 | N/A     |

Source: Manual Estadístico Del Paraguay, 1962-1969, Sec. De Coordinación técnica Encuesta Agropecuario Por meses tres, 1970, 1971, 1972, 1973, 1974.

\* GOP Estimates

### Geographic Distribution of Production

Geographic distribution of crop production in Paraguay is summarized in Figures 3 through 9. Figure 3 shows the names and locations of the political sub-divisions as departments of Paraguay by which the detailed production statistics are reported. This map is inserted to facilitate reading the remaining figures in the series. The departments of President Hayes, Bogueron and Olimpo represent the sparsely populated Chaco Region and the remaining departments represent the East Region. Small farms are dominant throughout Eastern Paraguay, but most concentrated in the department close to Asuncion, e.g., Central, Paraguari and Cordillera.

Soybean production is relatively concentrated in extreme southern and eastern departments, especially in Itapua, Paraguay's most southeastern department (Figure 4-1). Significant and increasing quantities are produced throughout the central section of the Eastern Region, however. Corn production is more evenly dispersed throughout the Eastern Region (Figure 4-2). In comparing the production patterns of soybeans and corn, the differences in the scales for the two charts in Figure 4 should be noted.

Cotton production is relatively concentrated in the southern and central departments of Paraguay's Eastern Region (Figure 5-1). The major tobacco production is centered farther to the north, especially in San Pedro and Gaaguazu Departments.

Paraguay's sugar cane production is relatively concentrated in the south-central section of the Eastern Region, and in the Chaco Region along the Paraguay River (Figure 6). Cane production for sugar manufacture is heavily concentrated in Guaira Department where most of the mills are located (Figure 6-1). The cane production for syrup and home use is concentrated in the bordering Departments of Paraguari, Cordillera, and Gaazapa, primarily on the small farms in these areas (Figure 6-2).

FIGURE 3

DEPARTMENTS OF PARAGUAY

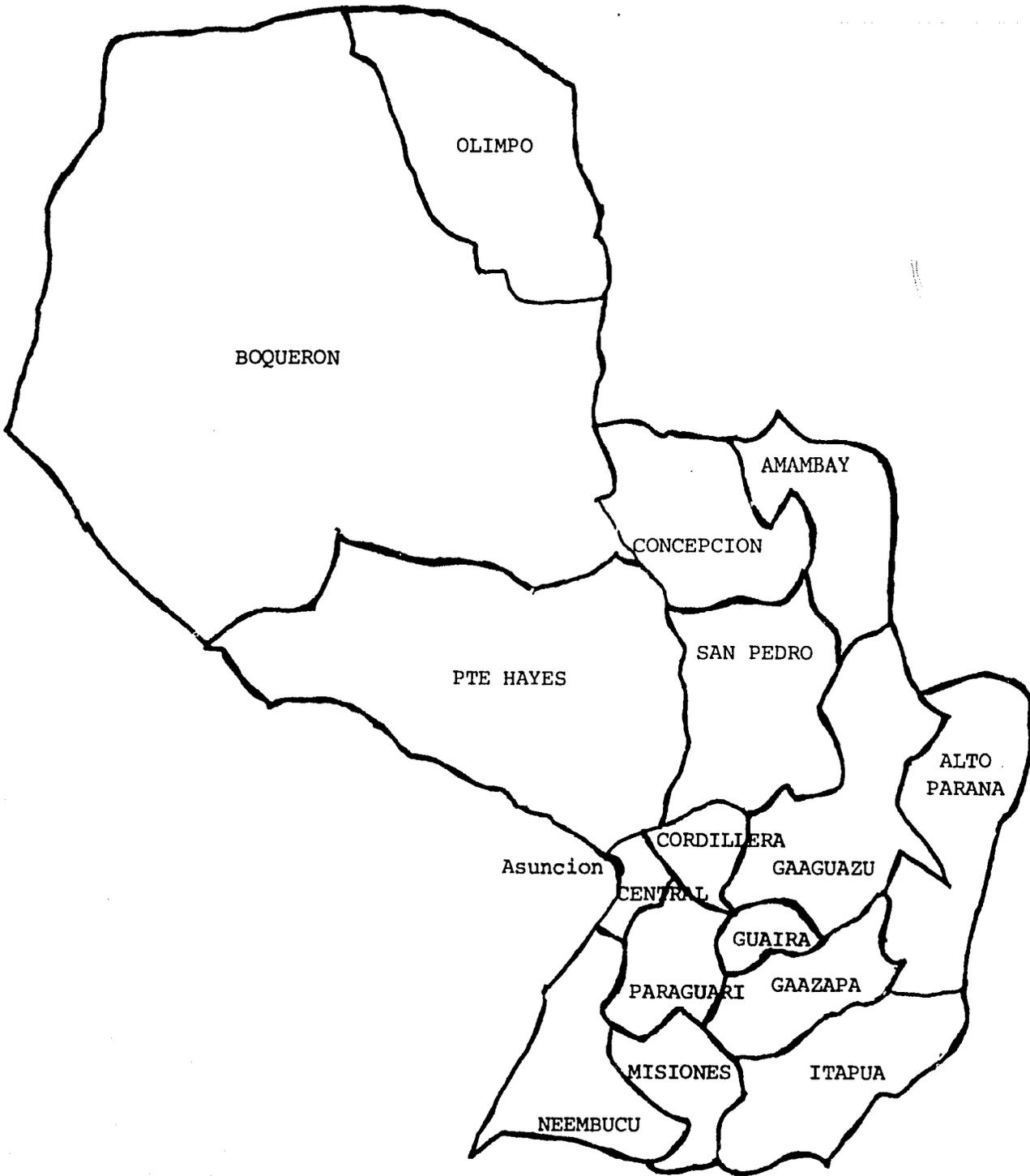


FIGURE 4-1

DISTRIBUTION OF 1974 SOYBEAN PRODUCTION BY DEPARTMENT

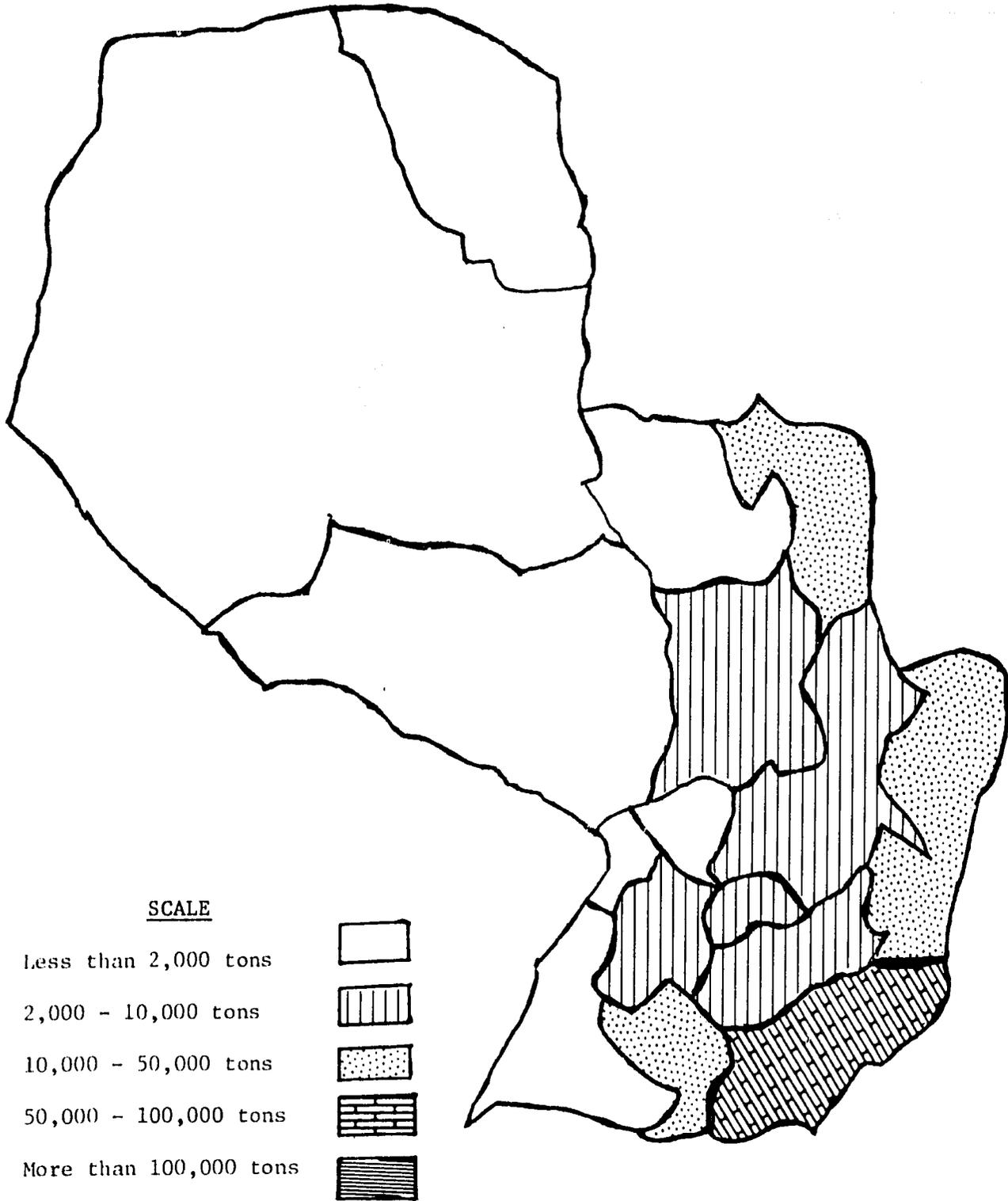


FIGURE 4-2

DISTRIBUTION OF 1974 CORN PRODUCTION BY DEPARTMENT

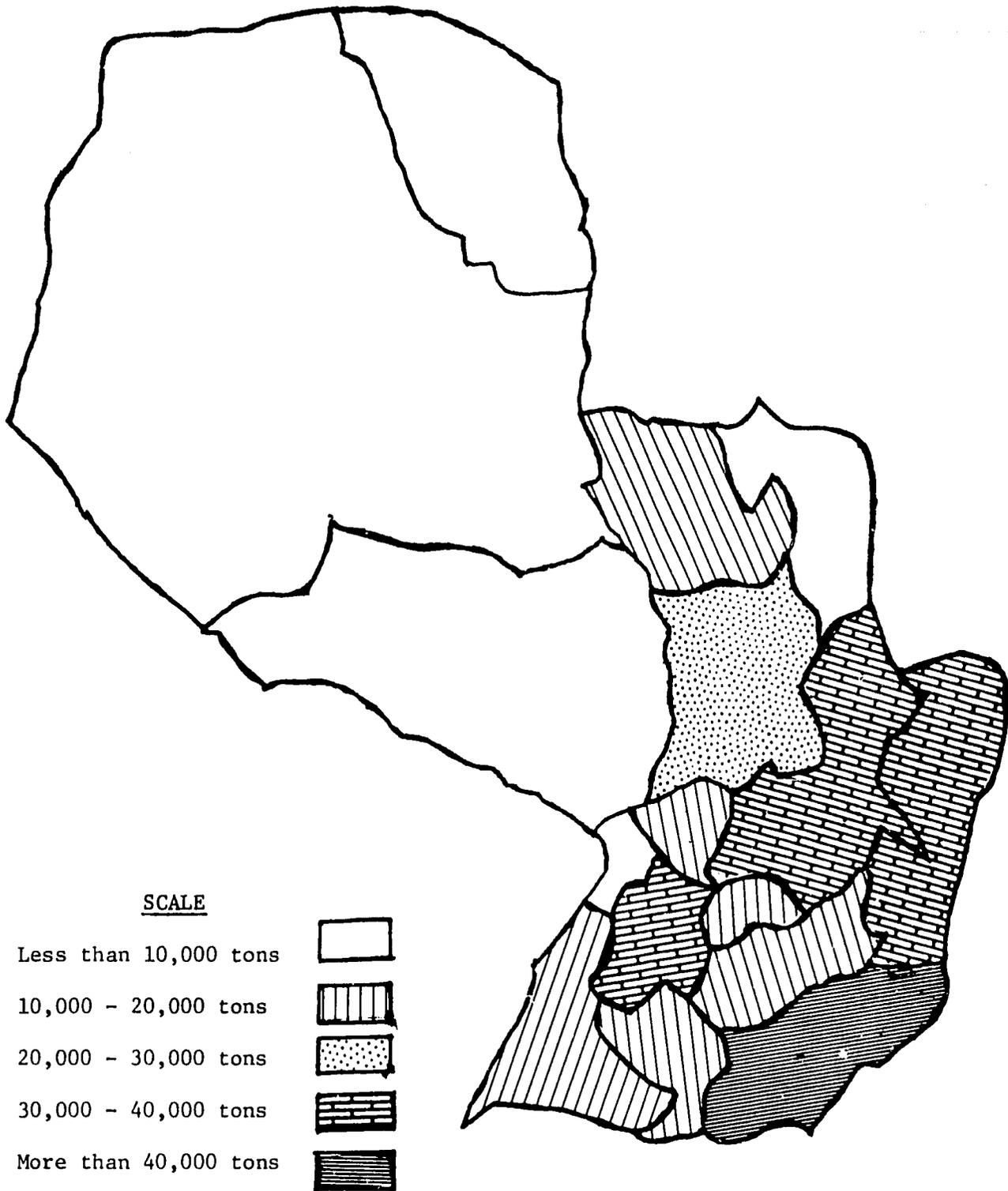


FIGURE 5-1

DISTRIBUTION OF 1974 COTTON PRODUCTION BY DEPARTMENT

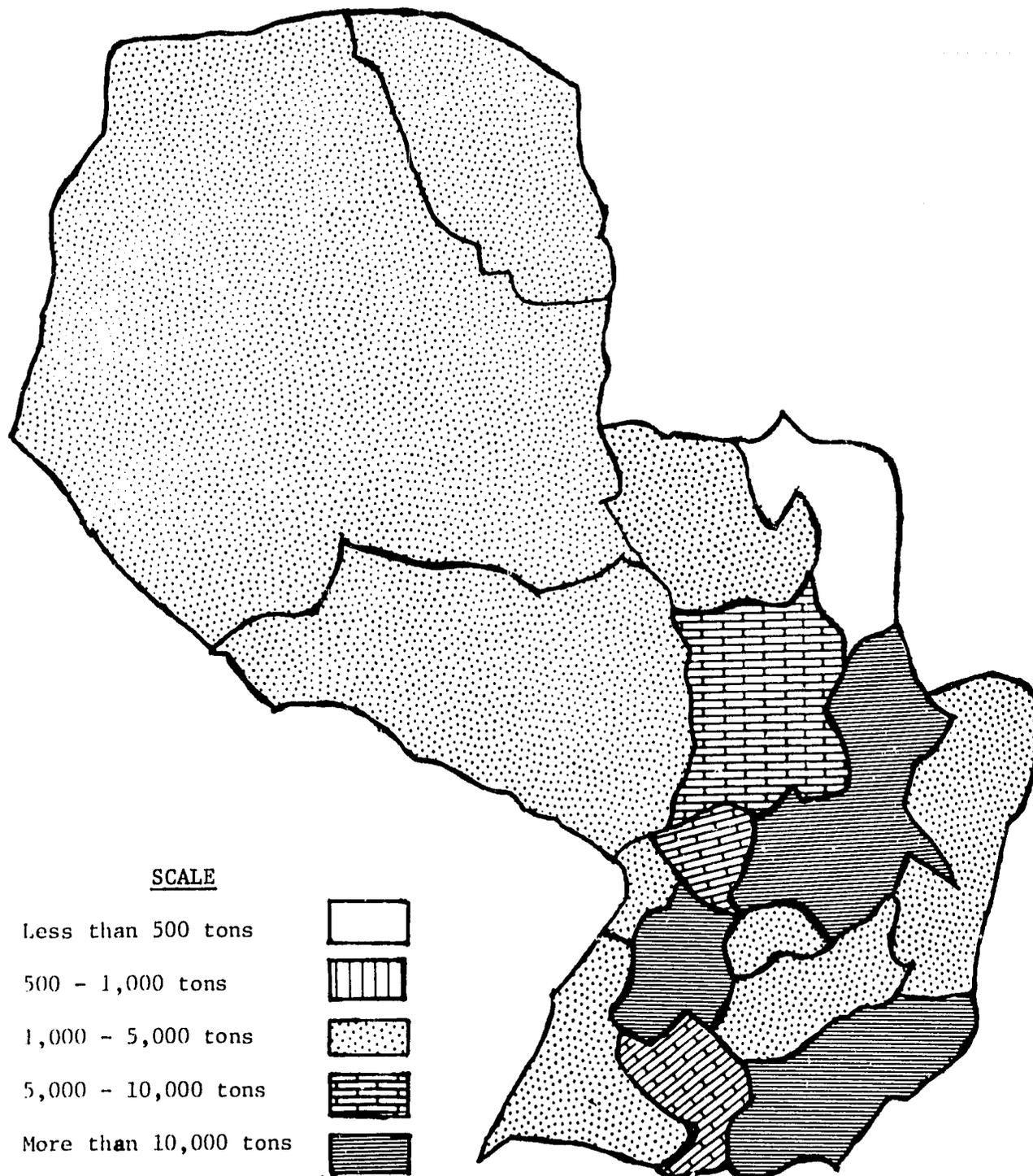


FIGURE 5-2

DISTRIBUTION OF 1974 TOBACCO PRODUCTION BY DEPARTMENT

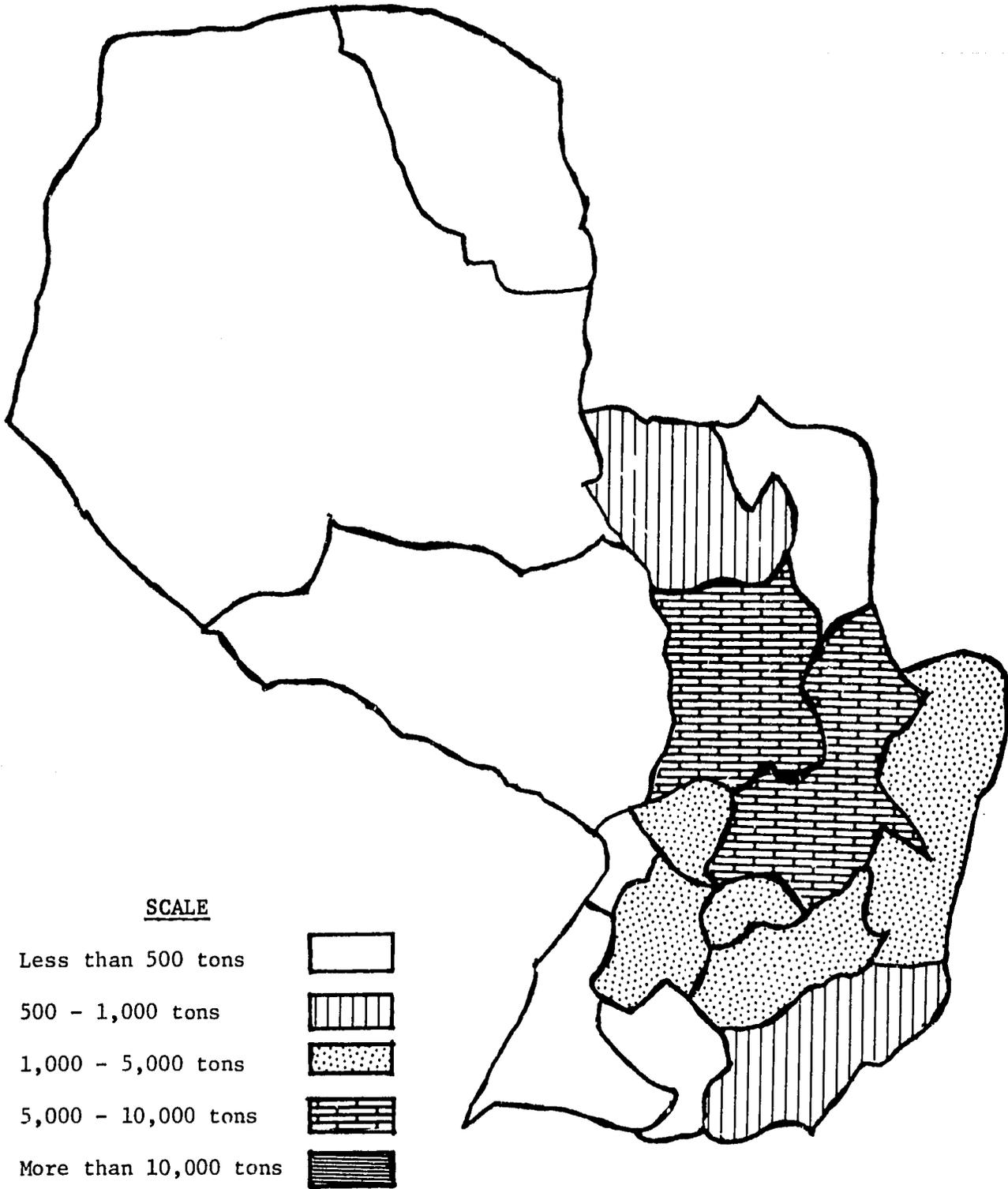


FIGURE 6-1

DISTRIBUTION OF 1974 SUGAR CANE PRODUCTION FOR SUGAR  
BY DEPARTMENT

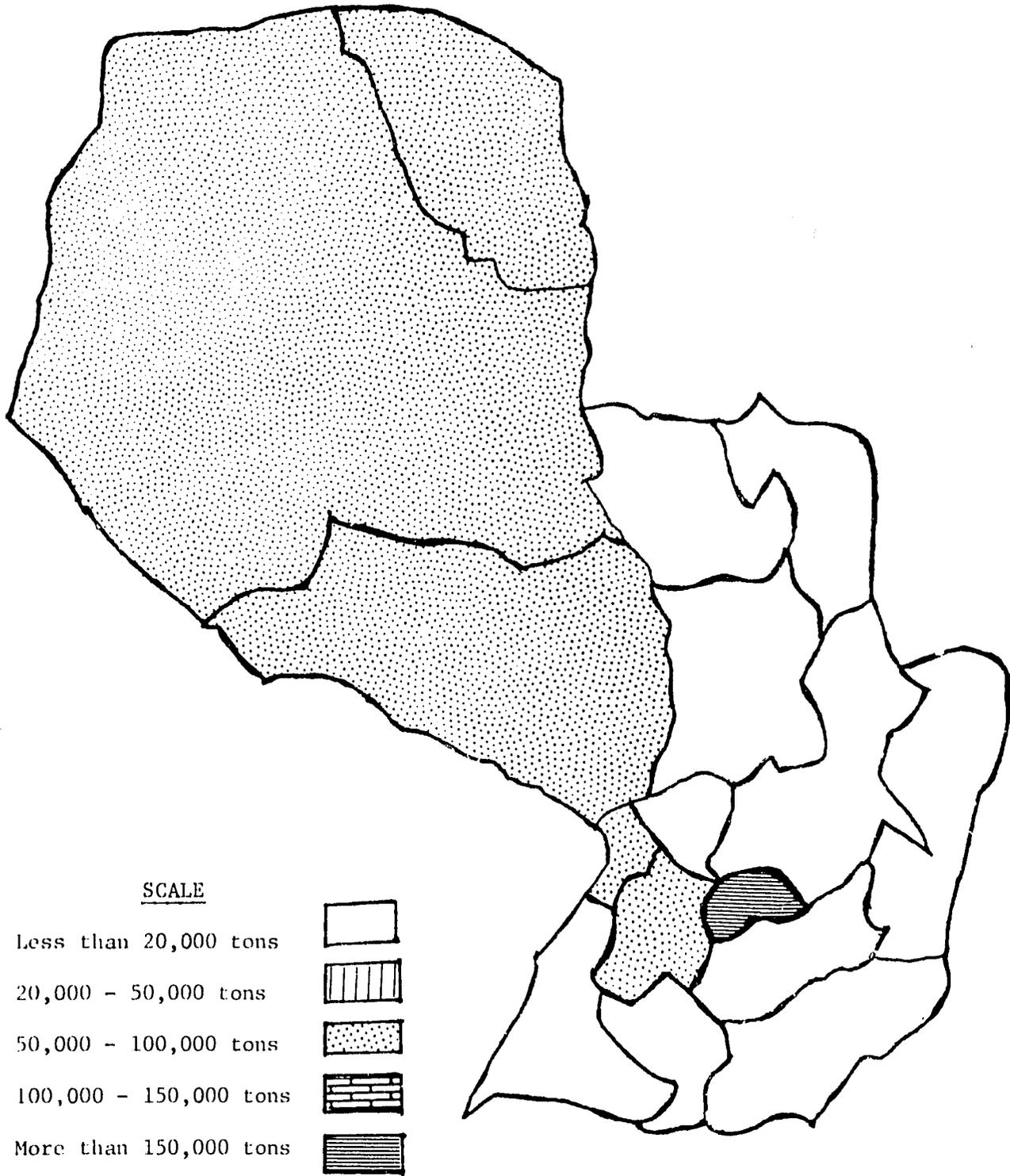
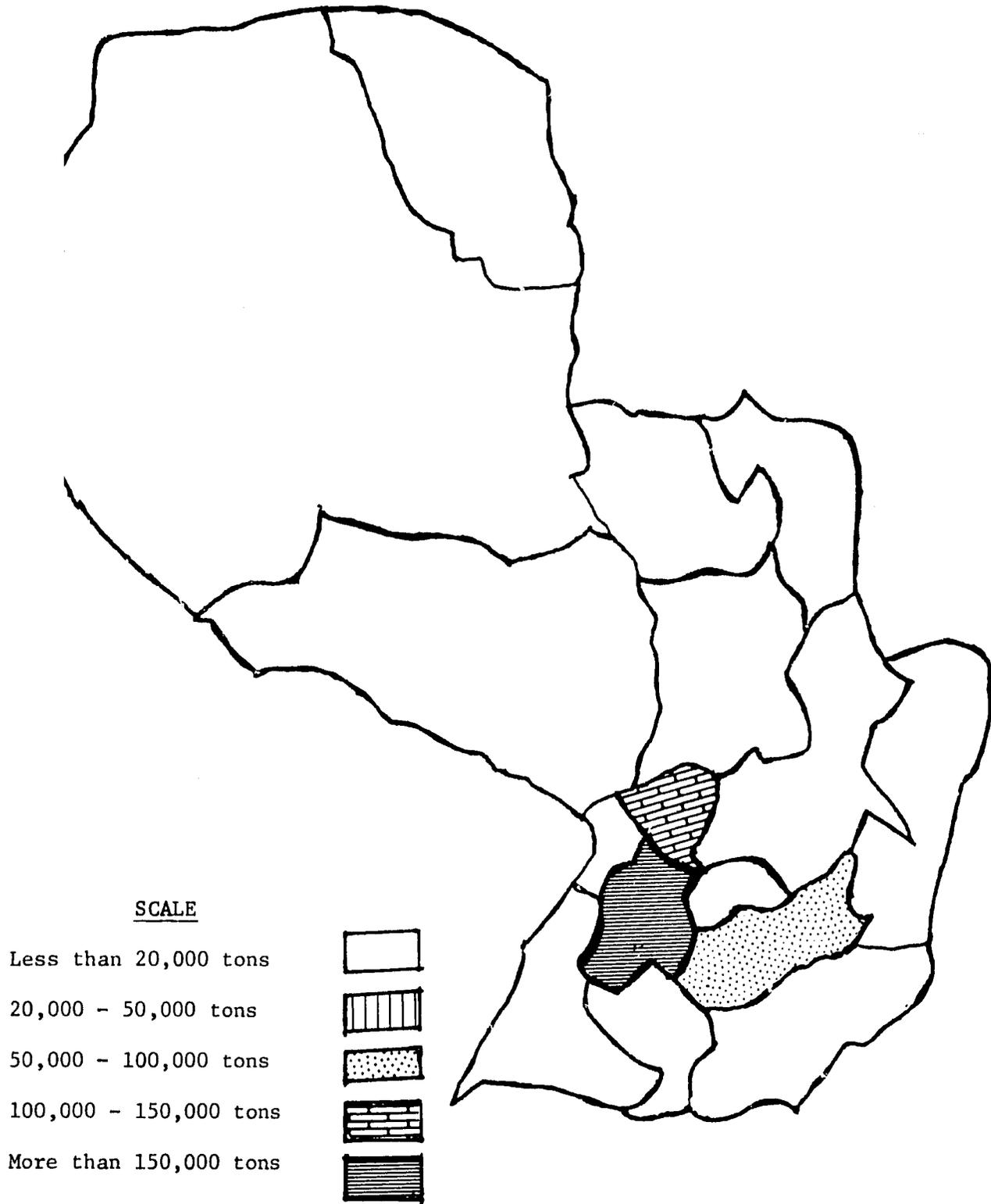


FIGURE 6-2

DISTRIBUTION OF 1974 SUGAR CANE PRODUCTION FOR SYRUP  
BY DEPARTMENT



Rice production, like that of soybeans, is relatively concentrated in the extreme southern and eastern departments. Irrigated rice is heavily concentrated in the Departments of Itapua and Misiones (Figure 7-1). Rain-fed rice production is concentrated primarily in the eastern departments along Paraguay's border with Brazil (Figure 7-2).

Edible bean production is relatively dispersed over wide areas of Paraguay, including the Chaco where much of the production is used to supply army demands (Figure 8-1). The largest edible bean production is in Paraguari, which supplies much of the Asuncion market, but the production for home consumption is spread throughout the Eastern Region. Wheat production is somewhat more concentrated in the extreme south-east, and in San Pedro Department (Figure 8-2). Grain sorghum production is developing most rapidly in areas of the Chaco Region and in San Pedro and Central Departments (Figure 8-3).

The production of the major cash crops in Paraguay is considerably more concentrated than indicated by the preceding charts based on statistics by department. The available figures for soybeans, corn, and wheat by municipality within departments indicate the relative production concentrations along roads, market or shipping points in specific areas where soil, climatic and other agronomic conditions are favorable. As shown by Figure 9, the major growing areas for soybeans, wheat, and corn in the selected departments are quite concentrated in the Encarnacion area of Itapua, along the paved national highway in Misiones, in the southern section of San Pedro which is most accessible to Asuncion by road, in the area of Amambay adjacent to the Brazilian border and in the

FIGURE 7-1

DISTRIBUTION OF 1974 IRRIGATED ROUGH RICE PRODUCTION  
BY DEPARTMENT

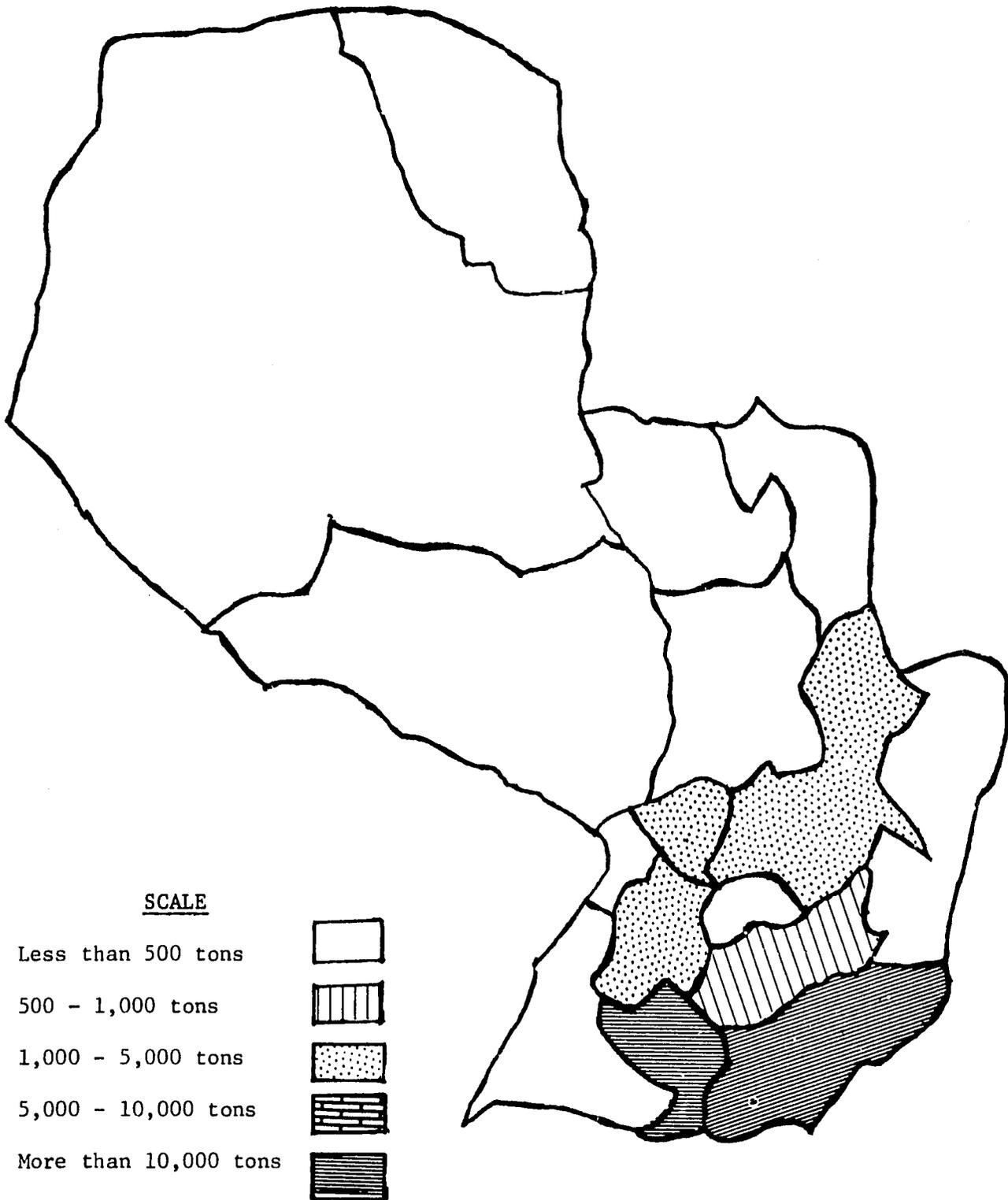


FIGURE 7-2

DISTRIBUTION OF 1974 NON-IRRIGATED ROUGH RICE PRODUCTION  
BY DEPARTMENT

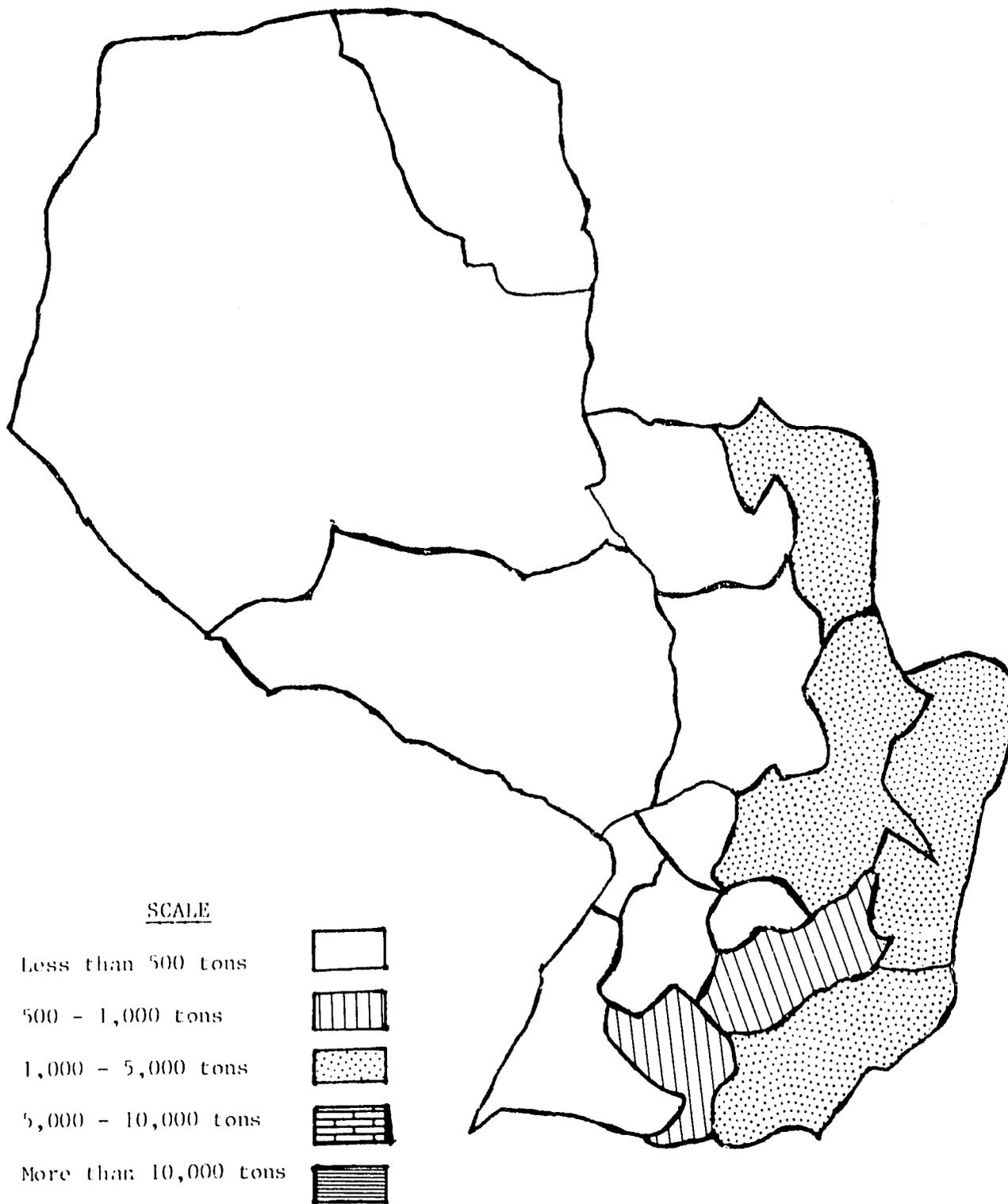


FIGURE 8-1

DISTRIBUTION OF 1974 EDIBLE BEAN PRODUCTION BY DEPARTMENT

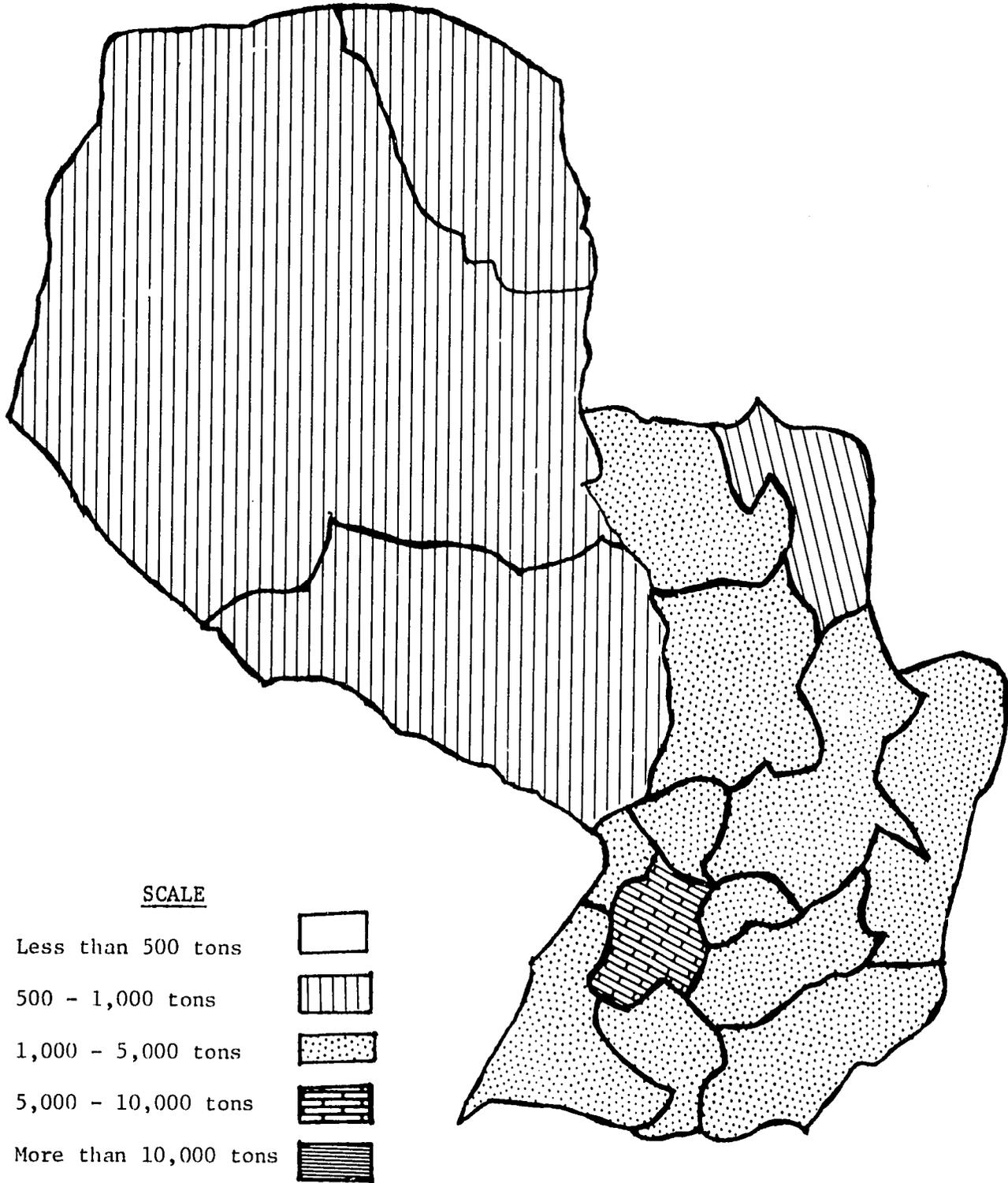


FIGURE 8-2

DISTRIBUTION OF 1974 WHEAT PRODUCTION BY DEPARTMENT

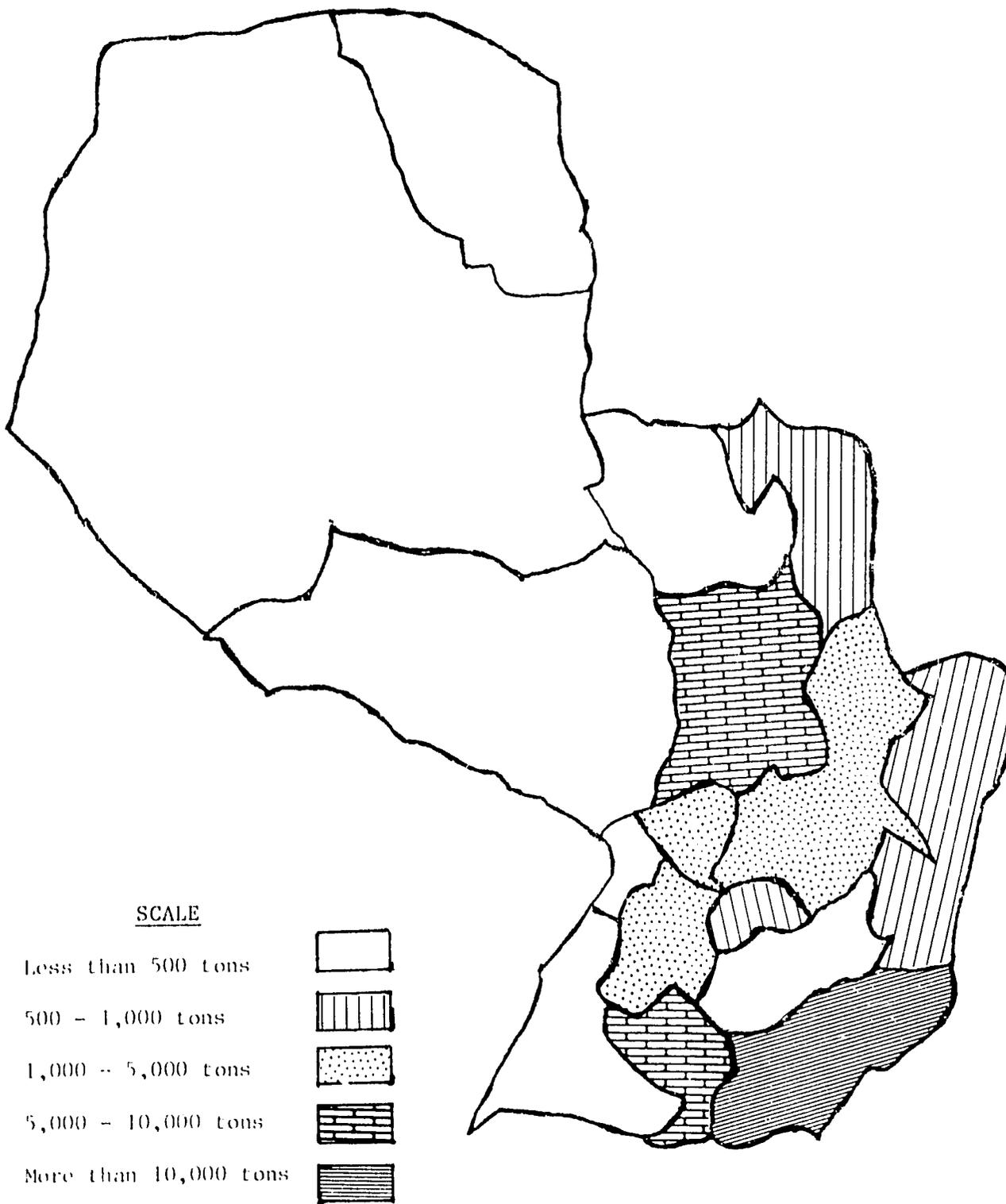


FIGURE 8-3

DISTRIBUTION OF 1974 GRAIN SORGHUM PRODUCTION BY DEPARTMENT

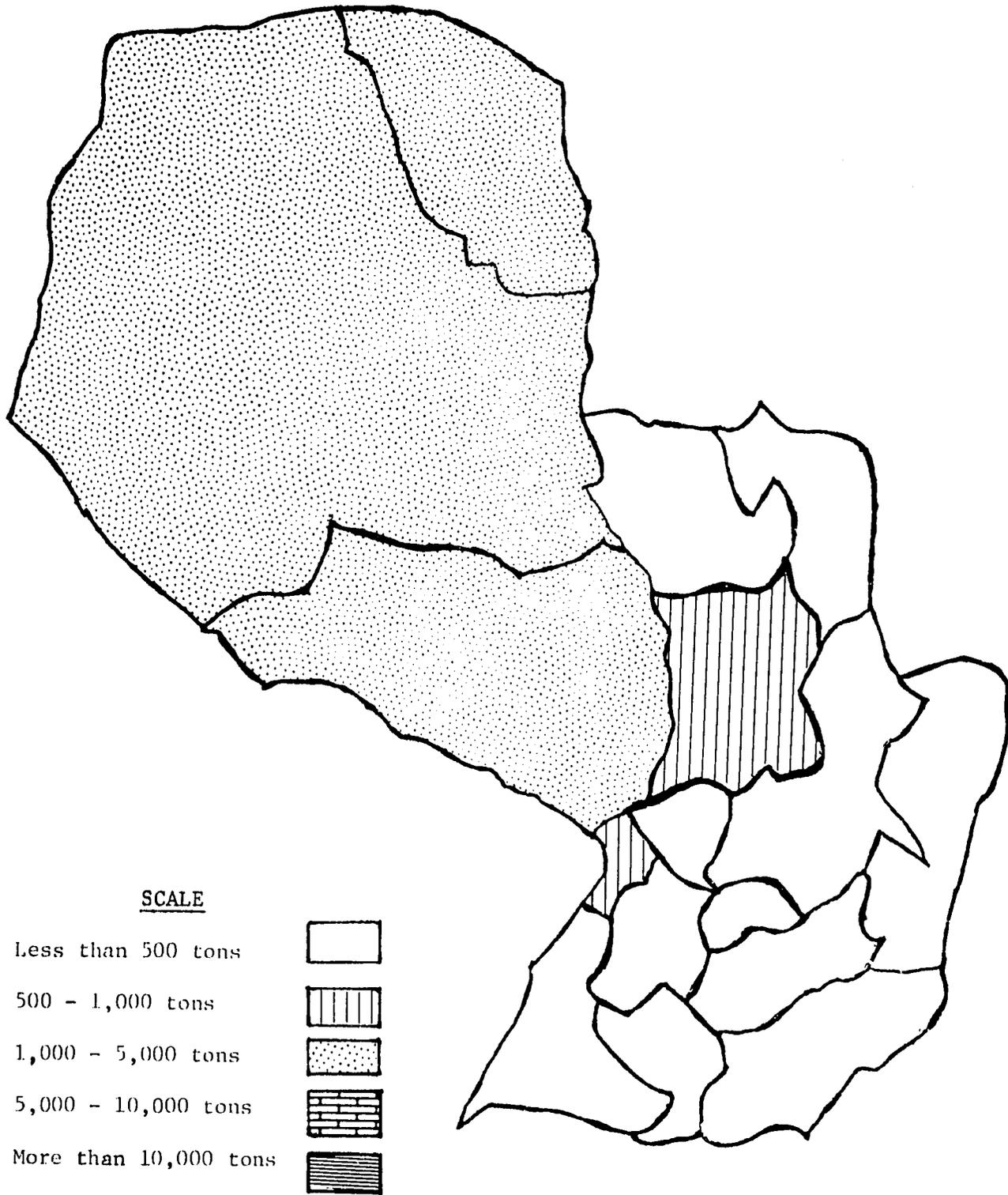
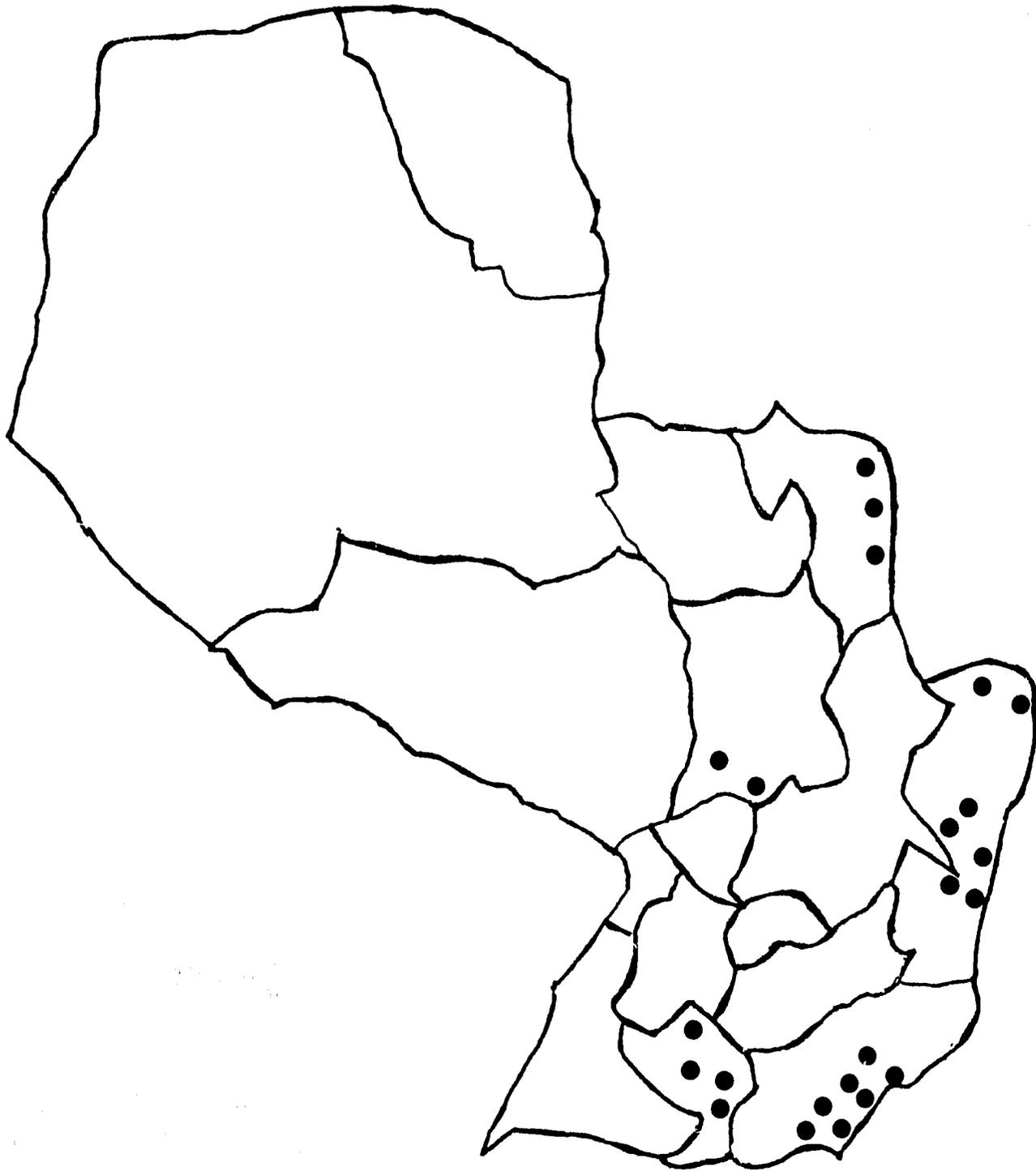


FIGURE 9

CONCENTRATION OF GROWING AREAS OF SOYBEANS, WHEAT AND CORN  
BY SELECTED DEPARTMENTS, 1974



areas of Alto Parana adjacent to Port President Stroessner and other locations heavily affected by major construction activities. All of these concentrated production areas reflect the importance of access to major markets in the location of production areas for cash crops in Paraguay.

Harvested Areas and Yields per Hectare

Tables 3 and 4 summarize the historical data of crop hectares harvested and yields per hectare. The expansion rate of harvested area follows the same trends as production. Yields, for the most part, show slight increases, but tremendous variation from year to year.

The harvested areas for each of the crops show upward trends over the total period. Those for soybeans, corn, cotton, tobacco, and edible beans show significant increases over the past 5 years. Harvested areas of sugar cane and rice have been relatively stable in recent years while wheat has continued to decline in relative importance since 1971.

Since 1970, the average yields per hectare of most of the selected crops have exhibited a general upward trend. The upward trend has been most pronounced for cotton, sugar cane, edible beans, and rice. The yields of corn, tobacco, and wheat have shown little or no improvement over the period and remain quite low compared to those achieved in neighboring countries.

TABLE 3  
HECTARES HARVESTED OF SELECTED CROPS, 1962-1974  
100 Hectares

| Year | Soybeans | Corn | Cotton | Sugar Cane | Tobacco | Edible Beans | Rough Rice | Wheat | Grain Sorghum |
|------|----------|------|--------|------------|---------|--------------|------------|-------|---------------|
| 1962 | N/A      | 949  | 449    | 224        | 130     | 220          | 70         | 80    | N/A           |
| 1963 | N/A      | 960  | 629    | 230        | 200     | 250          | 70         | 100   | N/A           |
| 1964 | N/A      | 1588 | 486    | 267        | 95      | 315          | 80         | 98    | N/A           |
| 1965 | N/A      | 1644 | 567    | 268        | 144     | 315          | 80         | 108   | N/A           |
| 1966 | N/A      | 1503 | 628    | 260        | 70      | 322          | 46         | 72    | N/A           |
| 1967 | N/A      | 1732 | 382    | 260        | 108     | 322          | 73         | 83    | N/A           |
| 1968 | N/A      | 1800 | 372    | 206        | 183     | 300          | 90         | 200   | N/A           |
| 1969 | N/A      | 1275 | 600    | 235        | 200     | 269          | 100        | 343   | N/A           |
| 1970 | 377      | 1874 | 469    | 405        | 135     | 544          | 230        | 447   | N/A           |
| 1971 | 545      | 1901 | 332    | 397        | 164     | 462          | 216        | 515   | N/A           |
| 1972 | 758      | 1844 | 572    | 289        | 175     | 470          | 225        | 321   | N/A           |
| 1973 | 814      | 1856 | 811    | 280        | 204     | 434          | 215        | 203   | 41            |
| 1974 | 1273     | 2601 | 932    | 288        | 242     | 550          | 229        | 303   | 57            |
| 1975 | 1502     | 2428 | 1000   | N/A        | N/A     | N/A          | 276        | 234   | N/A           |

Source: Manual Estadístico Del Paraguay, 1962-1969, Sec. De Coordinación técnica Encuesta Agropecuario  
Por meses, 1970, 1971, 1972, 1973, 1974.

TABLE 4  
 YIELDS PER HECTARE OF SELECTED CROPS, 1962-1974  
 Kilograms

| Year  | Soybeans | Corn | Cotton | Sugar Cane | Tobacco | Edible Beans | Rough Rice | Wheat | Grain Sorghum |
|-------|----------|------|--------|------------|---------|--------------|------------|-------|---------------|
| 1962  | N/A      | 1300 | 651    | 30,000     | 1231    | 800          | 2400       | 900   | N/A           |
| 1963  | N/A      | 1250 | 636    | 30,430     | 1250    | 760          | 2286       | 700   | N/A           |
| 1964  | N/A      | 1297 | 743    | 36,110     | 1263    | 749          | 2500       | 939   | N/A           |
| 1965  | N/A      | 1300 | 741    | 37,000     | 1250    | 750          | 2700       | 650   | N/A           |
| 1966  | N/A      | 1100 | 460    | 37,999     | 1250    | 600          | 2196       | 1000  | N/A           |
| 1967  | N/A      | 1301 | 699    | 38,000     | 1250    | 700          | 2496       | 1101  | N/A           |
| 1968  | N/A      | 1000 | 809    | 34,080     | 1202    | 600          | 2311       | 1000  | N/A           |
| 1969  | N/A      | 1200 | 675    | 35,020     | 1200    | 657          | 2655       | 914   | N/A           |
| 1970  | 1311     | 1380 | 844    | 34,920     | 1312    | 641          | 1966       | 1070  | N/A           |
| 1971  | 1379     | 1208 | 526    | 35,440     | 1108    | 554          | 1797       | 1064  | N/A           |
| 1972  | 1281     | 1135 | 925    | 36,130     | 1343    | 683          | 1944       | 551   | N/A           |
| 1973  | 1508     | 1326 | 1051   | 39,270     | 1311    | 788          | 1941       | 1133  | 1104          |
| 1974  | 1424     | 1366 | 962    | 41,830     | 1341    | 771          | 2213       | 1163  | 1305          |
| *1975 | 1450     | 1200 | 996    | N/A        | N/A     | N/A          | 2040       | 770   | N/A           |

Source: Manual Estadístico Del Paraguay, 1962-1969, Sec. De Coordinación técnica Encuesta Agropecuario  
 Por meses, 1970, 1971, 1972, 1973, 1974.

\* GOP Estimates



## SECTION IV

### CURRENT MARKET DEMAND

The factors affecting the pattern of demand for agricultural food products used for human consumption are (1) population shifts, (2) changes in per capita consumption rates, and (3) export market potentials. The factors affecting demand for agricultural feed and fiber products are (1) industrial raw material requirements, (2) livestock feeding practices, and (3) export market potentials. In many cases, demand for a given commodity may encompass all of these underlying factors.

#### Existing Domestic Consumption Patterns

The key factors affecting the volume of demand for an agricultural food product in any given year are population levels and distribution and the average per capita consumption. Rural and urban population levels for the 1962 and 1972 census years are summarized in Table 5. The combined annual growth rate for Paraguay between these years was 2.38 percent. While the majority of the population resides in a rural area, there is a small but definite trend toward urbanization. This is reflected in the different levels of annual growth rates, urban versus rural. Urban population increased from 35.83 percent of the population in 1962 to 37.42 percent in 1972. Also, a population shift among departments is evident. The rapid rural and urban growth rates in Alto Parana and Amambay reflect the impacts of major dam and hydroelectric construction in these areas.

The average per capita consumption is affected by eating habits and food preference, by average income levels, and by prices of one food product relative to other food products. Generally, rural people have different consumption patterns than urban dwellers, so that the average per capita

TABLE 5

RURAL AND URBAN POPULATION LEVELS,  
1962 and 1972 CENSUS YEARS

Number of Persons

|             | 1962 Census              |                      | 1972 Census        |                      | Rate of Annual Growth (Percent) |       |
|-------------|--------------------------|----------------------|--------------------|----------------------|---------------------------------|-------|
|             | Rural                    | Urban                | Rural              | Urban                | Rural                           | Urban |
|             | Paraguay<br>(Percentage) | 1,167,234<br>(64.17) | 651,869<br>(35.83) | 1,475,610<br>(62.58) | 882,345<br>(37.42)              | 2.34  |
| Asuncion    |                          | 288,832              |                    | 388,958              |                                 | 2.97  |
| DEPARTMENTS |                          |                      |                    |                      |                                 |       |
| Concepcion  | 56,297                   | 29,393               | 76,754             | 31,376               | 3.10                            | 0.65  |
| San Pedro   | 74,372                   | 17,432               | 117,018            | 21,000               | 4.53                            | 1.86  |
| Cordillera  | 155,248                  | 33,065               | 157,305            | 36,913               | 0.13                            | 1.10  |
| Guira       | 83,082                   | 31,867               | 88,447             | 36,352               | 0.63                            | 1.32  |
| Caaguazu    | 105,148                  | 19,990               | 177,643            | 33,215               | 5.24                            | 5.08  |
| Gaazapa     | 76,526                   | 15,875               | 88,251             | 14,888               | 1.43                            | -0.64 |
| Itapua      | 109,755                  | 40,066               | 156,753            | 44,658               | 3.56                            | 1.09  |
| Misiones    | 39,973                   | 19,468               | 47,162             | 22,084               | 1.65                            | 1.26  |
| Paraguari   | 167,825                  | 35,187               | 179,479            | 32,498               | 0.67                            | -0.79 |
| Alto Parana | 12,226                   | 1,941                | 72,408             | 16,199               | 11.86                           | 21.22 |
| Central     | 153,399                  | 75,674               | 173,566            | 136,824              | 1.24                            | 5.92  |
| Neembucu    | 44,251                   | 13,627               | 50,863             | 22,235               | 1.39                            | 4.90  |
| Amambay     | 21,562                   | 12,943               | 40,032             | 25,074               | 6.19                            | 6.61  |
| Chaco       | 57,670                   | 16,459               | 49,929             | 20,066               | -1.44                           | 1.98  |

Source: Censo Nacional de Poblacion y Viviendas, 1962 and 1972, Direccion General de Estadistica Censos

consumption is somewhat different among the two populations. Also, per capita consumption may vary between geographical locations.

Table 6 lists the available data on per capita consumption by food product groups in Paraguay. These data are based exclusively on three reports that were available.<sup>1</sup> The National Nutritional Survey was comprehensive, where the other two studies were limited in scope. Therefore, differences do exist and certain constraints must be imposed. The basic problem is that with the limited data available, only a linear approximation of current per capita consumption for the total population can be developed.

Based upon the increasing average per capita income as detailed in Table 7, the trends in consumption among the various food groups are realistic with the exception of corn products. There is no way, based on the available data, to explain the large increase in average per capita human consumption of corn indicated between 1965 and 1972. The indicated annual growth rate cannot be treated as reliable.

Per capita consumption figures for the rural and urban population were constructed for 1965 from the National Nutritional Survey, but no work was available from which to construct similar figures for 1972. Consequently, no trends in average per capita consumption for the rural and urban segments could be determined. Other problems exist within the current available data. For instance, the same rate of average per capita consumption of rice for rural and urban populations is subject to challenge. While this pattern is entirely possible, it is contrary to expectations and

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<sup>1</sup>See source notes, Table 6.

is the only food group with this characteristic. Other data sources indicate that domestic sugar consumption for 1973 was 52,000 metric tons. This would indicate an average per capita consumption of 21.44 kilograms per annum much higher than would be calculated from Table 6. Flour milling data, by physical volume for 1965 through 1974, indicate there may have been a greater decrease in per capita consumption during the early 70's than would be indicated by Table 6. Since these areas of conflict cannot be reconciled from available data, Table 6 will be used as the base for projection of the domestic market potentials. However, it is strongly suggested that additional comprehensive household surveys be conducted so that more accurate trends for domestic consumption of agricultural food products may be established.

While there are apparent shifts among food groups, due to price and income factors, average per capita consumption of most food products has increased. This upward trend, together with the increasing population, causes a gradual but continual expansion in the domestic market for food products.

#### Historical Export Patterns

Historical patterns of export of agricultural commodities are shown by the figures in Tables 8 and 9. Demand for Paraguay export products listed in these tables depends on the condition of world demand and world production as reflected by world prices of each of the commodities.

Agricultural products, excluding forestry products, make up 75 percent of total value of Paraguay's exports. The total exportation includes a broad array of products, both raw and processed. The predominant markets among commodities are quite varied.

TABLE 6  
PER CAPITA CONSUMPTION OF FOOD BY GROUPS  
Kilograms per Annum\*

| FOOD GROUP     | 1965** |        |        | 1971*** |       |       | 1972**** |       |        | PERCENTAGE ANNUAL<br>GROWTH<br>1965 - 1972 |
|----------------|--------|--------|--------|---------|-------|-------|----------|-------|--------|--|
|                | RURAL  | URBAN  | TOTAL  | RURAL   | URBAN | TOTAL | RURAL    | URBAN | TOTAL  |  |
| Wheat Products | 22.27  | 66.07  | 37.95  |         | 83.6  |       |          |       | 35.97  | -0.8451                                    |
| Rice           | 13.14  | 13.14  | 13.14  |         | 30.7  |       |          |       | 14.60  | 1.5052                                     |
| Corn Products  | 13.14  | 5.84   | 10.59  |         |       |       |          |       | 21.90  | 10.3797                                    |
| Tubers         | 231.05 | 124.10 | 192.72 |         | 94.4  |       |          |       | 173.01 | -1.5413                                    |
| Vegetables     | 10.95  | 26.65  | 16.43  |         |       |       |          |       | 25.92  | 6.5129                                     |
| Fruits         | 110.60 | 94.54  | 104.39 |         |       |       |          |       | 117.17 | 1.6499                                     |
| Sugar          | 6.94   | 20.08  | 11.32  |         | 35.3  |       |          |       | 12.78  | 1.7330                                     |
| Beans          | 12.41  | 2.19   | 8.76   |         |       |       |          |       | 9.49   | 1.1435                                     |
| Meats          | 44.90  | 61.32  | 46.72  |         | 77.1  |       |          |       | 50.74  | 1.1792                                     |
| Eggs           | 4.75   | 4.38   | 4.38   |         |       |       |          |       | 6.57   | 6.0082                                     |
| Dairy Products | 24.45  | 55.48  | 32.49  |         | 66.85 |       |          |       | 51.47  | 6.5724                                     |
| Oils & Fats    | 7.57   | 8.03   | 7.67   |         | 12.75 |       |          |       | 9.86   | 3.5881                                     |

\*All blank spaces indicate data not available.

\*\*Nutrition Survey, Republic of Paraguay, May-August 1965, U.S. Department of H.E.W., Public Health Service, August, 1967.

\*\*\* Food Marketing Household Survey in Asuncion, Paraguay, with Emphasis on Purchasing Habits and Consumption by Household Units in Two Working Class Barrios," Glen H. Mitchell, 1971.

\*\*\*\*Diagnostico De La Situacion Alimentaria y Nutricional, Vol. I, Sintesis y Conclusiones (Version - Preliminar), Secretaria Tecnica de Planificacion Oficina Nacional de Progress Social, Asuncion, Paraguay, 1975 (Unknown data Sources - no apparent household survey).

TABLE 7  
AVERAGE PER CAPITA INCOME IN PARAGUAY, 1962-1974\*

| YEAR | PER CAPITA<br>INCOME<br>(GUARINES) | RATE OF GROWTH**<br>(PERCENT) |
|------|------------------------------------|-------------------------------|
| 1962 | 29,993                             | -----                         |
| 1963 | 29,800                             | -0.6                          |
| 1964 | 30,257                             | 1.5                           |
| 1965 | 31,243                             | 3.3                           |
| 1966 | 30,135                             | -3.5                          |
| 1967 | 30,595                             | 1.5                           |
| 1968 | 30,732                             | 0.4                           |
| 1969 | 31,161                             | 1.4                           |
| 1970 | 32,801                             | 5.3                           |
| 1971 | 33,516                             | 2.2                           |
| 1972 | 35,561                             | 6.1                           |
| 1973 | 37,676                             | 5.9                           |
| 1974 | 40,579                             | 7.7                           |

\*Constant 1972 Guarines

\*\*Annual growth rate of 2.21 over the listed time period

Source: Banco Central Del Paraguay, Departments de Estudios Economicos,  
Cuentas Nacionales 1974 (July, 1975)

Commodities having strong growth over the recent time period are processed beef, soybeans and soybean products, cotton and cotton by-products, and tobacco. All other agricultural export commodities have either been stable or show extreme fluctuation in export volumes.

Because of Paraguay's geographical location and the proximity of its borders to Brazil and Argentina, the problem of "unofficial" or "unregistered" exports arises. While it is not the intent of this report to deal with such problems, this is the environment in which agricultural export trade must function and an awareness of the problem is necessary for understanding utilization patterns of agricultural production going to export markets. Also to be understood are current problems with Argentina trade due to that country's extreme rate of inflation and the political closing of borders to trade. While it is not expected that this will be of long-term consequence, these types of factors cause irregularities in trade volumes and must be accounted for.

#### Historical Supply and Utilization Patterns

The supply-utilization tables for wheat, cotton, corn, tobacco, rice and soybeans for 1965 through 1970 are shown in Tables 10 through 15. The production, registered imports, registered exports, and industrial uses are taken from available data. Losses, seed requirements, domestic consumption, animal feed use, and certain industrial uses were calculated as explained in table footnotes. The resulting balance is change in carryover plus any unregistered exports and/or imports that may have occurred. This resulting balance cannot be separated into its components because of the absence of data on unregistered exports (imports).

TABLE 8  
REGISTERED EXPORTS OF SELECTED CROP PRODUCTS, 1962-1975  
(Metric Tons)

|                        | : | 1962   | : | 1963   | : | 1964   | : | 1965   | : | 1966   | : | 1967   | : | 1968   |
|------------------------|---|--------|---|--------|---|--------|---|--------|---|--------|---|--------|---|--------|
| Castor Beans           |   | 13,706 |   | 10,815 |   | 11,775 |   | 13,987 |   | 2,026  |   | 5,368  |   | 10,580 |
| Soybeans               |   |        |   |        |   |        |   | 1,306  |   | 4,346  |   | 1,300  |   | 3,000  |
| Corn                   |   | 6,495  |   | 4,836  |   | 9,144  |   | 7,726  |   | 4,465  |   | 9,430  |   | 3,329  |
| Rice (rough)           |   |        |   |        |   |        |   |        |   |        |   |        |   | 50     |
| Grain Sorghum          |   |        |   |        |   |        |   | 120    |   |        |   |        |   |        |
| Coffee Beans (Raw)     |   | 5,266  |   | 6,138  |   | 4,936  |   | 5,227  |   | 2,850  |   | 2,299  |   | 2,762  |
| Coffee Beans (Toasted) |   | 3      |   | 24     |   | 17     |   | 216    |   | 6      |   | 86     |   | 116    |
| Soybean Cake           |   | 1,364  |   | 1,325  |   | 1,910  |   | 3,494  |   | 1,198  |   | 4,000  |   | 950    |
| Soybean Meal           |   |        |   |        |   | 450    |   | 2,140  |   | 220    |   | 583    |   | 200    |
| Soybean Pellets        |   |        |   | 1,150  |   | 11,546 |   | 8,276  |   | 10,008 |   | 2,082  |   | 21,081 |
| TOTAL                  |   | 1,364  |   | 2,475  |   | 13,906 |   | 13,906 |   | 11,426 |   | 6,665  |   | 22,231 |
| Cottonseed Products    |   | 5,060  |   | 4,701  |   | 5,209  |   | 5,856  |   | 3,450  |   | 3,500  |   | 3,650  |
| Peanut Cake            |   | 2,198  |   | 1,678  |   | 695    |   | 1,234  |   | 1,781  |   | 279    |   |        |
| CocoKernel Products    |   | 2,198  |   | 1,678  |   | 695    |   | 1,894  |   | 2,379  |   | 2,453  |   | 1,954  |
| Tobacco (All)          |   | 11,902 |   | 10,017 |   | 12,659 |   | 14,787 |   | 8,029  |   | 11,562 |   | 15,007 |
| Cotton (All)           |   | 6,961  |   | 8,865  |   | 9,655  |   | 10,810 |   | 5,665  |   | 6,271  |   | 4,451  |
| Processed Beef         |   | 16,987 |   | 23,505 |   | 23,046 |   | 28,961 |   | 20,475 |   | 27,532 |   | 27,532 |
| Sugar                  |   | 8      |   | 6,000  |   | 2,400  |   | 479    |   | 68     |   | 8      |   | 340    |

Continued

TABLE 8 Continued

|                        | 1969   | 1970   | 1971   | 1972   | 1973   | 1974    | 1975    |
|------------------------|--------|--------|--------|--------|--------|---------|---------|
| Castor Beans           | 10,789 | 17,075 | 10,119 | 12,578 | 6,458  | 19,072  | 12,590* |
| Soybeans               | 875    |        | 12,000 | 41,467 | 53,447 | 100,651 | 99,197* |
| Corn                   | 19     | 23,281 | 15,036 | 862    | 3,241  | 4,580   | 5,815   |
| Rice (rough)           |        | 50     | 1,320  | 192    | 562    | 1,370   | 1,400*  |
| Grain Sorghum          |        | 1,800  | 800    |        |        | 1,350   |         |
| Coffee Beans (Raw)     | 1,464  | 1,208  | 1,436  | 4,114  | 2,843  | 4,025   | 5,935   |
| Coffee Beans (Toasted) | 53     | 61     | 37     | 36     |        |         |         |
| Soybean Cake           | 500    |        | 2,150  | 1,930  | 13,065 | 1,400   |         |
| Soybean Meal           | 395    | 4,542  | 27,176 | 10,690 | 1,600  | 1,300   | 900*    |
| Soybean Pellets        | 22,185 | 23,430 | 236    | 14,876 | 27,416 | 27,193  | 25,589* |
| TOTAL                  | 23,080 | 27,972 | 29,563 | 27,496 | 42,081 | 29,893  | 26,489  |
| Cottonseed Products    | 7,190  | 7,570  | 2,068  | 7,960  | 15,386 | 18,514  | 28,120* |
| Peanut Cake            | 200    | 700    | 600    | 1,300  | 1,420  |         |         |
| Coco Kernel Products   | 1,200  | 18,828 | 2,164  | 1,800  | 2,000  |         |         |
| Tobacco (All)          | 19,650 | 19,344 | 16,069 | 21,451 | 17,524 | 24,055  | 24,959  |
| Cotton (All)           | 8,558  | 11,216 | 2,886  | 7,592  | 18,605 | 17,464  | 26,525  |
| Processed Beef         | 17,211 | 23,994 | 25,510 | 32,939 | 35,531 | 18,842  | 21,308  |
| Sugar                  | 340    | 108    | 8      | 11,754 | 6,500  | 20,000  | 13,580  |

\*Not listed separately in source, estimated from reported table by class

Source: Department of Economic Studies. Central Bank of Paraguay Monthly Statistical Bulletin, No. 211, December 1975 and previous issues, Asuncion.

TABLE 9  
 VALUE OF REGISTERED EXPORTS, 1954-1975  
 (GS 1000)

| MAIN CUSTOMERS | WOOD<br>PRODUCTS*    | LIVESTOCK<br>PRODUCTS | TOBACCO<br>***              | OILSEEDS | CORN                                 | YERBA MATE            | FRUITS AND<br>VEGETABLES |
|----------------|----------------------|-----------------------|-----------------------------|----------|--------------------------------------|-----------------------|--------------------------|
|                | Argentina,<br>Brazil | U.S.A. and<br>Europe  | France,<br>U.S.A.,<br>Spain | Europe   | Puerto Rico,<br>Brazil,<br>Argentina | Argentina,<br>Uruguay | Argentina                |
| 1954           | 15,159               | 3,961                 | 893                         | 18       | 119                                  | 1,133                 | 619                      |
| 1955           | 18,666               | 3,850                 | 954                         |          | 12                                   | 1,283                 | 565                      |
| %              | 53.2                 | 11.0                  | 2.7                         |          |                                      | 3.7                   | 1.6                      |
| 1956           | 18,331               | 4,827                 | 1,340                       | 45       | 464                                  | 598                   | 219                      |
| 1957           | 13,912               | 6,662                 | 969                         | 98       | 1,241                                | 736                   | 412                      |
| 1958           | 13,215               | 10,296                | 694                         | 160      | 688                                  | 1,236                 | 316                      |
| 1959           | 7,619                | 13,359                | 639                         | 312      | 422                                  | 1,623                 | 193                      |
| 1960           | 7,982                | 9,489                 | 1,587                       | 326      | 734                                  | 2,486                 | 221                      |
| 1961           | 9,111                | 10,803                | 1,528                       | 688      | 321                                  | 1,487                 | 224                      |
| 1962           | 9,190                | 9,324                 | 3,091                       | 822      | 250                                  | 920                   | 309                      |
| 1963           | 7,548                | 12,200                | 3,156                       | 774      | 145                                  | 878                   | 340                      |
| 1964           | 11,125               | 16,369                | 3,741                       | 982      | 288                                  | 1,348                 | 406                      |
| 1965           | 13,261               | 20,387                | 4,293                       | 1,182    | 246                                  | 1,603                 | 561                      |
| %              | 23.0                 | 35.4                  | 7.5                         | 2.0      | 0.4                                  | 2.8                   | 1.0                      |
| 1966           | 13,853               | 16,828                | 2,475                       | 639      | 47                                   | 1,647                 | 609                      |
| 1967           | 9,699                | 19,022                | 3,370                       | 418      | 283                                  | 633                   | 375                      |
| 1968           | 10,052               | 14,866                | 4,523                       | 869      | 99                                   | 616                   | 466                      |
| 1969           | 13,636               | 12,911                | 5,626                       | 912      | 1                                    | 585                   | 275                      |
| 1970           | 14,602               | 17,152                | 5,765                       | 1,511    | 635                                  | 510                   | 305                      |
| 1971           | 12,623               | 22,591                | 4,765                       | 1,848    | 477                                  | 105                   | 1,372                    |
| 1972           | 11,894               | 33,914                | 6,681                       | 4,984    | 23                                   | 312                   | 579                      |
| 1973           | 14,181               | 44,957                | 7,457                       | 12,155   | 186                                  | 63                    | 569                      |
| 1974           | 25,571               | 40,026                | 11,442                      | 20,392   | 416                                  | 225                   | 2,646                    |
| 1975           | 30,404               | 34,488                | 12,017                      | 19,092   | 572                                  | 269                   | 5,744                    |
| %              | 17.3                 | 19.6                  | 6.8                         | 10.8     | 0.3                                  | 0.3                   | 3.3                      |

Continued

TABLE 9 Continued

|                | COFFEE | COTTON                         | SUGAR &<br>PRODUCTS<br>*** | VEGETABLE<br>OILS        | ESSENCE<br>OILS<br>*** | VEGETABLE<br>MEALS   | TOTAL ** |
|----------------|--------|--------------------------------|----------------------------|--------------------------|------------------------|----------------------|----------|
| MAIN CUSTOMERS | U.S A. | Belgium,<br>Germany,<br>France | U.S A.                     | Europe,<br>Latin America | U.S. &<br>Europe       | Europe,<br>Argentina |          |
| 1954           |        | 6,348                          | 101                        | 3,069                    | 1,421                  | 138                  | 33,970   |
| 1955           |        | 5,499                          | 223                        | 1,939                    | 1,253                  | 97                   | 35,097   |
| %              |        | 15.7                           | 0.6                        | 5.5                      | 3.6                    | 0.3                  | 100.0    |
| 1956           |        | 5,604                          |                            | 1,398                    | 1,166                  | 233                  | 36,691   |
| 1957           |        | 4,497                          | 2                          | 3,166                    | 1,290                  | 291                  | 32,898   |
| 1958           | 24     | 3,731                          | 593                        | 1,509                    | 796                    | 285                  | 34,102   |
| 1959           | 693    | 2,085                          | 1,081                      | 1,675                    | 956                    | 231                  | 31,196   |
| 1960           | 765    | 297                            | 99                         | 1,542                    | 1,008                  | 140                  | 26,978   |
| 1961           | 993    | 1,598                          | 335                        | 1,884                    | 1,054                  | 276                  | 30,677   |
| 1962           | 2,835  | 2,469                          | 45                         | 2,330                    | 1,078                  | 353                  | 33,467   |
| 1963           | 3,306  | 3,199                          | 677                        | 6,083                    | 1,283                  | 451                  | 40,189   |
| 1964           | 3,180  | 4,197                          | 418                        | 3,983                    | 1,456                  | 563                  | 49,771   |
| 1965           | 3,644  | 4,687                          | 85                         | 3,197                    | 1,127                  | 693                  | 57,267   |
| %              | 6.3    | 8.1                            |                            | 5.6                      | 2.0                    | 1.2                  | 100.0    |
| 1966           | 1,959  | 1,988                          | 9                          | 4,330                    | 1,398                  | 566                  | 49,385   |
| 1967           | 1,458  | 2,290                          | 30                         | 4,572                    | 1,485                  | 525                  | 48,259   |
| 1968           | 1,895  | 1,395                          | 63                         | 4,756                    | 1,676                  | 970                  | 47,575   |
| 1969           | 953    | 3,205                          | 27                         | 6,703                    | 1,748                  | 1,280                | 50,953   |
| 1970           | 882    | 4,048                          | 31                         | 6,992                    | 2,046                  | 2,490                | 64,071   |
| 1971           | 1,016  | 835                            | 144                        | 8,166                    | 2,315                  | 503                  | 65,204   |
| 1972           | 3,116  | 3,815                          | 2,143                      | 5,694                    | 3,006                  | 1,473                | 86,188   |
| 1973           | 2,667  | 11,622                         | 1,349                      | 6,603                    | 7,662                  | 10,099               | 126,927  |
| 1974           | 3,787  | 16,500                         | 10,099                     | 13,354                   | 8,372                  | 5,021                | 169,808  |
| 1975           | 8,718  | 20,107                         | 6,814                      | 10,614                   | 9,755                  | 4,404                | 176,014  |
| %              | 5.0    | 11.4                           | 3.9                        | 6.0                      | 5.5                    | 2.5                  | 100.0    |

\*Including Quebrocho extract

\*\*Categories included in the total but not itemized, together with the 1974 values are (1) Portland cement - 1,034, (2) Palm hearts - 117, (3) Furs - 794, (4) Industrial Products - 9,060; Other - 746.

\*\*\*Based on AFORO system - value cannot be divided by volume to obtain real average prices.

Source: Same as previous table.

TABLE 10  
SUPPLY AND UTILIZATION OF WHEAT, 1965 - 1975

Metric Tons

|   | :      | :      | :      | :       | :      |
|---|--------|--------|--------|---------|--------|
|   | :      | :      | :      | :       | :      |
|   | 1965   | 1966   | 1967   | 1968    | 1969   |
| PRODUCTION  | 7,040  | 7,200  | 9,160  | 20,000  | 31,376 |
| Less Loss*  | 704    | 720    | 916    | 2,000   | 3,138  |
| Less Seed**   | 736    | 849    | 2,045  | 3,508   | 4,571  |
| NET PRODUCTION  | 5,600  | 5,631  | 6,199  | 14,492  | 23,667 |
| REGISTERED IMPORTS***   | 78,404 | 71,864 | 84,987 | 91,606  | 67,431 |
| NET AVAILABLE PRODUCT   | 84,004 | 77,495 | 91,186 | 106,098 | 91,098 |
| Flour Milled in<br>Wheat Equivalent****                       | 79,868 | 83,289 | 78,816 | 88,414  | 89,603 |
| Change in Carryover<br>Plus Unregistered<br>Exports (Imports) | 4,136  | -5,794 | 12,370 | 17,684  | 1,495  |

Continued

TABLE 10 Continued

| ⋮<br>⋮<br>⋮ | ⋮<br>⋮<br>⋮ | ⋮<br>⋮<br>⋮ | ⋮<br>⋮<br>⋮ | ⋮<br>⋮<br>⋮ | ⋮<br>⋮<br>⋮ |
|-------------|-------------|-------------|-------------|-------------|-------------|
| 1970        | 1971        | 1972        | 1973        | 1974        | 1975        |
| 47,650      | 54,811      | 17,683      | 23,000      | 35,245      | 37,243      |
| 4,765       | 5,481       | 1,768       | 2,300       | 3,525       | 3,724       |
| 5,267       | 3,283       | 2,056       | 3,099       | 4,091       | 4,326       |
| 32,618      | 46,047      | 13,859      | 17,601      | 27,629      | 29,193      |
| 71,593      | 61,714      | 55,150      | 33,424      | 71,162      | 25,398      |
| 104,211     | 107,761     | 69,009      | 51,025      | 98,791      | 54,591      |
| 92,674      | 83,217      | 78,836      | 67,225      | 65,738      | 66,482      |
| 11,537      | 24,544      | -9,827      | -16,200     | 33,053      | -11,891     |

\* 10% Estimate based on storage losses (El Acopio, Publication #2, Ministerio de Agricultura y Granaderia, Direccion de Comercializacion y Economia Agropecuaria, August, 1972) plus field losses.

\*\* Based on estimate of 02.27 per Ha

\*\*\* Imports of wheat and wheat products, not segregated

\*\*\*\* Based on conversion factor of .76

TABLE 11

SUPPLY AND UTILIZATION OF COTTON, 1965 - 1975

Metric Tons

|  | :      | :      | :      | :      | :      |
|--|--------|--------|--------|--------|--------|
|  | :      | :      | :      | :      | :      |
|  | 1965   | 1966   | 1967   | 1968   | 1969   |
| PRODUCTION   | 42,000 | 28,900 | 26,700 | 30,100 | 40,500 |
| Loss*  | 2,100  | 1,445  | 1,335  | 1,505  | 2,025  |
| NET PRODUCTION   | 39,900 | 27,455 | 25,365 | 28,595 | 38,475 |
| FIBRE TONNAGE**  | 12,688 | 8,731  | 8,067  | 9,093  | 12,235 |
| EXPORT TONNAGE   | 10,810 | 5,665  | 6,271  | 4,451  | 8,558  |
| INDUSTRIAL USE***  | 2,307  | 2,012  | 2,322  | 2,462  | 2,617  |
| Change in Carryover,<br>Plus Unregistered<br>Exports (Imports) | -429   | 1,054  | -526   | 2,180  | 1,060  |

TABLE 11 Continued

| 1970   | 1971   | 1972   | 1973   | 1974   | 1975   |
|--------|--------|--------|--------|--------|--------|
| 39,667 | 17,485 | 52,938 | 85,241 | 89,696 | 99,600 |
| 1,983  | 874    | 2,647  | 4,262  | 4,485  | 4,930  |
| 37,684 | 16,611 | 50,291 | 80,979 | 85,211 | 94,620 |
| 11,984 | 5,282  | 15,993 | 25,751 | 27,097 | 30,089 |
| 11,216 | 2,886  | 7,592  | 18,605 | 17,464 | 26,525 |
| 2,856  | 2,898  | 2,983  | 2,955  | 3,263  | 3,391  |
| -2,088 | -502   | 5,418  | 4,191  | 6,370  | 173    |

\* 5%, Footnote 1, Table 10.

\*\* Ginning rate of 31.8 percent fiber based on 1973 processing year.

\*\*\* Based upon industrial production data, cotton cloth, 1000's of meters manufactured (average weight per meter of cloth of varying thickness 0.1407 Kg.).

TABLE 12  
 SUPPLY AND UTILIZATION OF CORN, 1965 - 1975

|  | :<br>: 1965 | :<br>: 1966 | :<br>: 1967 | :<br>: 1968 | :<br>: 1969 |
|--|-------------|-------------|-------------|-------------|-------------|
| PRODUCTION   | 210,000     | 165,400     | 225,000     | 180,000     | 153,000     |
| Loss*  | 21,000      | 16,540      | 22,500      | 18,000      | 15,300      |
| Seed**   | 1,913       | 2,204       | 2,291       | 1,623       | 2,385       |
| NET PRODUCTION   | 187,087     | 146,656     | 200,209     | 160,377     | 135,315     |
| EXPORT   | 7,726       | 1,465       | 9,340       | 3,329       | 19          |
| Domestic Human<br>Consumption***                               | 20,821      | 23,703      | 26,989      | 30,729      | 34,985      |
| Estimated Animal<br>Feeds****                                  | 108,076     | 111,454     | 116,061     | 117,468     | 120,046     |
| Change in Carryover,<br>Plus Unregistered<br>Exports (Imports) | 50,464      | 10,034      | 47,729      | 8,851       | -19,735     |

TABLE 12 Continued

| :       | :       | :       | :       | :       | :       |
|---------|---------|---------|---------|---------|---------|
| :       | :       | :       | :       | :       | :       |
| 1970    | 1971    | 1972    | 1973    | 1974    | 1975    |
| 258,703 | 229,780 | 209,284 | 246,075 | 281,595 | 291,400 |
| 25,870  | 22,979  | 20,928  | 24,608  | 28,160  | 29,140  |
| 2,419   | 2,347   | 2,362   | 2,623   | 3,090   | 3,171   |
| 230,414 | 204,460 | 185,994 | 218,844 | 250,345 | 259,089 |
| 23,281  | 15,036  | 862     | 3,241   | 4,580   | 5,815   |
| 39,835  | 45,354  | 51,639  | 58,916  | 67,237  | 76,754  |
| 117,447 | 118,722 | 123,151 | 133,858 | 151,858 | 135,555 |
| 49,851  | 25,348  | 10,342  | 22,829  | 26,670  | 40,965  |

\* 10%, Footnote 1, Table 10.

\*\* Based on estimates of 12.73 Kg. per Ha.

\*\*\* Based on Per capita Consumption (Table 6).

\*\*\*\* Based on estimate of commercial and non-commercial use of corn for feed.

1. Wheat (Table 10)

Net production of wheat rose from 7.0 percent of milling volume in 1965 to 43.0 percent of milling volume in 1970, but the percentage has declined thereafter. Tonnage milled indicates that there may have been a decrease in the use of wheat products during the 1972-1975 period because of price increases.

2. Cotton (Table 11)

While supply of cotton increased over the time period, exports increased proportionately so that a stable percentage of product was exported over this time period.

3. Corn (Table 12)

Construction of corn utilization is difficult because of the unknown factor of feed use. An estimate of this use was constructed based on a 1974 sample survey of feed mills, hog and poultry numbers, and egg and milk production. Increases in production, with minimal registered exportation and the rather high level of domestic human consumption indicates that the use of corn as animal feed is quite large. Considering the size of the remaining balance, it may be that the feed use estimate is too conservative, or that production to market loss is too conservative.

4. Tobacco (Table 13)

Increases in net production are matched by relative increases in exports.

5. Rice (Table 14)

The basic problem is one of unknown or inaccurate data. Domestic consumption based on Table 6 indicates that rice would have to be imported to supplement domestic production. Domestic consumption,

based on disappearance, would indicate a level of per capita consumption one-half of the 1965 nutritional survey level. Although this level would increase proportionately faster over time, it would only be 2/3 of the Table 6 indication by 1975. These discrepancies are reflected in the negative carry-over figures indicated by the last line of Table 14.

6. Soybeans (Table 15)

Sharp production increases occurred during the 1970's, resulting in sharp increases in exports of whole soybeans and soybean products. The resulting balance indicates that substantial tonnage flowed across international borders without governmental control. Apparently very minimal amounts of soybean products were consumed in the domestic market. This market constraint forces production to rely virtually on world market demand.

Demand for Industrial Processing

The growth of industrial output using raw agricultural materials has been quite limited. While production output increased during the 1964-1974 period, it did so at varying rates of growth. These annual rates of growth ranged from -0.62 percent for wheat flour milling, to 6.12 percent for essence oil processing. Cotton cloth and processed sugar production grew steadily over this time, increasing at an annual rate of 3.96 and 3.77 percent respectively. Coco, castor, and tung oils as well as beef product production increased, although extreme variability occurred from year to year. The highest point in production for these two product groups was reached in the early 70's and production has been declining since that time.

TABLE 13  
SUPPLY AND UTILIZATION OF TOBACCO, 1965 - 1975  
Metric Tons

|  | :<br>: 1965<br>: | :<br>: 1966<br>: | :<br>: 1967<br>: | :<br>: 1968<br>: | :<br>: 1969<br>: |
|--|------------------|------------------|------------------|------------------|------------------|
| PRODUCTION   | 18,000           | 8,750            | 13,500           | 22,000           | 24,060           |
| Loss*  | 2,700            | 1,313            | 2,025            | 3,300            | 3,600            |
| NET PRODUCTION   | 15,300           | 7,437            | 11,475           | 18,700           | 20,400           |
| EXPORT   | 14,787           | 8,029            | 11,562           | 15,007           | 19,650           |
| Change in Carryover,<br>Plus Industrial Use<br>and Unregistered<br>Exports (Imports) | 513              | -79              | -166             | 3,527            | 4,277            |

TABLE 13 Continued

| :      | :      | :      | :      | :      | :      |
|--------|--------|--------|--------|--------|--------|
| : 1970 | : 1971 | : 1972 | : 1973 | : 1974 | : 1975 |
| :      | :      | :      | :      | :      | :      |
| 17,723 | 18,218 | 23,496 | 26,750 | 32,411 | 28,357 |
| 2,658  | 2,733  | 3,524  | 4,013  | 4,862  | 4,254  |
| 15,065 | 15,485 | 19,972 | 22,737 | 27,549 | 24,103 |
| 19,344 | 16,069 | 21,451 | 17,524 | 24,055 | 24,959 |
| -2     | -589   | -2,068 | 3,145  | 6,639  | -856   |

\* 15%, Footnote 1, Table 10.

\*\* Trend projection.

TABLE 14  
 SUPPLY AND UTILIZATION OF RICE, 1965 - 1975  
 Metric Tons

|  | :       | :       | :       | :       | :       |
|--|---------|---------|---------|---------|---------|
|  | : 1965  | : 1966  | : 1967  | : 1968  | : 1969  |
|  | :       | :       | :       | :       | :       |
| PRODUCTION (Rough Rice)  | 21,600  | 10,100  | 18,170  | 20,800  | 27,160  |
| Loss*  | 2,160   | 1,010   | 1,817   | 2,080   | 2,716   |
| Seed**   | 784     | 1,244   | 1,534   | 1,705   | 3,920   |
| NET PRODUCTION   | 18,656  | 7,846   | 14,819  | 17,015  | 20,524  |
| EXPORTS (Rough Rice)   |         |         |         |         |         |
| MILLED RICE AVAILABLE***                                       | 12,126  | 5,100   | 9,632   | 11,080  | 13,341  |
| Domestic Human<br>Consumption, Milled<br>Rice****              | 25,835  | 27,714  | 28,043  | 29,216  | 30,438  |
| Change in Carryover,<br>Plus Unregistered<br>Exports (Imports) | -13,709 | -22,614 | -18,411 | -18,156 | -17,097 |

TABLE 14 Continued

| :      | :      | :       | :       | :       | :       |
|--------|--------|---------|---------|---------|---------|
| : 1970 | : 1971 | : 1972  | : 1973  | : 1974  | : 1975  |
| :      | :      | :       | :       | :       | :       |
| 45,218 | 38,807 | 43,743  | 41,733  | 50,688  | 56,280  |
| 4,522  | 3,881  | 4,374   | 4,173   | 5,069   | 5,628   |
| 3,682  | 3,835  | 3,665   | 3,903   | 4,704   | 5,113   |
| 37,014 | 31,091 | 35,704  | 33,657  | 40,915  | 45,539  |
| 50     | 1,320  | 195     | 562     | 1,370   | 1,470   |
| 24,027 | 19,351 | 23,083  | 21,512  | 25,704  | 28,645  |
| 31,713 | 33,042 | 34,426  | 36,088  | 37,532  | 39,209  |
| -7,686 | -1,369 | -11,343 | -14,575 | -11,828 | -10,564 |

\* 10%, Footnote 1, Table 10.

\*\* Based on estimate of 170.46 Kg/ha.

\*\*\* Milling Conversion rate of 65%.

\*\*\*\* Based on Per capita consumption (Table 6).

TABLE 15  
 SUPPLY AND UTILIZATION OF SOYBEANS, 1965 - 1975  
 Metric Tons

|   | :<br>: 1965<br>: | :<br>: 1966<br>: | :<br>: 1967<br>: | :<br>: 1968<br>: | :<br>: 1969<br>: |
|---|------------------|------------------|------------------|------------------|------------------|
| PRODUCTION  | 18,000           | 20,000           | 18,000           | 13,500           | 22,000           |
| Loss*   | 1,800            | 2,000            | 1,800            | 1,350            | 2,200            |
| Seed**  | 1,244            | 1,129            | 843              | 1,366            | 3,248            |
| NET PRODUCTION  | 14,956           | 16,871           | 15,357           | 10,784           | 16,552           |
| REGISTERED EXPORTS  |                  |                  |                  |                  |                  |
| Whole Soybeans  | 1,306            | 4,346            | 1,300            | 3,000            | 875              |
| Registered Exports of<br>Soybean Products in<br>Soybean Equivalent*** | 17,026           | 13,985           | 8,158            | 27,211           | 28,250           |
| Change in Carryover,<br>Plus Unregistered<br>Exports (Imports)        | -3,376           | -1,460           | 5,899            | -19,427          | -12,573          |

TABLE 15 Continued

| :      | :      | :      | :       | :       | :       |
|--------|--------|--------|---------|---------|---------|
| : 1970 | : 1971 | : 1972 | : 1973  | : 1974  | : 1975  |
| :      | :      | :      | :       | :       | :       |
| 52,065 | 75,132 | 97,081 | 122,637 | 181,262 | 217,500 |
| 5,207  | 7,513  | 9,708  | 12,264  | 18,126  | 21,750  |
| 4,459  | 6,202  | 6,661  | 10,416  | 12,290  | 14,597  |
| 42,399 | 61,417 | 80,712 | 99,959  | 150,846 | 181,153 |
|        | 25,894 | 41,467 | 53,447  | 110,468 | 183,413 |
| 34,237 | 36,185 | 33,737 | 51,507  | 36,589  | 32,422  |
| 8,162  | -662   | 5,508  | -4,997  | 3,789   | -34,682 |

\* 10%, Footnote 1, Table 10.

\*\* Based on estimate of 81.82 Kg/ha.

\*\*\* Conversion rate 81.7, data from Table 8.

\*\*\*\* Internal usage of soybean products unknown (Have only two years of data and cannot calculate usage).



## SECTION V

### MARKET CHANNELS, PATTERNS, AND MARGINS

Some agricultural leaders in Paraguay believe that the basic agricultural marketing problem is one of an inefficient market system with excessive marketing margins. The findings of this study do not support this belief. The present section summarizes the analyses and appraisal of the current marketing system undertaken in the study.

#### Marketing Channels

As previously detailed in Computer Appendix No. 1, a large differential occurs in the geographical distribution of production, depending on whether the crop is destined for local consumption or for cash markets. The 1973 sample survey of agricultural production shows that in distribution of production by farm size, small farms produced the majority of products.<sup>1</sup> Well over 50 percent of the production of cotton, corn, tobacco, castor beans, sugar cane, and edible beans is produced on small farms.<sup>2</sup> In contrast, the greater percentages of rice and soybean production are grown on farms of over 51 hectares, such farms representing 69.9 and 65.1 percent of production, respectively. Wheat was not enumerated. The dominance of small farmer production for most crops indicates the need for an efficient local, first-handler system within the marketing channels for the agricultural commodities produced in Paraguay.

An analysis of data collected in a survey of acopiadores (first handlers) handling grains, cotton, and tobacco is summarized in Tables 16 and 17. These percentages reported were tabulated from the basic survey data collected for a study of acopiadores.<sup>3</sup> The tabulation summarizes in weighted percentages the

<sup>1</sup>Small farms defined as 0-20 hectares per farm.

<sup>2</sup>This is also the case for vegetable and root crops, including peanuts.

<sup>3</sup>El Acopio, Publication No. 2, Ministry of Agriculture and Livestock, Department of Agricultural Commerce and Economics, August, 1972.

market channels by geographic zones and by product, both in terms of incoming channels and outgoing channels of movement.

The marketing channels summarized in Tables 16 and 17 handle approximately 40 percent of the corn and 15 percent of edible beans destined for human consumption. This is as expected, since these are important subsistence crops. Most of the balances move through more direct channels into home consumption and local tradings. Some of the edible beans to supply the army move through more direct channels. The corn for animal feeds is fed on the farm or marketed by larger farm units directly to feed manufacturers.

The percentages of production of rough rice, soybeans, and wheat production marketed through these channels are substantially lower, estimated at 15, 21, and 5 percent respectively. This also is as expected, because larger fractions of rice and soybeans are produced primarily by large farm units which sell directly to processors and/or exporters. At the time of the study, virtually all wheat was marketed by farmers through channels specified by the government. The study also shows that the first-handlers market substantial percentages of cotton and tobacco production, approximately 40 and 60 percent respectively.

While the survey data should not be taken as absolute, the study does indicate the existing systems of moving agricultural commodities to market. Four distinct basic patterns of marketing channels emerge: (1) the first-handler system, moving commodities from the farm level to further distribution and processing stages, (2) the movement of commodities directly from the farm to local markets, (3) the movement of commodities from large farms to processors and/or exporters, and (4) the movement of commodities in a

TABLE 16

MARKET CHANNELS USED BY FIRST-HANDLERS  
 Summary By Zone For All Products Handled  
 (Percentage)\*

| CHANNEL               | ZONE #1** | ZONE #2 | ZONE #3 | ZONE #4 | ZONE #5 | ZONE #6 | ZONE #7 | COUNTRY |
|-----------------------|-----------|---------|---------|---------|---------|---------|---------|---------|
| MAJOR ASSEMBLER       |           | 12.1    | 0.5     | 8.3     | 3.3     |         |         | 1.2     |
| RETAIL DISTRIBUTOR    | 29.3      | 1.8     | 2.5     | 0.9     | 22.6    | 1.4     | 14.8    | 10.0    |
| WHOLESALE DISTRIBUTOR | 10.1      | 5.9     | 4.5     | 72.3    | 6.0     | 47.7    | 12.0    | 12.4    |
| FINAL CONSUMERS       | 3.5       | 35.8    | 0.2     | 7.2     | 4.3     | 0.8     | 4.4     | 2.3     |
| PROCESSORS            | 50.8      | 44.4    | 62.3    | 11.3    | 52.0    | 10.9    | 37.2    | 49.7    |
| EXPORTERS             |           |         | 1.3     |         | 11.8    | 39.2    | 15.5    | 8.3     |
| PROCESSED BY HANDLER  | 6.3       |         | 28.7    |         |         |         | 16.1    | 16.1    |
| TRUCK MERCHANT        |           |         | ***     |         |         |         |         |         |

Summary by District and Incoming Channels to Handlers

|              |      |      |      |      |       |      |      |      |
|--------------|------|------|------|------|-------|------|------|------|
| FARMERS      | 56.4 | 66.2 | 95.6 | 79.7 | 100.0 | 96.8 | 76.4 | 90.3 |
| SUB-HANDLERS | 43.6 | 33.8 | 4.4  | 20.3 |       | 3.2  | 23.6 | 9.7  |

\* Weighted by volume.

\*\* Zones divided as follows: #1 - Central Area (Central and Cordillera), #2 - Coronel Ovideo Area (Caaguazu), #3 - Southern Area (Misiones, Itapua), #4 - Caazapa Area (Caazapa and Guaira), #5 - Eastern Area (East Caazupu and Alto Parana), #6 - San Pedro Area (San Pedro and North Caazupu), #7 - Concepcion Area (Concepcion and Amambay).

\*\*\* Less than 1/10 of 1%.

TABLE 17

## MARKET CHANNELS BY FIRST-HANDLERS

Summary By Grain For All Zones

(Percentage)

| CHANNEL   | GRAIN | Corn |      |        | Rough<br>Rice | Soybeans | Edible<br>Beans | Wheat |
|---|-------|------|------|--------|---------------|----------|-----------------|-------|
|   |       | V-1  | Tupi | Blanco |               |          |                 |       |
| MAJOR ASSEMBLERS                                  |       | 1.6  | 4.5  | 1.8    |               | 0.3      | 2.8             |       |
| RETAIL DISTRIBUTORS                               |       | 24.3 | 7.9  | 26.8   |               |          | 4.1             |       |
| WHOLESALE DISTRIBUTORS                            |       | 21.0 | 51.4 | 52.1   |               | 0.1      | 54.9            |       |
| FINAL CONSUMERS                                   |       | 1.8  | 3.2  | 6.8    |               |          | 36.4            |       |
| PROCESSORS  |       | 26.0 | 47.2 | 3.3    | 29.7          | 95.0     | 0.6             | 100.0 |
| EXPORTERS   |       | 24.7 |      |        |               |          | 0.6             |       |
| PROCESSED BY HANDLER                              |       | 0.6  | 5.8  | 9.2    | 70.3          | 4.6      |                 |       |
| TRUCK MERCHANTS                                   |       |      |      |        |               |          | 0.6             |       |
| Summary By Crop And Incoming Channels To Handlers |       |      |      |        |               |          |                 |       |
| FARMERS   |       | 87.8 | 84.9 | 81.6   | 88.8          | 97.3     | 76.6            | 94.9  |
| SUB-HANDLERS                                      |       | 12.2 | 15.1 | 18.4   | 11.2          | 2.7      | 23.4            | 5.1   |

vertically integrated system, as where a rice farm and mill are operated under the same enterprise. Local farmer cooperatives are classified as first-handlers and included in the tabulations summarized above.

#### Indicated Marketing Margins

As part of the present study, a survey was conducted of 11 different firms handling and/or processing agricultural crops. These firms range in size from small cooperatives and acopiadores to large cooperatives and private firms with their own processing facilities. Data were collected by personal interview from the operators, volume records, operating statements, balance sheets and other records for the business. The sample consisted of seven cooperatives and four private firms.

The analysis is presented in Computer Appendix No. 2,<sup>1</sup> under separate cover. Base cases were constructed projecting operations of the firm as they now occur using projected volumes anticipated by the managers. Sensitivity analysis was applied to test how changes in operations would affect the rate of return on capital invested. Table 18 summarizes the results of the base cases as analyzed.

The internal rate of return on invested capital for cooperatives ranged from a -3.021 percent to 45.391 percent. Only one cooperative had a rate of return above 7 percent. This cooperative serves a German colony and has had outstanding managerial planning, direction, and control.

The internal rate of return on investment capital for private firms ranged from -0.073 percent to 35.178 percent. The data for one private firm having a rate of return over 13 percent is believed to be inaccurate. Most of the data were provided by the manager from memory rather than

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<sup>1</sup>Computer Appendix No. 2 is on file with AID/Washington and USAID/Paraguay.

from the records of the firm. The observable indicators of the level of management at this firm indicate that the true rate of returns for the environment in which it operates is no more than 15 percent.

The basic conclusion is that marketing margins are not adequate under current operational conditions, especially in the case of cooperatives. The cost of capital for marketing firms in Paraguay is calculated to be in the range of 10-12 percent; on this basis only two firms of this sample are viable firms.<sup>2</sup> Sensitivity analyses of the basic cases shows that if margins and/or volumes could be altered, the rate of return would be increased substantially. This is illustrated in Table 19. However, the results show that substantial volumes would have to be added to current volumes to achieve the same results that would be achieved by small changes in margins. This is true because handlers are operating under conditions which make variable costs high in relation to fixed costs. It was also determined that in cases where transport costs were part of the services provided by the handler, the reduction or elimination of the transport function of the firm added significantly to the rate of return. These firms are not recovering the full cost of transport in the margins between selling and buying prices and/or transport charges made to producers.

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<sup>2</sup>A viable firm is a firm which generates a return on investment above the economic alternative rate of investment. That is, a firm must generate a large enough flow of earnings to replace original capital which is deteriorating and also a return to the investors of this capital. This is true also for cooperatives.

The results of this analysis indicate that no excessive margins exist at the handler and/or processor levels studied. Operations may be made more efficient by upgrading management and therefore reducing operating costs through internal firm efficiency, but potentials for doing so are limited. As it is structured, the marketing system is quite competitive --- so much so that it may be difficult to attract equity capital and innovation into the system.

TABLE 18

BASE CASE RESULTS OF IRR ANALYSIS OF SAMPLE MARKETING OPERATIONS\*

| CASE NUMBER | TOTAL INVESTED<br>CAPITAL<br>(G \$1000) | INDICATED ANNUAL<br>RETURN ON INVESTMENT<br>BASE CASE |
|-------------|---|---|
| 1           | 16,835                                  | -2.586%   |
| 2           | 29,856                                  | 12.340%   |
| 3           | 16,514                                  | 4.305%  |
| 4           | 28,750                                  | 35.178%   |
| 5           | 9,090                                   | -0.073%   |
| 6           | 470,075                                 | 45.391%   |
| 7           | 29,369                                  | 0.137%  |
| 8           | 544                                     | 6.631%  |
| 9           | 5,923                                   | **  |
| 10          | 1,389                                   | -3.021%   |
| 11          | 28,590                                  | 1.341%  |

\* Internal rate of return on capital invested analysis

\*\* Unable to compute because data indicated losses for every year.

Source: Computer Appendix No. 2

TABLE 19

SELECTED SENSITIVITY ANALYSIS OF MARKETING OPERATIONS  
Internal Rate of Return

| ALTERNATIVE              | Case #1 | Case #2 | Case #3 | Case #7 | Case #8 |
|--------------------------|---------|---------|---------|---------|---------|
| Base Case                | -2.586  | 12.340  | 4.305   | 0.137   | 6.631   |
| +10% Increase in Margins | 17.740  | 44.641  | 29.496  | 0.467   | 25.288  |
| +25% Increase in Volume  | 3.374   | 20.140  | N/A     | 0.398   | 11.742  |

Source: Computer Appendix No. 2, on file with AID/Washington and USAID/Paraguay.

Facilities and Infrastructure

Survey reports list available grain storage capacity at 117,089 and 48,020 metric tons for bulk and bag storage, respectively. A cross-check reveals that this list does not include any warehousing facilities operated by first-handlers. Also not taken into account are recently completed storage facilities not constructed for grain but being used for grain, and storage facilities for grain products operated by food wholesalers and retailers.

While data are not available for these types of storage, the first-handler survey reveals available warehouse space (bagged storage) of slightly over 33,000 square meters being used by the handlers surveyed. Extrapolated to include all first-handlers, this indicates nearly 48,000 square meters of available warehouse storage at the first-handler level.

Given the harvest pattern illustrated in Figure 1 and a probable annual turnover ratio of 2.0, the data suggests that storage is not a constraint upon the system.<sup>1</sup> The principal storage requirements for grain are

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<sup>1</sup> Turnover rate constructed from data in the first-handler study plus constructed grain movement through other storage facilities.

soybeans, rough rice, commercial corn and wheat. Peak harvest months of these commodities do not coincide. Based upon probable turnover rate, effective storage capacity is about 375,000 metric tons. When compared to production data, this storage should be adequate. No doubt some of the existing storage capacity is not properly located and may be of the wrong size or type. The storage survey indicated unused capacity of 31,823 and 940 metric tons of bulk and bagged storage, respectively. This may be due, in part, to improper location and design of facilities and failure of storage units to function as a system within the context of the described marketing channels. With all factors considered, the lack of adequate overall storage capacity does not appear to be a major restriction in Paraguay's marketing system for storable agricultural commodities.

The logistics of domestic transport of agricultural production is based primarily upon road transport. Over three-quarters of all merchandise within the country moves by truck. River transport accounts for approximately 85 percent of the movement of Paraguay's foreign trade. The principal limitation is lack of adequate depth of channel which impedes transport during periods of low water flow.

While Paraguay's road system has increased from 1,346 miles in 1960 to 4,144 miles in 1973, paved roads account for only slightly over 500 miles. The balance of the road system, being dirt, precludes intensive use during wet periods. However, given the sparsely populated nature of Paraguay, much of the solution lies in proper equipment use and product flow management. While an increase in all-weather roads would be desirable, many areas cannot economically justify the investment in all-weather roads at this time.

Vehicle transport is reported to be growing at a rate of 8 to 19 percent annually. Transport charges have increased with the increases in fuel costs, but trucking services are competitive. Transport charges are relatively low considering the condition of the roads and costs faced by transport agencies.

#### Comparative Price Levels

Analysis of comparative prices is most helpful in understanding and evaluating the performance of the existing marketing system. Tables 20 and 21 illustrate world market prices for soybeans and corn "backed down" through marketing costs and margins to the farm level.

In the soybean table (Table 20), one can quickly realize that farm level prices in Paraguay are quite comparable to world prices. Also, this construction uses minimum marketing margins and some additional costs could not be computed (such as ocean insurance costs, losses and shrinkage at export terminals, etc). The only serious differential that exists (Items 7 and 8) is in 1972-73. An analysis of world prices versus farm prices, by month, over that time period indicates that farm prices lagged rapidly rising world prices. This is a normal situation and will result in a difference in averages during periods of rapid price change.

The corn table (Table 21) illustrates the export marketing problem concerning corn. Until recently, world prices for corn would not allow considerations of large quantities of corn to be exported. The domestic market for corn apparently was strong enough to support a greater price than could be achieved in world markets. Although this differential has closed, future local demand and production will determine whether Paraguay can compete in world corn markets. Over the next several years it is probable that domestic markets will be more attractive.

TABLE 20

PRICE AND MARGIN APPRAISAL FOR SOYBEANS  
Export Marketing  
U. S. #2 Grade

| MARKET LEVEL   | YEAR                  |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|  | 1970-71               | 1971-72               | 1972-73               | 1973-74               | 1974-75               |
| 1. Price, CIF<br>Rotterdam, M.T. <sup>1</sup>  | \$122.50              | \$130.58              | \$224.42              | \$262.83              | \$265.91              |
| 2. Ocean freight<br>Costs, M.T. <sup>2</sup>   | \$ 10.22              | \$ 6.15               | \$ 12.67              | \$ 27.25              | \$ 20.25              |
| 3. Transport Costs<br>Paraguay-B.A., M.T. <sup>2</sup>                                 | \$ 9.26               | \$ 9.76               | \$ 10.81              | \$ 12.03              | \$ 15.03              |
| 4. Average Local Export<br>Costs <sup>3</sup>  | \$ 20.34              | \$ 21.46              | \$ 23.75              | \$ 25.18              | \$ 33.03              |
| 5. Net Export price<br>level, M.T. <sup>4</sup>  | \$ 82.68<br>G\$10,418 | \$ 93.21<br>G\$11,744 | \$177.19<br>G\$22,326 | \$198.37<br>G\$24,995 | \$197.60<br>G\$24,898 |
| 6. Minimum Marketing<br>margin production<br>level to export<br>point, Kg <sup>5</sup> | G\$ 3.0               |
| 7. Maximum farm<br>price level, Kg <sup>6</sup>  | G\$ 7.4               | G\$ 8.7               | G\$19.3               | G\$21.9               | G\$21.9               |
| 8. Average actual farm<br>prices: Soybeans<br>all grades, Kg <sup>7</sup>              | G\$ 7.8               | G\$ 9.2               | G\$15.9               | G\$22.8               | G\$19.7               |

Footnotes end of Table 21.

TABLE 21

PRICE AND MARGIN APPRAISAL FOR CORN  
Export Market  
Argentine Grade

| MARKET LEVEL  | YEAR                |                       |                       |
|---|---------------------|-----------------------|-----------------------|
|   | 1972-73             | 1973-74               | 1974-75               |
| 1. Price, CIF<br>Rotterdam, M.T. <sup>1</sup>   | \$81.41             | \$146.00              | \$160.50              |
| 2. Ocean freight<br>Costo, M.T. <sup>2</sup>  | \$12.67             | \$ 27.25              | \$ 20.25              |
| 3. Transport costs<br>Paraguay-B.A., M.T. <sup>2</sup>                                  | \$10.81             | \$ 12.03              | \$ 15.03              |
| 4. Average Local Export<br>Costs, M.T. <sup>3</sup>                                     | \$14.82             | \$ 15.71              | \$ 20.61              |
| 5. Net Export price<br>level, M.T. <sup>4</sup>   | \$43.11<br>G\$5,432 | \$ 91.01<br>G\$11,467 | \$104.61<br>G\$13,181 |
| 6. Minimum Marketing<br>margin, production<br>level to export<br>point, Kg <sup>5</sup> | G\$ 2.8             | G\$ 2.8               | G\$ 2.8               |
| 7. Maximum Farm<br>price level, Kg <sup>6</sup>   | G\$ 2.6             | G\$ 8.7               | G\$10.4               |
| 8. Average actual farm<br>prices V-1 corn, all<br>grades, Kg <sup>7</sup>               | G\$ 7.2             | G\$10.7               | G\$10.6               |

<sup>1</sup>F.A.T.U.S., ERS, USDA

<sup>2</sup>Appendix B, no insurance or demurrage costs included.

<sup>3</sup>Based upon 1972 levels, Source "Soja, Comercializacion Nacional y Mundial", by MAG. Portioned to years by CPI. The costs include gravámenes, tasas, estiba en Asunción, storage, labor, administration, financing, plus \$225 per M.T. return on sales (one percent of monetary sales volume is considered extremely low by business standards). No losses or shrinkage included. Gravámenes excluded for corn.

<sup>4</sup>Item 1 minus Items 2, 3, and 4. Exchange Rate G\$126 = \$1.00

<sup>5</sup>Marketing margins constructed from sample survey data of cooperative and private firms. Selected from 4 firms having available data representing rates of return from below zero to acceptable levels. Weighted average constructed to include losses and shrinkage.

<sup>6</sup>Item 5 minus Item 6.

<sup>7</sup>Bulletins #73 through 88, Boletín Informativo, M.A.G.

Budgeted 1975-1976 production costs for soybeans range from G\$10.15 to G\$19.60 per kilogram depending upon location and farming system.<sup>1</sup> Weighted average cost is G\$14.29 based upon estimated yields. At the reported farm prices for October 1975 of G\$18 per kilogram, the efficient soybean farmers in Paraguay were earning a reasonable return to land and management. Paraguay's producers are wholly dependent on world markets and world prices for soybeans, however, their returns fluctuate greatly with changing world prices.

The calculated farmers' shares of the market prices for soybeans, cotton, rice, corn, wheat flour, potatoes, onions and tomatoes, confirm the absence of excess margins and profits in Paraguay's marketing system (Table 22). This illustrates several trends. The farmer's share of the end product market price has increased over time throughout the period of rising market prices. This increase means that the system, as it exists, is operating efficiently reflecting the price increases back to producers. The absolute values of the margins shown in Table 22 also attest to the relatively low marketing margins in Paraguay. The differences among the commodities reflect differences in marketing processing and transport costs and compare favorably with relative marketing margins in the United States and other developed countries.

Farm and consumer market prices, when deflated by the Consumer Price Index, have rather flat trend lines. Real prices have been stable and when projected tend to retain this stability over time.

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<sup>1</sup> Banco Nacional de Fomento, Costo Total de Production 1975/76.

More in-depth study of the marketing system may reveal needs and opportunities not shown by the overall analysis made in this study. In-depth analysis will require more complete and precise data, however, and gives further emphasis to the recommendations for the additional market statistics and analysis made earlier in this section.

TABLE 22  
CALCULATED FARMERS' SHARE OF THE MARKET PRICE  
(Percentage)

| PRODUCT PRICE              | AVERAGE PER CALENDAR YEAR |      |      |      |      |       |
|----------------------------|---------------------------|------|------|------|------|-------|
|                            | 1970                      | 1971 | 1972 | 1973 | 1974 | 1975  |
| World Soybean <sup>1</sup> | 50.9                      | 53.5 | 62.4 | 60.2 | 57.3 | 64.9  |
| World Cotton <sup>2</sup>  | 50.9                      | 56.2 | 64.7 | 38.4 | 61.1 | 53.5  |
| Local Rice <sup>3</sup>    | 44.0                      | 44.0 | 54.6 | 56.3 | 63.9 | 55.9  |
| Local Blanco Corn          | 50.0                      | 45.5 | 50.0 | 50.0 | 57.7 | 71.4  |
| Local Wheat Flour          | 54.3                      | 59.8 | 60.8 | 50.9 | 58.5 | 76.5* |
| Local Potatoes             | 84.6                      | 90.9 | 56.3 | 55.8 | 62.2 | 84.0  |
| Local Onions               | 63.6                      | N/A  | N/A  | 72.1 | 72.3 | 72.0  |
| Local Tomatoes             | 88.0                      | 87.0 | 79.3 | 82.9 | 87.2 | 88.3  |

<sup>1</sup>CIF Rotterdam prices for U.S. #2 grade

<sup>2</sup>CIF Rotterdam prices for U.S. SM1 1/10 grade compared to average price #1 cotton.  
In cotton fibre equivalent - ginning rate of 31.8 percent fibre

<sup>3</sup>Milling conversion rate of .65

<sup>4</sup>Milling conversion rate of .76

\*Government program

Sources: F.A.T.U.S., ERS, USDA  
Bulletins 73 - 88, Boletín Informativo, M.A.G.

PART THREE

PROJECTIONS OF FUTURE PATTERNS

## SECTION VI

### PROJECTIONS OF PRODUCTION POTENTIALS

Potentials for increasing agricultural production over the next 10 years depend upon (1) the continued influence of the same kind of factors which have caused increases in the past, (2) the availability of adequate markets for increased production, and (3) the effectiveness of needed supporting programs.

#### Methodology

The basic analytical procedure in determining future production potentials is the projection of past trends in production data, or in the component parts of production data. The projections were generated by the "Master Projection" computer program. This program is designed to fit mathematical regression trends to historical time series data and develop projections by extending the fitted trends. The projections which may be specified in the program include: (1) linear, (2) exponential, (3) logarithmic, (4) specified percentage rate, and (5) given coefficients (as developed from previous studies). The computer program handles both simple and multiple regression techniques. It has the capability of fitting the projections for component parts, e.g., departments, so that they sum to the projections for the whole, e.g., country.

Exponents can be any number, but exponents in the range from 0.1 to 2.0 have the most relevance for normal time series projections. The exponent of 1.0 is linear and the exponent of 2.0 is quadratic.

An important advantage of the exponential model in the Master Projection program is that complete projections can be fitted to a given set of historical data for a series of alternative exponents in the same computer run. This

permits comparison of the projected values and the statistical parameters before selection of the final projection model.

Judgement must be exercised in selecting the most realistic exponential model from the alternatives. In making projections, the alternative that yields the highest  $R^2$  value normally will be selected. However, if there are physical, biological, managerial, market, or other limits to continued expansion of production at the average historical rate, the alternative providing the best statistical fit may not yield realistic projections. In any case, a more effective judgement usually can be made after seeing the results obtained with alternative exponential projections.

The proration feature of the master projection program may be used to develop the projections of individual departments within the country. This feature fits the mathematical trends to the historical data for each department relative to the trend of the projection for the country. This procedure insures that the sum of the projections for the individual departments will equal the projections for the country. At the same time it reflects differential growth by department through the projection period.

Crop production data consists of two components, areas harvested and yield per unit area. Consequently, there are two approaches to projecting production potentials of crops.

1. Harvested area projections determine the trend in land use.

Yield per unit area projections determine the trend of yields, reflecting technological and managerial improvements. These two projections may be multiplied to determine the production potential of a given crop.

2. The production projection may be constructed from a historical time series of production data.

The type of approach depends upon the projection results for the data in question. In this study, both approaches were used.

#### Projected Production Potentials

The time series analyzed for use in projecting production potentials is detailed in Table 23. The projections of crops, livestock numbers and livestock products were constructed through 1985.

Developing final projections of production by department involved three groups of steps: (1) developing trends and "raw" projections and analysis of same, (2) selecting national production trends and prorating departmental production to national production, and (3) adjustment for final projections.

The first group of procedural steps in the projection of production potentials were as follows:

1. Raw projections of production data, national and by department at exponential range of 0.4 to 1.4.
2. Raw projections of harvested hectarage data, national and by department at exponential range of 0.4 to 1.4.
3. Raw projections of yield per hectare data, national and by department at exponential range of 0.4 to 1.4.
4. Analysis of raw projection results.

An example of all the procedural steps is included in Appendix A.

The analysis of the raw projections of harvested hectares and yield per hectare for eight crops revealed that while definite trends existed for harvested hectares, yield per hectare had flat trend lines.<sup>1</sup> The R-Square values for the yield per hectare trends at the department level were very low,

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<sup>1</sup>Eight crops include sugar cane, cotton, edible beans, tobacco, corn, wheat, rice, and soybeans.

TABLE 23  
AVAILABLE DATA ON AGRICULTURAL PRODUCTION OF SELECTED CROPS  
AND LIVESTOCK

| Crop/Livestock           | National<br>Data | Departmental<br>Data |
|--------------------------|------------------|----------------------|
| Sugar Cane               | 1962-1974        | 1962-1974            |
| Sugar Cane for syrup     | 1970-1974        | 1970-1974            |
| Sugar Cane for Sugar     | 1970-1974        | 1970-1974            |
| Wheat                    | 1962-1974        | 1962-1974            |
| Corn                     | 1962-1974        | 1962-1974            |
| All Rough Rice           | 1962-1974        | 1962-1974            |
| Irrigated Rough Rice     | 1971-1974        | 1971-1974            |
| Non-irrigated Rough Rice | 1971-1974        | 1971-1974            |
| Cotton                   | 1962-1974        | 1962-1974            |
| Edible beans             | 1962-1974        | 1962-1974            |
| Tobacco                  | 1962-1974        | 1962-1974            |
| Soybeans                 | 1962-1974        | 1970-1974            |
| Grain Sorghum            | 1973-1974        | 1973-1974            |
| Hogs, Number of Head     | 1962-1974        | 1970-1974            |
| Chickens, Number of head | 1970-1974        | 1970-1974            |
| Milk                     | 1962-1974        | N/A                  |
| Eggs                     | 1962-1974        | N/A                  |

with only 9 out of 112 highest R-Square exponential fits analyzed having R-Square values with significance greater than the .05 level.<sup>1</sup> These results are due to either yields being stable or extreme fluctuation of yields over the historical time series. An inspection of the data reveals that in the majority of cases, the major problem is one of extreme yield variation from year to year.

Because of this problem, it was concluded that the appropriate projecting hectareage and yields to determine production potentials was not feasible.

The second group of procedural steps in the projection of production potentials were as follows.

1. Selection of national production projection by specific crop or livestock product that had a best-fit trend line as indicated by R-Square and SYX values.
2. Selection of differential crop production projections and departmental production projections by specific crop or livestock product that had a best-fit trend line as indicated by R-Square and SYX values.<sup>2</sup>

The models selected for trend projections were as described in Table 24. In most of those not statistically significant, the b- value was low, so that the R-Square value tends to be low. The output tables for the preliminary national production projections are compiled in Computer Appendix 1, on file with AID/Washington and USAID/Paraguay.

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<sup>1</sup>Trends analyzed for national and departmental data of production, harvested hectares, and yields per hectare. The R-Square values for departmental production and harvested hectares were substantially higher, with 37 and 29 of 112 trends respectively analyzed having a R-Square value with significance greater than the .05 level.

<sup>2</sup>For sugar cane, the production was differentiated between production for sugar and production for syrup. For rough rice, the production was differentiated between irrigated and non-irrigated production.

TABLE 24

SUMMARY OF MODELS SELECTED FOR NATIONAL PRODUCTION PROJECTIONS

| Crop/Livestock product            | Exponential<br>value selected | R <sup>2</sup> value |
|-----------------------------------|-------------------------------|----------------------|
| Sugar Cane for Sugar and<br>Syrup | 0.4                           | .4457                |
| Cotton                            | 1.4                           | .4247                |
| Edible beans                      | 1.4                           | .4302                |
| Tobacco                           | 1.4                           | .4069                |
| Corn                              | 1.4                           | .6171*               |
| Wheat                             | 0.4                           | .4645                |
| Rough Rice                        | 1.4                           | .8147*               |
| Soybeans                          | 1.4                           | .8322*               |
| Grain Sorghum **                  | 1.4                           | .7353*               |
| Hogs (number of head)             | 1.4                           | .7535*               |
| Chickens (number of head)         | 0.4                           | .9503*               |
| Milk                              | 1.4                           | .7610*               |
| Eggs                              | 1.4                           | .7610*               |

\*Statistically Significant at the .05 level.

\*\* Grain Sorghum projected at a given percentage rate of increase. This rate is based upon production growth rate of corn.

### Adjusted Final Projections

The third group of steps involving the final production projections are as follows:

1. Adjustment of national preliminary production projections.
2. Proration of production by product use, in the case of sugar cane, and by production techniques, in the case of rough rice, to national aggregate production.<sup>1</sup>
3. Proration of raw departmental production projections to national production projections or product differentiation projections (rice and sugar cane) with imposed limits.

The preliminary projections of production of crops (Computer Appendix 1) were adjusted by adding the difference between 1975 projected production and the estimates of 1975 production provided by the Ministry of Agriculture. These estimates were provided on a national level for corn, rice, cotton, and soybeans. There were no production estimates for wheat, edible beans, tobacco, or sugar cane. This differential was applied to the projection years 1975 through 1985. These output tables are in Computer Appendix 1, on file with AID/Washington and USAID/Paraguav.

The selection of raw departmental production projection models for proration is described in Table 25. In a few cases the historical trend of production was downward at a rate sufficient to make projections reach zero production in a department. In those cases, the "raw" projections were leveled at a constant value equal to the historical (or projected) value for a specific year. Such lower limits were applied and are listed in

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<sup>1</sup> For sugar cane, the production was differentiated between production for sugar and production for syrup. For rough rice, the production was differentiated between irrigated and non-irrigated production.

TABLE 25  
SUMMARY OF SELECTION OF DEPARTMENTAL PRODUCTION PROJECTION MODELS  
FOR PRORATION

| Crop                     | Exponential Value Selected | Number of Significant R <sup>2</sup> values at .05 level | Limits imposed by Department upper | lower*  |
|--------------------------|----------------------------|--|------------------------------------|---|
| Sugar Cane for Sugar     | 0.4                        | 6  | none                               | Gaaguazu, Paraguari, Central, Chaco               |
| Sugar Cane for Syrup     | 0.4                        | 6  | none                               | Concepcion, Guaira, Gaaguazu, Itapua, Misiones    |
| Cotton                   | 1.4                        | 3  | none                               | Central   |
| Edible beans             | 1.4                        | 3  | none                               | none  |
| Tobacco                  | 1.4                        | 3  | none                               | Itapua, Central, Misiones, Neembucu, Amambay      |
| Corn                     | 1.4                        | 2  | none                               | Central, Chaco                                    |
| Wheat                    | 0.8                        | 1  | none                               | Gaazapa, Neembucu                                 |
| Irrigated Rough Rice     | 1.4                        | 6  | none                               | Concepcion, San Pedro, Guaira Cordillera, Gaazapa |
| Non-irrigated Rough Rice | 1.4                        | 6  | none                               | Concepcion, San Pedro, Guaira                     |
| Soybeans                 | 1.4                        | 8  | none                               | none  |
| Grain Sorghum**          |                            |  |                                    |   |

\*leveled at 1975 year

\*\* Only two years of data available. These data years used directly in proration of production by department.

Table 25. There were no cases where projected production had "exploded" to an unrealistically large number; therefore, no upper limits had to be applied. The final production projections by product differentiation and department are listed in Computer Appendix 1.<sup>1</sup>

Final livestock numbers and livestock product national projections were made as previously described. Proration and projection of department livestock numbers were made without any "raw" projections of departmental data. The limited data involved does not allow any significant projection of production because of the lack of production data for hogs and poultry and the lack of department level data for eggs and milk.

#### Projected Harvested Hectarage

In the analysis of production data, it is readily apparent that past increases in production are more a result of increased hectares planted to a crop, rather than to increases in yield per hectare. To test the validity of the production projections, a series of projections of harvested hectares was constructed. The same procedure as previously described in this section for production was followed for projecting harvested hectares. The results of this projection are detailed in Computer Appendix 1 of final computer output tables.<sup>1</sup>

The results of this hectare projection have a level of minimum yields required to achieve the level of national production projected. These levels are shown in Table 26. Given volatility and lack of substantial upward trend in yields, these minimum yield levels appear to be realistic. Two exceptions may be rice and soybeans.

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<sup>1</sup>This appendix of computer output tables is on file with AID/Washington and USAID/Paraguay.

TABLE 26  
COMPARISON OF ACTUAL YIELDS VERSUS YIELD LEVELS  
REQUIRED TO ACHIEVE PRODUCTION PROJECTIONS<sup>1</sup>  
Kg/Ha

| Crop                    | Actual<br>1974 | Required Yield Levels |       |
|-------------------------|----------------|-----------------------|-------|
|                         |                | 1975                  | 1985  |
| Sugar Cane for<br>Sugar | 44220          | 40620                 | 43770 |
| Cotton                  | 962            | 1000                  | 1190  |
| Wheat                   | 1163           | 930                   | 830   |
| Corn                    | 1366           | 1200                  | 1360  |
| Edible Beans            | 771            | 680                   | 650   |
| Tobacco                 | 1341           | 1300                  | 1340  |
| Soybeans                | 1424           | 1450                  | 830   |
| Irrigated Rice          | 2401           | 2130                  | 1520  |
| Grain Sorghum           | 1305           | 1310                  | 1350  |

<sup>1</sup>National level, based upon projections of historical trend in crop hectares.

## SECTION VII

### FUTURE DOMESTIC MARKET POTENTIALS

Rather than production constraints the major constraint facing Paraguay, as an agricultural producer, is one of adequate markets. Before productivity in agriculture can be transferred to those who work in agriculture, adequate markets must exist for the utilization of this productivity. A review of Gross National Product based on constant money terms, 1962 through 1972, reveals that average per capita agricultural GNP for employed workers has increased slightly over 1 percent for this period. This is in comparison to slightly over 33 percent increase for average per capita non-agricultural GNP for employed workers over the same time period. However, further review of 1973 and 1974 indicate that during these 2 years the percentage increase in per capita GNP for the agricultural and non-agricultural sector has almost equalized. This response is due to worldwide increase in demand for food and fibre products. Market volume of demand and price increases created a supply response in agricultural productivity.

The key factors for volume of domestic demand for food products in any given year are total population and average per capita consumption. Average per capita consumption is affected by eating habits and food preferences, by average income levels, and by the price of one food group relative to prices of complementary or substitute food groups. Rural populations generally have different eating habits than urban populations so that the average per capita consumption is different among the two populations. As income increases, different shifts in the consumption level of food groups occur. The magnitude of these shifts depends on the income elasticity of demand as well as the price elasticity of demand for the particular food group.

Income elasticity measures the percentage increase or decrease in consumption with a given percentage increase in income. Price elasticity measures the percentage decrease in consumption with a given increase in price.

In this case, elasticities cannot be constructed because of lack of adequate data on per capita consumption. Without more detailed consumption data, any demand equations constructed could not be relied upon to yield accurate results.

A preliminary analysis of the relationship between demand for selected products and factors influencing demand was undertaken. The factors investigated were real per capita income, population, and real consumer market prices. Products analyzed were wheat product consumption, flour milled, rice consumption, and corn product consumption.

This analysis indicated highly volatile income and price elasticities. The income elasticities obtained ranged from  $-.169$  to  $2.038$ , while price elasticities ranged from  $-.138$  to  $2.594$ . The volatility of the demand elasticities obtained within the same product class (i.e., food grain products) is apparently due to inadequate and imprecise data. Therefore, no rigorous economic analysis could be performed as basis for construction of consumption demand equations.

This set of circumstances dictated that another system be devised for construction of future domestic consumption. The trends of per capita consumption, real per capita income, and real prices were analyzed for the four product groups. Raw correlations coefficients of trends were derived, the results of which indicated that the trends in per capita consumption

were highly related to real per capita income, while having little relationship to real product price.<sup>1</sup>

Based on these results, basic assumptions can be stated underlying the construction of future domestic consumption as made herein. These assumptions are as follows:

1. That real price movement affect rates of consumption by small shifts in consumption among substitute and complementary foods and that this pattern of shift is stable and will not change.
2. That the increase or decrease in per capita consumption of all food groups is significantly correlated to real per capita income, and that projected trends of real per capita income having a significant statistical value indicate reliable trends in per capita consumption.

Based on these assumptions, projections for volume of demand of food becomes a function of the projected population times the projected average per capita consumption.

The method used for constructing domestic consumption is as discussed in Section VI. The procedure is as follows:

1. Projection of real average per capita consumption to test assumption number two.
2. Projection of per capita consumption of food product groups.
3. Projection of population by national and departmental levels.
4. Projection of volume of national consumption by food product group based on per capita consumption and population projections.
5. Proration of projected national consumption volume to national urban and rural consumption.
6. Proration of national urban and rural projected consumption by department based on urban and rural projections of population by department.

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<sup>1</sup>Correlation of trends in per capita consumption to trends in real income and real price resulted in raw correlation coefficients of greater significance for per capita consumption correlated to real income.

7. Adjustment of urban and rural projected consumption by department to reflect geographical differences between departments.<sup>1</sup>

#### Projected Per Capita Income and Per Capita Consumption

Average real per capita incomes have been increasing each year with the progress of economic development in Paraguay. Unfortunately, data are not available on the distribution of income by department nor in the differential rates of growth in either urban or rural populations or from one department to another.

In the absence of the data, it has been necessary to reflect income effects on a national basis only and to ignore these effects in the changing geographic patterns of demand. The projection of per capita income is detailed in Computer Appendix No. 3. The R-square value of this trend projection is statistically significant at the .01 level. Therefore, primary assumption number two is considered to be valid. To the extent that average per capita incomes may be increasing somewhat more rapidly in the capital city than in the departments, the demand patterns may be shifting even more rapidly than shown in the demand projections in this study.

The projection of per capita consumption by food product group is listed in Table 27. The statistical results of all trend projections were significant at the .01 level. An adjustment was made to projected per capita consumption of corn products because the 1975-1985 rates became unrealistically large. Therefore, corn products projections were leveled at the 1972 consumption rate. It is unknown where the data error lies; it could occur in either

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<sup>1</sup>The geographical differences between departments in consumption rates are based on the 1965 nutrition survey data. Undoubtedly, the differences in rates of consumption, urban versus rural and geographical, have changed over time. But with no other data, the ratios must be held constant over time.

TABLE 27  
 PROJECTION OF PER CAPITA CONSUMPTION BY FOOD PRODUCT GROUP  
 BASED ON 1965 AND 1972 DATA

| GRAMS PER YEAR |                   |       |                  |        |            |        |        |       |       |       |                   |                |       |
|----------------|-------------------|-------|------------------|--------|------------|--------|--------|-------|-------|-------|-------------------|----------------|-------|
| YEAR           | WHEAT<br>PRODUCTS | RICE  | CORN<br>PRODUCTS | TUBERS | VEGETABLES | FRUITS | SUGAR  | BEANS | MEATS | EGGS  | DAIRY<br>PRODUCTS | OILS<br>& FATS |       |
| 1965           | 0                 | 37950 | 13140            | 10500  | 192720     | 16430  | 104390 | 11320 | 8760  | 46720 | 4380              | 32490          | 7670  |
| 1966           | 0                 | 37631 | 13339            | 11748  | 189772     | 17536  | 106126 | 11513 | 8861  | 47274 | 4651              | 34697          | 7950  |
| 1967           | 0                 | 37314 | 13542            | 13033  | 186870     | 18716  | 107892 | 11769 | 8963  | 47835 | 4939              | 37054          | 8241  |
| 1968           | 0                 | 37000 | 13747            | 14459  | 184012     | 19875  | 109587 | 11924 | 9066  | 48402 | 5245              | 39571          | 8542  |
| 1969           | 0                 | 36689 | 13955            | 16040  | 181197     | 21320  | 111512 | 12133 | 9170  | 48976 | 5570              | 42259          | 8854  |
| 1970           | 0                 | 36300 | 14167            | 17795  | 179426     | 22754  | 113367 | 12345 | 9225  | 49557 | 5915              | 45130          | 9177  |
| 1971           | 0                 | 36074 | 14362            | 19741  | 175697     | 24286  | 115253 | 12550 | 9352  | 50145 | 6281              | 43156          | 9512  |
| 1972           | 0                 | 35770 | 14600            | 21900  | 173010     | 25920  | 117170 | 12780 | 9490  | 50740 | 6570              | 51470          | 9860  |
| 1973           | 0                 | 35447 | 14882            | 21900  | 170365     | 27655  | 119117 | 13001 | 9534  | 51341 | 7030              | 54967          | 10220 |
| 1974           | 0                 | 35146 | 15046            | 21900  | 167760     | 29517  | 121099 | 13227 | 9692  | 51949 | 7451              | 56701          | 10593 |
| 1975           | 0                 | 34848 | 15275            | 21900  | 165194     | 31506  | 123113 | 13456 | 9802  | 52565 | 7908              | 62688          | 10960 |
| 1976           | 0                 | 34552 | 15506            | 21900  | 162663     | 33528  | 125161 | 13689 | 9913  | 53189 | 8387              | 68647          | 11331 |
| 1977           | 0                 | 34258 | 15742            | 21900  | 160181     | 35894  | 127243 | 13926 | 10025 | 53819 | 8895              | 71495          | 11797 |
| 1978           | 0                 | 33967 | 15980            | 21900  | 157731     | 38311  | 129359 | 14157 | 10138 | 54458 | 9434              | 76352          | 12228 |
| 1979           | 0                 | 33679 | 16223            | 21900  | 155319     | 40892  | 131511 | 14413 | 10253 | 55103 | 10006             | 81539          | 12675 |
| 1980           | 0                 | 33393 | 16469            | 21900  | 152544     | 43647  | 133699 | 14662 | 10368 | 55757 | 10612             | 87078          | 13138 |
| 1981           | 0                 | 33109 | 16719            | 21900  | 150605     | 46587  | 135923 | 14916 | 10486 | 56418 | 11255             | 92994          | 13618 |
| 1982           | 0                 | 32828 | 16972            | 21900  | 148302     | 49725  | 138184 | 15175 | 10604 | 57087 | 11937             | 99311          | 14115 |
| 1983           | 0                 | 32550 | 17230            | 21900  | 146035     | 53075  | 140482 | 15438 | 10724 | 57764 | 12661             | 106058         | 14631 |
| 1984           | 0                 | 32273 | 17491            | 21900  | 143802     | 56650  | 142819 | 15705 | 10845 | 58449 | 13428             | 113253         | 15165 |
| 1985           | 0                 | 31999 | 17756            | 21900  | 141603     | 60466  | 145194 | 15977 | 10968 | 59142 | 14241             | 120957         | 15719 |

SOURCE:

TABLE 6  
 CORN PRODUCTS ADJUSTED TO 1972 LEVELS, 12.65 KG/URBAN, 27.43 KG/RURAL

the data on production or utilization of this product. It is also believed that the demand for dairy products may be unrealistically high given a predominantly rural population. However, there is no way to construct an upper limit due to the lack of adequate data.

#### Projected Population

Population projections for Paraguay are listed in Table 28, 1972 through 1985 based upon annual projected growth rates made by the Bureau of the Census. Separate projections have been made for rural and urban populations by department. The projections by department are shown in Table 29. They are based on the national population growth as per Table 28, but reflect the differences in the rates of growth by department and among urban and rural populations.

The changes in existing population patterns which will take place are reflected in this table. The rural population represented 62.58 percent of the total in 1972; this percentage will be reduced to only 59.74 percent in 1985. The population of Asuncion represented 16.50 and 44.08 percent of the total population and urban populations, respectively, in 1972. The percentage will be reduced to 15.17 and 37.69, respectively, in 1985.

The results indicate, given the same underlying factors of the past, that Paraguay will still retain its rural characteristics and orientation. The disproportionate smaller growth in the only large metropolitan city is balanced by urban growth near the city as illustrated in the urban growth pattern of Central Department.

The implication of these projections is that the population patterns will be dominantly rural with one large metropolitan complex market. The

TABLE 28  
 NATIONAL POPULATION PROJECTION: 1972-1985 BASED ON 1972 CENSUS  
 PERCENTAGE INCREASE BASED ON PROJECTIONS AS PER FOOTNOTE

| YEAR |   | POPULATION |
|------|---|------------|
| 1972 | 0 | 2357455    |
| 1973 | 0 | 2424919    |
| 1974 | 0 | 2494513    |
| 1975 | 0 | 2566852    |
| 1976 | 0 | 2642060    |
|      |   |            |
| 1977 | 0 | 2719798    |
| 1978 | 0 | 2800507    |
| 1979 | 0 | 2883690    |
| 1980 | 0 | 2969323    |
| 1981 | 0 | 3057509    |
|      |   |            |
| 1982 | 0 | 3148033    |
| 1983 | 0 | 3240871    |
| 1984 | 0 | 3335827    |
| 1985 | 0 | 3432817    |

SOURCE: PROYECCIONES DE POBLACION POR SEXO Y GRUPOS DE EDAD 1950-2000, DIVISION DE PROGRAMACION SOCIAL SECTOR POBLACION Y RECURSOS HUMANOS, DICIEMBRE 1974

TABLE 29  
POPULATION PROJECTIONS 1972-1985  
RURAL AND URBAN, BY DEPARTMENT

| YEAR | (R) CONCEPCION (U) | (R) SAN PEDRO (U) | (R) CORDILERA (U) | (R) GUIRA (U) | (R) GAAGUAZU (U) |       |       |       |        |       |
|------|--------------------|-------------------|-------------------|---------------|------------------|-------|-------|-------|--------|-------|
| 1972 | 76754              | 31376             | 117318            | 21000         | 157305           | 36913 | 88447 | 36352 | 177643 | 33215 |
| 1973 | 79261              | 31715             | 122034            | 21462         | 159215           | 37474 | 89425 | 36972 | 186182 | 34790 |
| 1974 | 81598              | 31867             | 127459            | 21826         | 158154           | 37824 | 89836 | 37396 | 195729 | 36516 |
| 1975 | 83953              | 32003             | 132990            | 22184         | 157999           | 39154 | 90194 | 37803 | 205643 | 38305 |
| 1976 | 86320              | 32116             | 138670            | 22532         | 157741           | 38461 | 90495 | 38188 | 215917 | 40156 |
| 1977 | 88690              | 32204             | 144474            | 22866         | 157353           | 39739 | 90721 | 38546 | 226517 | 42060 |
| 1978 | 91013              | 32261             | 150368            | 23183         | 156808           | 38980 | 90856 | 38667 | 237397 | 44010 |
| 1979 | 93334              | 32230             | 156332            | 23478         | 156093           | 39179 | 90893 | 39149 | 243528 | 46001 |
| 1980 | 95530              | 32258             | 162321            | 23745         | 155180           | 39328 | 90811 | 39381 | 259844 | 48019 |
| 1981 | 97671              | 32192             | 168302            | 23982         | 154055           | 39422 | 90600 | 39560 | 271291 | 50055 |
| 1982 | 99696              | 32073             | 174219            | 24182         | 152633           | 39452 | 90244 | 39673 | 282781 | 52092 |
| 1983 | 101583             | 31897             | 180024            | 24341         | 151065           | 39412 | 89728 | 39717 | 294233 | 54117 |
| 1984 | 103295             | 31658             | 185643            | 24450         | 149156           | 39292 | 89035 | 39680 | 305527 | 56105 |
| 1985 | 104805             | 31351             | 191016            | 24505         | 146945           | 39035 | 88152 | 39555 | 316554 | 58038 |

SOURCE:

CENSO NACIONAL DE POBLACION Y VIVIENDAS, 1962 Y 1972, DIRECCION GENERAL DE ESTADISTICA CENSOS (R=RURAL, U=URBANA)

TABLE 29  
POPULATION PROJECTIONS 1972-1985  
RURAL AND URBAN, BY DEPARTMENT

| YEAR | (R) GAAZAPA (U) | (R) ITAPUA (U) | (R) MISIONES (U) | (R) PARAGUARI (U) | (R) ALTO PARANA (U) |       |        |       |        |        |
|------|-----------------|----------------|------------------|-------------------|---------------------|-------|--------|-------|--------|--------|
| 1972 | 88251           | 14388          | 156753           | 44658             | 47162               | 22084 | 179473 | 32498 | 72408  | 15199  |
| 1973 | 84892           | 14963          | 162375           | 45350             | 48107               | 22439 | 181469 | 32393 | 75090  | 17398  |
| 1974 | 91025           | 14741          | 167944           | 45767             | 49824               | 22683 | 182381 | 32083 | 87450  | 21244  |
| 1975 | 92119           | 14613          | 173577           | 46161             | 49520               | 22916 | 183187 | 31757 | 97885  | 25924  |
| 1976 | 93165           | 14476          | 179285           | 46527             | 50193               | 23136 | 183875 | 31412 | 109495 | 31616  |
| 1977 | 94144           | 14329          | 185074           | 46858             | 50834               | 23340 | 184414 | 31046 | 122340 | 38525  |
| 1978 | 95038           | 14170          | 190756           | 47143             | 51430               | 23521 | 184758 | 30654 | 136642 | 46896  |
| 1979 | 95834           | 13997          | 196449           | 47377             | 51977               | 23678 | 184920 | 30234 | 152401 | 57023  |
| 1980 | 96514           | 13808          | 202050           | 47552             | 52461               | 23805 | 184832 | 29760 | 169756 | 69249  |
| 1981 | 97063           | 13663          | 207518           | 47660             | 52875               | 23900 | 184904 | 29273 | 188822 | 83977  |
| 1982 | 97449           | 13373          | 212785           | 47690             | 53206               | 23955 | 183836 | 28765 | 209635 | 101670 |
| 1983 | 97667           | 13135          | 217800           | 47636             | 53443               | 23968 | 182863 | 28198 | 232439 | 122873 |
| 1984 | 97686           | 12869          | 222479           | 47484             | 53573               | 23931 | 181527 | 27535 | 257140 | 148195 |
| 1985 | 97490           | 12580          | 226757           | 47229             | 53584               | 23842 | 179803 | 26926 | 283839 | 178342 |

SOURCE:

CENSO NACIONAL DE POBLACION Y VIVIENDAS, 1962 Y 1972, DIRECCION GENERAL DE ESTADISTICA CENSOS (R=RURAL, U=URBANA)

TABLE 29  
POPULATION PROJECTIONS 1972-1985  
RURAL AND URBAN, BY DEPARTMENT

| YEAR | (R) CENTRAL | (U)    | (R) NEEMBUCU | (U)   | (R) AMABAY | (U)   | (R) CHACO | (U)   | ASUNCION | TOTAL   |
|------|-------------|--------|--------------|-------|------------|-------|-----------|-------|----------|---------|
| 1972 | 173566      | 136824 | 50853        | 22235 | 40032      | 25079 | 49929     | 20066 | 388958   | 2357938 |
| 1973 | 176492      | 144009 | 51756        | 23265 | 42214      | 26495 | 49507     | 20530 | 400572   | 2424907 |
| 1974 | 178380      | 152394 | 52400        | 24316 | 44789      | 28227 | 48886     | 20903 | 411810   | 2494501 |
| 1975 | 180192      | 161172 | 53010        | 25525 | 47492      | 30054 | 48146     | 21270 | 423110   | 2566841 |
| 1976 | 181883      | 170344 | 53593        | 26710 | 50324      | 31977 | 47387     | 21630 | 434433   | 2642050 |
| 1977 | 183447      | 179887 | 54135        | 27927 | 53283      | 33995 | 46600     | 21977 | 445690   | 2719986 |
| 1978 | 184839      | 189775 | 54629        | 29171 | 56357      | 36105 | 45791     | 22307 | 456779   | 2800497 |
| 1979 | 186035      | 199987 | 55068        | 30437 | 59544      | 38302 | 44928     | 22618 | 467631   | 2883668 |
| 1980 | 186999      | 210475 | 55438        | 31717 | 62830      | 40582 | 44032     | 22903 | 478120   | 2969311 |
| 1981 | 187703      | 221201 | 55731        | 33003 | 66204      | 42936 | 43094     | 23159 | 488155   | 3057496 |
| 1982 | 183100      | 232094 | 55934        | 34286 | 69644      | 45353 | 42107     | 23380 | 497587   | 3147996 |
| 1983 | 188164      | 243090 | 56038        | 35555 | 73133      | 47821 | 41069     | 23560 | 506299   | 3240960 |
| 1984 | 187846      | 254091 | 56029        | 36797 | 76642      | 50321 | 39575     | 23695 | 514119   | 3335816 |
| 1985 | 187115      | 265003 | 55976        | 37598 | 80142      | 52834 | 38825     | 23777 | 520907   | 3432884 |

SOURCE:

CENSO NACIONAL DE POBLACION Y VIVIENDAS, 1962 Y 1972, DIRECCION GENERAL  
DE ESTADISTICA CENSOS (R=RURAL, U=URBANA)

only other urban growth center that may have significance as a market is Pt. Stroesner, represented by Alto Parana Department. These more or less stable patterns of population distribution will be reflected directly in the patterns of consumption of food products.

#### Projected Domestic Consumption

National projections of volumes of consumption of food product groups are given in Table 30. For product groups that have declining or stable per capita consumption levels, the increased population more than offsets this decline, resulting in an increasing total volume for all products. This result must be qualified in view of the data base from which it was constructed. The authors believe that some of the projections are unrealistically high such as those for fruits, eggs, and dairy products. Without additional data, these projections cannot be adjusted, so they are taken as given.

Three products grown were selected for further proration to urban and rural by departmental level. These product groups are wheat products, rice, and corn products. The results of these prorations are shown in Tables 31-1, 31-2, 31-3, 32-1, 32-2, 32-3, 33-1, 33-2, and 33-3.

The results of these tables indicate the wide spread difference in consumption between rural and urban groups by department as well as the vast differences in consumption by department.

#### Future Industrial Demand

Industrial demand for agricultural products could be projected if adequate data were available. However, since no underlying data on the consumption, use, or markets of agro-industrial products was available, only one projection was constructed. This projection was for the cotton fibre demand for cotton cloth given in Table 41, Section IX.

TABLE 30  
NATIONAL CONSUMPTION BY FOOD PRODUCT GROUP  
CALCULATED 1965-1972, WITH PROJECTIONS THROUGH 1985

METRIC TONS

| YEAR | WHEAT PRODUCTS | RICE   | CCRN PRODUCTS | TUBERS | VEGETABLES | FRUITS | SUGAR  | BEANS | MEATS | EGGS   | DAIRY PRODUCTS | OILS & FATS |       |
|------|----------------|--------|---------------|--------|------------|--------|--------|-------|-------|--------|----------------|-------------|-------|
| 1965 | 0              | 74614  | 25835         | 20821  | 378912     | 32303  | 205244 | 22257 | 17223 | 91857  | 8612           | 63879       | 15080 |
| 1966 | 0              | 75927  | 26914         | 23704  | 382898     | 35382  | 214127 | 23240 | 17879 | 95383  | 9384           | 70007       | 16040 |
| 1967 | 0              | 77270  | 28043         | 26939  | 386970     | 33757  | 223423 | 24371 | 18561 | 99057  | 10228          | 76731       | 17065 |
| 1968 | 0              | 78634  | 29216         | 30729  | 391069     | 42239  | 233111 | 25341 | 19267 | 102866 | 11147          | 84098       | 18154 |
| 1969 | 0              | 80024  | 30438         | 34985  | 395215     | 46502  | 243223 | 26464 | 20001 | 106823 | 12149          | 92173       | 19312 |
| 1970 | 0              | 81258  | 31713         | 39835  | 399411     | 50935  | 253775 | 27635 | 20650 | 110935 | 13241          | 101025      | 20543 |
| 1971 | 0              | 82878  | 33042         | 45354  | 403655     | 55796  | 264788 | 28856 | 21555 | 115206 | 14430          | 110728      | 21853 |
| 1972 | 0              | 84344  | 34426         | 51639  | 407950     | 61118  | 276232 | 30135 | 22377 | 119643 | 15492          | 121364      | 23249 |
| 1973 | 0              | 85956  | 36088         | 53106  | 413121     | 67061  | 288849 | 31526 | 23240 | 124498 | 17047          | 133290      | 24783 |
| 1974 | 0              | 87672  | 37532         | 54630  | 413479     | 73631  | 302083 | 32995 | 24177 | 129587 | 18599          | 146430      | 26424 |
| 1975 | 0              | 89450  | 39209         | 56214  | 424028     | 80871  | 316013 | 34540 | 25160 | 134927 | 20299          | 160911      | 28184 |
| 1976 | 0              | 91286  | 40967         | 57860  | 429769     | 88845  | 330675 | 36166 | 26190 | 140525 | 22158          | 176874      | 30069 |
| 1977 | 0              | 93182  | 42818         | 59568  | 435692     | 97632  | 346101 | 37879 | 27268 | 146388 | 24194          | 194466      | 32088 |
| 1978 | 0              | 95125  | 44752         | 61331  | 441727     | 107290 | 362271 | 39675 | 28392 | 152510 | 26420          | 213824      | 34245 |
| 1979 | 0              | 97119  | 46782         | 63153  | 447890     | 117919 | 379236 | 41562 | 29566 | 158899 | 28854          | 235132      | 36551 |
| 1980 | 0              | 99155  | 48902         | 65028  | 454140     | 129602 | 396995 | 43536 | 30786 | 165560 | 31510          | 258563      | 39011 |
| 1981 | 0              | 101231 | 51118         | 66959  | 460476     | 142440 | 415586 | 45606 | 32061 | 172499 | 34412          | 284330      | 41637 |
| 1982 | 0              | 103343 | 53428         | 68941  | 466856     | 156535 | 435004 | 47771 | 33381 | 179710 | 37578          | 312632      | 44434 |
| 1983 | 0              | 105490 | 55840         | 70975  | 473281     | 172009 | 455284 | 50033 | 34755 | 187206 | 41033          | 343720      | 47417 |
| 1984 | 0              | 107657 | 58347         | 73055  | 479699     | 186975 | 476419 | 52389 | 36177 | 194976 | 44793          | 377826      | 50588 |
| 1985 | 0              | 109849 | 60955         | 75180  | 486108     | 207574 | 498436 | 54847 | 37652 | 203028 | 48888          | 415233      | 53962 |

SOURCE:

TABLE 15, TABLE 27, TABLE 28.

TABLE 31-1  
RURAL CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

| WHEAT PRODUCTS |            |           |          |       |          |         |        |          |           |           |         |          |
|----------------|------------|-----------|----------|-------|----------|---------|--------|----------|-----------|-----------|---------|----------|
| METRIC TONS    |            |           |          |       |          |         |        |          |           |           |         |          |
| YEAR           | CONCEPCION | SAN PEDRO | CORDOERA | GUIRA | GAAGUAZU | GAAZAPA | ITAPUA | MISIONES | PARAGUARI | A' PARANA | CENTRAL | NEEMBUCU |
| 1965           | 1666       | 2295      | 1915     | 2735  | 3297     | 563     | 2278   | 505      | 2356      | 833       | 4341    | 329      |
| 1966           | 1697       | 2372      | 1996     | 2719  | 3418     | 569     | 2332   | 507      | 2345      | 927       | 4344    | 330      |
| 1967           | 1729       | 2448      | 1975     | 2703  | 3553     | 570     | 2335   | 510      | 2331      | 1024      | 4343    | 330      |
| 1968           | 1759       | 2526      | 1853     | 2684  | 3690     | 571     | 2438   | 511      | 2316      | 1131      | 4339    | 330      |
| 1969           | 1739       | 2603      | 1830     | 2664  | 3830     | 571     | 2490   | 512      | 2299      | 1247      | 4332    | 330      |
| 1970           | 1517       | 2631      | 1805     | 2641  | 3972     | 571     | 2541   | 513      | 2231      | 1374      | 4322    | 330      |
| 1971           | 1844       | 2759      | 1779     | 2616  | 4115     | 570     | 2590   | 514      | 2250      | 1514      | 4308    | 330      |
| 1972           | 1864       | 2842      | 1734     | 2557  | 4242     | 564     | 2633   | 510      | 2220      | 1762      | 4255    | 326      |
| 1973           | 1895       | 2920      | 1722     | 2557  | 4419     | 566     | 2635   | 512      | 2211      | 1972      | 4261    | 327      |
| 1974           | 1921       | 3003      | 1695     | 2530  | 4576     | 564     | 2737   | 512      | 2189      | 2055      | 4241    | 327      |
| 1975           | 1947       | 3086      | 1658     | 2502  | 4735     | 562     | 2736   | 512      | 2165      | 2275      | 4219    | 325      |
| 1976           | 1971       | 3167      | 1640     | 2471  | 4896     | 560     | 2833   | 511      | 2140      | 2508      | 4194    | 324      |
| 1977           | 1995       | 3250      | 1611     | 2440  | 5059     | 557     | 2879   | 509      | 2114      | 2760      | 4166    | 321      |
| 1978           | 2016       | 3331      | 1580     | 2406  | 5223     | 554     | 2923   | 508      | 2095      | 3034      | 4133    | 320      |
| 1979           | 2035       | 3410      | 1549     | 2370  | 5380     | 550     | 2964   | 505      | 2055      | 3332      | 4096    | 317      |
| 1980           | 2051       | 3488      | 1517     | 2332  | 5540     | 546     | 3002   | 502      | 2022      | 3655      | 4053    | 314      |
| 1981           | 2065       | 3561      | 1483     | 2291  | 5697     | 541     | 3037   | 498      | 1998      | 4005      | 4009    | 312      |
| 1982           | 2077       | 3632      | 1448     | 2249  | 5850     | 535     | 3068   | 494      | 1952      | 4381      | 3957    | 308      |
| 1983           | 2087       | 3699      | 1412     | 2203  | 5999     | 528     | 3096   | 489      | 1914      | 4787      | 3901    | 304      |
| 1984           | 2091       | 3761      | 1374     | 2156  | 6143     | 521     | 3117   | 483      | 1873      | 5221      | 3841    | 300      |
| 1985           | 2095       | 3817      | 1336     | 2105  | 6279     | 513     | 3135   | 477      | 1830      | 5665      | 3775    | 295      |

SOURCE:

TABLE 30 -- PROPORTION BY URBAN AND RURAL POPULATION BY DEPARTMENT  
GEOGRAPHICAL DIFFERENCES AS PRESENTED IN 1965 NUTRITION SURVEY

TABLE 31-1  
RURAL CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

| WHEAT PRODUCTS |        |       |       |
|----------------|--------|-------|-------|
| METRIC TONS    |        |       |       |
| YEAR           | AMABAY | CHACO | TOTAL |
| 1965           | 698    | 3911  | 27722 |
| 1966           | 734    | 3812  | 28001 |
| 1967           | 768    | 3711  | 28280 |
| 1968           | 806    | 3609  | 28562 |
| 1969           | 844    | 3506  | 28847 |
| 1970           | 883    | 3406  | 29135 |
| 1971           | 923    | 3305  | 29425 |
| 1972           | 973    | 3182  | 29719 |
| 1973           | 1011   | 3113  | 30071 |
| 1974           | 1057   | 3020  | 30437 |
| 1975           | 1103   | 2930  | 30816 |
| 1976           | 1152   | 2840  | 31207 |
| 1977           | 1200   | 2751  | 31609 |
| 1978           | 1249   | 2660  | 32018 |
| 1979           | 1301   | 2570  | 32434 |
| 1980           | 1351   | 2482  | 32855 |
| 1981           | 1402   | 2392  | 33290 |
| 1982           | 1454   | 2301  | 33706 |
| 1983           | 1504   | 2215  | 34135 |
| 1984           | 1555   | 2124  | 34559 |
| 1985           | 1604   | 2034  | 34982 |

SOURCE:

TABLE 30 -- PRORATION BY URBAN AND RURAL POPULATION BY DEPARTMENT  
GEOGRAPHICAL DIFFERENCES AS PRESENTED IN 1965 NUTRITION SURVEY

TABLE 31-2  
RURAL CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

| RICE        |            |           |          |       |          |         |        |          |            |           |         |          |
|-------------|------------|-----------|----------|-------|----------|---------|--------|----------|------------|-----------|---------|----------|
| METRIC TONS |            |           |          |       |          |         |        |          |            |           |         |          |
| YEAR        | CONCEPCION | SAN PEDRO | CORDOERA | GUIRA | GAAGUAZU | GAAZAPA | ITAPUA | MISIONES | PARAGUIARI | A* PARANA | CENTRAL | NEEMBUCU |
| 1965        | 606        | 833       | 1472     | 1024  | 1234     | 212     | 3697   | 1317     | 2072       | 306       | 2646    | 122      |
| 1966        | 635        | 884       | 1499     | 1047  | 1237     | 217     | 3891   | 1361     | 2119       | 348       | 2723    | 126      |
| 1967        | 666        | 939       | 1524     | 1070  | 1376     | 224     | 4092   | 1405     | 2166       | 395       | 2800    | 129      |
| 1968        | 696        | 997       | 1549     | 1094  | 1471     | 231     | 4302   | 1450     | 2213       | 443       | 2978    | 133      |
| 1969        | 729        | 1057      | 1574     | 1116  | 1569     | 238     | 4519   | 1495     | 2262       | 508       | 2956    | 137      |
| 1970        | 762        | 1121      | 1598     | 1139  | 1676     | 244     | 4748   | 1541     | 2309       | 577       | 3035    | 141      |
| 1971        | 797        | 1187      | 1621     | 1161  | 1787     | 251     | 4983   | 1588     | 2355       | 655       | 3113    | 145      |
| 1972        | 830        | 1262      | 1635     | 1176  | 1919     | 257     | 5227   | 1629     | 2397       | 785       | 3173    | 148      |
| 1973        | 875        | 1346      | 1691     | 1216  | 2056     | 267     | 5537   | 1697     | 2467       | 866       | 3259    | 154      |
| 1974        | 914        | 1423      | 1701     | 1237  | 2135     | 274     | 5799   | 1745     | 2512       | 982       | 3378    | 158      |
| 1975        | 957        | 1511      | 1729     | 1264  | 2341     | 282     | 6099   | 1800     | 2568       | 1119      | 3471    | 163      |
| 1976        | 1001       | 1603      | 1758     | 1290  | 2500     | 290     | 6409   | 1858     | 2622       | 1274      | 3565    | 167      |
| 1977        | 1047       | 1700      | 1735     | 1317  | 2679     | 299     | 6735   | 1916     | 2676       | 1450      | 3660    | 172      |
| 1978        | 1094       | 1802      | 1811     | 1343  | 2850     | 307     | 7071   | 1973     | 2732       | 1643      | 3757    | 177      |
| 1979        | 1142       | 1908      | 1837     | 1369  | 3040     | 315     | 7420   | 2032     | 2785       | 1873      | 3852    | 182      |
| 1980        | 1192       | 2021      | 1862     | 1394  | 3240     | 324     | 7780   | 2090     | 2838       | 2126      | 3947    | 186      |
| 1981        | 1243       | 2136      | 1835     | 1419  | 3450     | 332     | 8150   | 2143     | 2890       | 2413      | 4041    | 191      |
| 1982        | 1295       | 2257      | 1907     | 1442  | 3670     | 340     | 8529   | 2208     | 2938       | 2734      | 4133    | 196      |
| 1983        | 1348       | 2382      | 1927     | 1465  | 3901     | 349     | 8917   | 2265     | 2986       | 3095      | 4223    | 200      |
| 1984        | 1401       | 2513      | 1945     | 1486  | 4142     | 357     | 9311   | 2320     | 3030       | 3502      | 4311    | 205      |
| 1985        | 1455       | 2645      | 1961     | 1506  | 4391     | 364     | 9714   | 2377     | 3071       | 3956      | 4394    | 209      |

SOURCE:

TABLE 30 -- PREPARATION BY URBAN AND RURAL POPULATION BY DEPARTMENT  
GEOGRAPHICAL DIFFERENCES AS PRESENTED IN 1965 NUTRITION SURVEY

TABLE 31-2  
 CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

RICE

METRIC TONS

YEAR            AMAHAY        CHACO        TOTAL

1965            254           690        16454  
 1966            273           690        17100  
 1967            295           690        17771  
 1968            318           690        18469  
 1969            343           691        19194

1970            369           690        19947  
 1971            398           690        20730  
 1972            432           685        21544  
 1973            466           696        22621  
 1974            501           694        23507

1975            540           695        24538  
 1976            584           697        25617  
 1977            629           697        26753  
 1978            677           698        27939  
 1979            729           693        29183

1980            785           697        30481  
 1981            843           695        31836  
 1982            905           694        33248  
 1983            971           692        34721  
 1984            1039          689        36250

1985            1113          684        37839

SOURCE:

TABLE 30 -- PRORATION BY URBAN AND RURAL POPULATION BY DEPARTMENT  
 GEOGRAPHICAL DIFFERENCES AS PRESENTED IN 1965 NUTRITION SURVEY

TABLE 31-3  
RURAL CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

| RURAL CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT |            |           |          |       |          |         |        |          |            |           |         |          |
|---|------------|-----------|----------|-------|----------|---------|--------|----------|------------|-----------|---------|----------|
| CCRN PRODUCTS   |            |           |          |       |          |         |        |          |            |           |         |          |
| METRIC TONS   |            |           |          |       |          |         |        |          |            |           |         |          |
| YEAR  | CONCEPCION | SAN PEDRO | COPU'ERA | GUIRA | GAAGUAZU | GAAZAPA | ITAPUA | MISIONES | PARAGUIAPI | A* PARANA | CENTRAL | NFEMBUKU |
| 1965  | 506        | 597       | 1637     | 1236  | 1088     | 1797    | 3676   | 1203     | 2501       | 255       | 582     | 1155     |
| 1966  | 581        | 811       | 1823     | 1383  | 1180     | 2016    | 4235   | 1361     | 2800       | 318       | 655     | 1372     |
| 1967  | 565        | 943       | 2030     | 1549  | 1300     | 2274    | 4875   | 1538     | 3134       | 395       | 737     | 1467     |
| 1968  | 762        | 1095      | 2258     | 1731  | 1614     | 2553    | 5611   | 1739     | 3506       | 491       | 829     | 1655     |
| 1969  | 873        | 1272      | 2512     | 1935  | 1837     | 2888    | 6455   | 1982     | 3921       | 610       | 933     | 1854     |
| 1970  | 995        | 1471      | 2784     | 2156  | 2194     | 3242    | 7400   | 2209     | 4369       | 755       | 1345    | 2091     |
| 1971  | 1144       | 1712      | 3105     | 2415  | 2576     | 3692    | 3524   | 2499     | 4898       | 940       | 1178    | 2362     |
| 1972  | 1308       | 1995      | 3429     | 2640  | 3032     | 4100    | 5811   | 2808     | 5441       | 1238      | 1315    | 2643     |
| 1973  | 1351       | 2082      | 3451     | 2712  | 3179     | 4177    | 10170  | 2364     | 5503       | 1336      | 1339    | 2691     |
| 1974  | 1394       | 2179      | 3459     | 2731  | 3351     | 4242    | 10546  | 2914     | 5545       | 1501      | 1357    | 2731     |
| 1975  | 1433       | 2281      | 3465     | 2750  | 3531     | 4305    | 10933  | 2965     | 5587       | 1685      | 1374    | 2771     |
| 1976  | 1484       | 2397      | 3471     | 2769  | 3719     | 4569    | 11328  | 3017     | 5627       | 1891      | 1392    | 2812     |
| 1977  | 1531       | 2495      | 3476     | 2786  | 3918     | 4432    | 11726  | 3065     | 5665       | 2121      | 1409    | 2850     |
| 1978  | 1578       | 2608      | 3478     | 2802  | 4124     | 4493    | 12150  | 3115     | 5700       | 2379      | 1476    | 2890     |
| 1979  | 1624       | 2725      | 3480     | 2817  | 4337     | 4553    | 12572  | 3163     | 5731       | 2666      | 1442    | 2927     |
| 1980  | 1672       | 2844      | 3477     | 2829  | 4560     | 4608    | 13003  | 3210     | 5759       | 2936      | 1458    | 2962     |
| 1981  | 1720       | 2965      | 3473     | 2840  | 4739     | 4653    | 13435  | 3255     | 5784       | 3341      | 1472    | 2996     |
| 1982  | 1763       | 3092      | 3486     | 2848  | 5026     | 4714    | 13871  | 3298     | 5803       | 3736      | 1476    | 3028     |
| 1983  | 1815       | 3221      | 3459     | 2854  | 5270     | 4761    | 14309  | 3339     | 5817       | 4174      | 1497    | 3056     |
| 1984  | 1862       | 3349      | 3442     | 2856  | 5520     | 4805    | 14745  | 3376     | 5826       | 4658      | 1508    | 3083     |
| 1985  | 1908       | 3481      | 3425     | 2856  | 5776     | 4842    | 15177  | 3411     | 5828       | 5192      | 1517    | 3106     |

SOURCE:

TABLE 30 -- POPULATION BY UPPAN AND RURAL POPULATION BY DEPARTMENT  
GEOGRAPHICAL DIFFERENCES AS PRESENTED IN 1965 NUTRITION SURVEY

TABLE 31-3  
RURAL CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

CORN PRODUCTS

METRIC TONS

| YEAR | AMABAY | CHACO | TOTAL |
|------|--------|-------|-------|
|------|--------|-------|-------|

|      |     |   |       |
|------|-----|---|-------|
| 1965 | 211 | 2 | 16455 |
| 1966 | 249 | 2 | 16714 |
| 1967 | 295 | 2 | 21293 |
| 1968 | 347 | 2 | 24274 |
| 1969 | 411 | 3 | 27525 |

|      |     |   |       |
|------|-----|---|-------|
| 1970 | 482 | 3 | 31203 |
| 1971 | 570 | 4 | 35598 |
| 1972 | 630 | 4 | 40483 |
| 1973 | 717 | 4 | 41576 |
| 1974 | 763 | 4 | 42717 |

|      |      |   |       |
|------|------|---|-------|
| 1975 | 811  | 4 | 43902 |
| 1976 | 863  | 5 | 45132 |
| 1977 | 917  | 5 | 46406 |
| 1978 | 973  | 5 | 47720 |
| 1979 | 1035 | 5 | 49077 |

|      |      |   |       |
|------|------|---|-------|
| 1980 | 1097 | 5 | 50470 |
| 1981 | 1163 | 5 | 51905 |
| 1982 | 1232 | 5 | 53373 |
| 1983 | 1304 | 5 | 54878 |
| 1984 | 1378 | 6 | 56414 |

|      |      |   |       |
|------|------|---|-------|
| 1985 | 1455 | 6 | 57981 |
|------|------|---|-------|

SOURCE:

TABLE 30 -- PRORATION BY URBAN AND RURAL POPULATION BY DEPARTMENT  
GEOGRAPHICAL DIFFERENCES AS PRESENTED IN 1965 NUTRITION SURVEY

TABLE 32-1  
URBAN CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

| WHEAT PRODUCTS |            |           |         |       |          |         |         |          |           |           |         |          |
|----------------|------------|-----------|---------|-------|----------|---------|---------|----------|-----------|-----------|---------|----------|
| METRIC TONS    |            |           |         |       |          |         |         |          |           |           |         |          |
| YEAR           | CONCEPCION | SAN PEDRO | CORDOBA | GUIRA | GAAGUAZU | GAAZAPA | ITAPIUA | MISTONES | PARAGUARI | A* PAPANA | CENTRAL | NEEMBUCU |
| 1965           | 1457       | 906       | 1669    | 1622  | 1177     | 747     | 2021    | 988      | 1647      | 203       | 4601    | 797      |
| 1966           | 1489       | 926       | 1706    | 1658  | 1203     | 754     | 2066    | 1010     | 1653      | 207       | 4703    | 815      |
| 1967           | 1489       | 933       | 1712    | 1668  | 1256     | 754     | 2074    | 1016     | 1658      | 249       | 4946    | 849      |
| 1968           | 1487       | 947       | 1718    | 1678  | 1310     | 743     | 2081    | 1017     | 1633      | 300       | 5200    | 884      |
| 1969           | 1472       | 962       | 1732    | 1694  | 1372     | 737     | 2096    | 1031     | 1615      | 362       | 5491    | 924      |
| 1970           | 1476       | 963       | 1721    | 1635  | 1417     | 719     | 2084    | 1026     | 1575      | 432       | 5719    | 953      |
| 1971           | 1478       | 976       | 1730    | 1701  | 1481     | 711     | 2096    | 1034     | 1553      | 520       | 6023    | 994      |
| 1972           | 1452       | 979       | 1720    | 1694  | 1547     | 694     | 2082    | 1029     | 1514      | 755       | 6375    | 1037     |
| 1973           | 1466       | 992       | 1733    | 1710  | 1609     | 687     | 2097    | 1037     | 1499      | 804       | 6661    | 1076     |
| 1974           | 1463       | 1002      | 1737    | 1717  | 1577     | 677     | 2102    | 1041     | 1473      | 975       | 6997    | 1120     |
| 1975           | 1459       | 1012      | 1740    | 1723  | 1746     | 666     | 2105    | 1045     | 1443      | 1132      | 7347    | 1163     |
| 1976           | 1453       | 1020      | 1740    | 1728  | 1818     | 655     | 2105    | 1048     | 1421      | 1430      | 7709    | 1209     |
| 1977           | 1447       | 1027      | 1741    | 1732  | 1860     | 644     | 2106    | 1049     | 1396      | 1731      | 8085    | 1255     |
| 1978           | 1439       | 1034      | 1740    | 1735  | 1963     | 632     | 2104    | 1049     | 1368      | 2093      | 8469    | 1302     |
| 1979           | 1431       | 1039      | 1736    | 1735  | 2028     | 621     | 2099    | 1049     | 1340      | 2527      | 8861    | 1348     |
| 1980           | 1420       | 1045      | 1730    | 1732  | 2113     | 608     | 2022    | 1048     | 1310      | 3046      | 9260    | 1395     |
| 1981           | 1406       | 1047      | 1722    | 1728  | 2186     | 594     | 2042    | 1043     | 1240      | 3668      | 9661    | 1441     |
| 1982           | 1390       | 1048      | 1710    | 1720  | 2258     | 580     | 2053    | 1038     | 1247      | 4408      | 10061   | 1486     |
| 1983           | 1372       | 1047      | 1695    | 1708  | 2328     | 565     | 2049    | 1030     | 1213      | 5286      | 10456   | 1529     |
| 1984           | 1351       | 1043      | 1677    | 1693  | 2393     | 549     | 2026    | 1021     | 1177      | 6322      | 10340   | 1570     |
| 1985           | 1326       | 1037      | 1653    | 1673  | 2454     | 531     | 1998    | 1009     | 1159      | 7543      | 11208   | 1607     |

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SOURCE:

TABLE 30 -- PRORATION BY URBAN AND RURAL POPULATION BY DEPARTMENT  
GEOGRAPHICAL DIFFERENCES AS PRESENTED IN 1965 NUTRITION SURVEY

TABLE 32-1  
 URBAN CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

| WHEAT PRODUCTS |        |       |          |       |
|----------------|--------|-------|----------|-------|
| METRIC TONS    |        |       |          |       |
| YEAR           | AMABAY | CHACO | ACUNSIGN | TOTAL |
| 1965           | 803    | 860   | 27386    | 46838 |
| 1966           | 826    | 879   | 27991    | 47924 |
| 1967           | 874    | 890   | 28618    | 48588 |
| 1968           | 925    | 901   | 29250    | 50070 |
| 1969           | 982    | 915   | 29770    | 51175 |
| 1970           | 1030   | 918   | 30401    | 52121 |
| 1971           | 1093   | 932   | 31130    | 53451 |
| 1972           | 1169   | 935   | 31533    | 54623 |
| 1973           | 1225   | 950   | 32336    | 55833 |
| 1974           | 1295   | 960   | 32978    | 57233 |
| 1975           | 1371   | 969   | 33658    | 58632 |
| 1976           | 1447   | 979   | 34313    | 60077 |
| 1977           | 1528   | 989   | 34954    | 61571 |
| 1978           | 1611   | 995   | 35572    | 63105 |
| 1979           | 1697   | 1002  | 36161    | 64683 |
| 1980           | 1785   | 1008  | 36707    | 66298 |
| 1981           | 1875   | 1011  | 37205    | 67549 |
| 1982           | 1966   | 1013  | 37642    | 69355 |
| 1983           | 2056   | 1014  | 38005    | 71353 |
| 1984           | 2147   | 1010  | 38278    | 73096 |
| 1985           | 2235   | 1006  | 38448    | 74865 |

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SOURCE:  
 TABLE 30 -- PROPORTION BY URBAN AND RURAL POPULATION BY DEPARTMENT  
 GEOGRAPHICAL DIFFERENCES AS PRESENTED IN 1965 NUTRITION SURVEY

TABLE 32-2  
 URBAN CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

| RICE        |            |           |         |       |          |         |        |          |           |           |         |          |
|-------------|------------|-----------|---------|-------|----------|---------|--------|----------|-----------|-----------|---------|----------|
| METRIC TONS |            |           |         |       |          |         |        |          |           |           |         |          |
| YEAR        | CONCEPCION | SAN PEDRO | CORDOBA | GUIRA | GAAGUAZU | GAAZAPA | ITAPUA | MISIONES | PARAGUARI | A. PARANA | CENTRAL | NEEMBUCU |
| 1965        | 28         | 17        | 32      | 31    | 27       | 14      | 38     | 19       | 37        | 3         | 84      | 15       |
| 1966        | 31         | 19        | 35      | 34    | 25       | 16      | 43     | 21       | 35        | 4         | 97      | 17       |
| 1967        | 29         | 18        | 34      | 33    | 25       | 15      | 41     | 20       | 33        | 5         | 97      | 17       |
| 1968        | 30         | 19        | 34      | 34    | 26       | 15      | 42     | 20       | 33        | 6         | 104     | 18       |
| 1969        | 31         | 20        | 36      | 35    | 28       | 15      | 43     | 21       | 33        | 7         | 113     | 19       |
| 1970        | 31         | 20        | 35      | 36    | 30       | 15      | 44     | 22       | 33        | 9         | 121     | 20       |
| 1971        | 32         | 22        | 33      | 37    | 34       | 15      | 46     | 23       | 33        | 16        | 139     | 23       |
| 1972        | 32         | 22        | 38      | 37    | 34       | 15      | 46     | 23       | 33        | 17        | 141     | 23       |
| 1973        | 33         | 22        | 39      | 38    | 36       | 15      | 43     | 23       | 34        | 18        | 152     | 24       |
| 1974        | 33         | 23        | 41      | 40    | 39       | 15      | 49     | 24       | 35        | 22        | 162     | 26       |
| 1975        | 35         | 24        | 41      | 41    | 42       | 16      | 50     | 24       | 35        | 29        | 174     | 28       |
| 1976        | 35         | 25        | 42      | 42    | 44       | 16      | 51     | 26       | 35        | 35        | 188     | 30       |
| 1977        | 36         | 26        | 43      | 43    | 43       | 17      | 53     | 26       | 35        | 43        | 202     | 31       |
| 1978        | 37         | 26        | 45      | 45    | 50       | 17      | 54     | 27       | 35        | 54        | 213     | 33       |
| 1979        | 38         | 27        | 46      | 46    | 54       | 17      | 55     | 27       | 36        | 66        | 234     | 36       |
| 1980        | 38         | 29        | 47      | 47    | 58       | 17      | 57     | 29       | 36        | 83        | 253     | 38       |
| 1981        | 40         | 29        | 49      | 49    | 62       | 18      | 58     | 29       | 36        | 103       | 271     | 40       |
| 1982        | 41         | 31        | 49      | 49    | 66       | 18      | 60     | 30       | 36        | 123       | 292     | 43       |
| 1983        | 41         | 31        | 51      | 51    | 70       | 17      | 61     | 31       | 37        | 159       | 314     | 46       |
| 1984        | 42         | 33        | 52      | 52    | 74       | 17      | 63     | 32       | 36        | 197       | 337     | 49       |
| 1985        | 43         | 34        | 54      | 54    | 79       | 18      | 64     | 33       | 37        | 244       | 363     | 53       |

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SOURCE:  
 TABLE 30 -- PRORATION BY URBAN AND RURAL POPULATION BY DEPARTMENT  
 GEOGRAPHICAL DIFFERENCES AS PRESENTED IN 1965 NUTRITION SURVEY

TABLE 32-2  
 URBAN CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

| RICE        |        |       |          |       |
|-------------|--------|-------|----------|-------|
| METRIC TONS |        |       |          |       |
| YEAR        | AMABAY | CHACO | ACUNSION | TOTAL |
| 1965        | 15     | 16    | 9014     | 9379  |
| 1966        | 17     | 18    | 10201    | 10612 |
| 1967        | 17     | 17    | 9971     | 10270 |
| 1968        | 19     | 18    | 10328    | 10745 |
| 1969        | 20     | 19    | 10801    | 11242 |
| 1970        | 22     | 19    | 11307    | 11764 |
| 1971        | 24     | 20    | 11810    | 12310 |
| 1972        | 26     | 21    | 12369    | 12880 |
| 1973        | 28     | 21    | 12932    | 13465 |
| 1974        | 30     | 22    | 13462    | 14023 |
| 1975        | 33     | 23    | 14075    | 14669 |
| 1976        | 35     | 24    | 14721    | 15348 |
| 1977        | 38     | 25    | 15398    | 16063 |
| 1978        | 42     | 25    | 16103    | 16811 |
| 1979        | 45     | 26    | 16842    | 17597 |
| 1980        | 49     | 28    | 17613    | 18419 |
| 1981        | 53     | 28    | 18418    | 19280 |
| 1982        | 57     | 30    | 19250    | 20178 |
| 1983        | 61     | 30    | 20116    | 21117 |
| 1984        | 67     | 32    | 21011    | 22095 |
| 1985        | 72     | 33    | 21935    | 23114 |

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SOURCE:

TABLE 30 -- PRORATION BY URBAN AND RURAL POPULATION BY DEPARTMENT  
 GEOGRAPHICAL DIFFERENCES AS PRESENTED IN 1965 NUTRITION SURVEY

TABLE 32-3  
 URBAN CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

CORN PRODUCTS

METRIC TONS

| YEAR | CONCEPCION | SAN PEDRO | CORDOBA | GUIRA | GAAGUAZU | GAAZAPA | ITAPUA | MISIONES | PARAGUARI | A' PARANA | CENTRAL | NEEMBUCU |
|------|------------|-----------|---------|-------|----------|---------|--------|----------|-----------|-----------|---------|----------|
| 1965 | 233        | 142       | 262     | 253   | 178      | 119     | 317    | 155      | 263       | 26        | 658     | 120      |
| 1966 | 257        | 160       | 294     | 286   | 207      | 132     | 356    | 174      | 249       | 36        | 810     | 140      |
| 1967 | 287        | 180       | 330     | 322   | 242      | 145     | 430    | 196      | 319       | 48        | 954     | 164      |
| 1968 | 320        | 205       | 370     | 361   | 232      | 160     | 448    | 220      | 353       | 65        | 1122    | 190      |
| 1969 | 353        | 232       | 417     | 409   | 330      | 173     | 534    | 243      | 339       | 87        | 1322    | 222      |
| 1970 | 400        | 261       | 466     | 456   | 334      | 195     | 564    | 278      | 426       | 117       | 1549    | 258      |
| 1971 | 446        | 294       | 523     | 513   | 447      | 215     | 631    | 312      | 469       | 156       | 1817    | 301      |
| 1972 | 493        | 330       | 576     | 567   | 535      | 229     | 698    | 344      | 497       | 267       | 2213    | 358      |
| 1973 | 489        | 335       | 581     | 575   | 541      | 227     | 733    | 347      | 492       | 327       | 2339    | 375      |
| 1974 | 493        | 343       | 585     | 580   | 537      | 224     | 733    | 351      | 437       | 398       | 2470    | 392      |
| 1975 | 491        | 345       | 588     | 584   | 615      | 222     | 712    | 354      | 481       | 483       | 2606    | 408      |
| 1976 | 491        | 349       | 590     | 583   | 643      | 218     | 715    | 356      | 473       | 583       | 2745    | 426      |
| 1977 | 503        | 357       | 605     | 602   | 656      | 224     | 732    | 365      | 435       | 602       | 2809    | 436      |
| 1978 | 502        | 361       | 606     | 605   | 635      | 222     | 735    | 366      | 478       | 731       | 2955    | 455      |
| 1979 | 501        | 354       | 608     | 608   | 714      | 217     | 735    | 368      | 470       | 885       | 3105    | 473      |
| 1980 | 499        | 367       | 608     | 608   | 743      | 214     | 736    | 368      | 461       | 1071      | 3254    | 490      |
| 1981 | 485        | 360       | 606     | 609   | 770      | 210     | 734    | 368      | 461       | 1293      | 3433    | 508      |
| 1982 | 491        | 370       | 603     | 607   | 797      | 205     | 729    | 366      | 441       | 1555      | 3550    | 525      |
| 1983 | 485        | 370       | 599     | 603   | 821      | 200     | 723    | 364      | 428       | 1866      | 3691    | 540      |
| 1984 | 477        | 368       | 592     | 598   | 845      | 194     | 715    | 360      | 415       | 2231      | 3826    | 553      |
| 1985 | 467        | 365       | 583     | 589   | 866      | 183     | 704    | 356      | 401       | 2658      | 3949    | 566      |

SOURCE:

TABLE 30 -- PROPORTION BY URBAN AND RURAL POPULATION BY DEPARTMENT  
 GEOGRAPHICAL DIFFERENCES AS PRESENTED IN 1965 NUTRITION SURVEY

TABLE 32-3  
 URBAN CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

CCRN PRODUCTS

METRIC TONS

| YEAR | AMABAY | CHACO | ACUNSION | TOTAL |
|------|--------|-------|----------|-------|
| 1965 | 120    | 134   | 1360     | 4365  |
| 1966 | 143    | 152   | 1555     | 4989  |
| 1967 | 169    | 171   | 1780     | 5707  |
| 1968 | 200    | 194   | 2036     | 6526  |
| 1969 | 237    | 221   | 2311     | 7461  |
| 1970 | 279    | 248   | 2655     | 8534  |
| 1971 | 329    | 281   | 3029     | 9758  |
| 1972 | 385    | 318   | 3365     | 11158 |
| 1973 | 407    | 316   | 3461     | 11533 |
| 1974 | 432    | 320   | 3554     | 11916 |
| 1975 | 459    | 326   | 3642     | 12315 |
| 1976 | 487    | 330   | 3732     | 12731 |
| 1977 | 530    | 343   | 3918     | 13165 |
| 1978 | 563    | 347   | 4004     | 13614 |
| 1979 | 594    | 351   | 4096     | 14079 |
| 1980 | 629    | 354   | 4162     | 14561 |
| 1981 | 660    | 357   | 4228     | 15058 |
| 1982 | 694    | 358   | 4284     | 15572 |
| 1983 | 726    | 358   | 4329     | 16101 |
| 1984 | 758    | 358   | 4358     | 16645 |
| 1985 | 788    | 355   | 4371     | 17203 |

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SOURCE:

TABLE 30 -- PROPORTION BY URBAN AND RURAL POPULATION BY DEPARTMENT  
 GEOGRAPHICAL DIFFERENCES AS PRESENTED IN 1965 NUTRITION SURVEY

TABLE 33-1  
TOTAL CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

| METRIC TONS    |            |           |         |       |          |         |        |          |           |      |        |         |          |
|----------------|------------|-----------|---------|-------|----------|---------|--------|----------|-----------|------|--------|---------|----------|
| WHEAT PRODUCTS |            |           |         |       |          |         |        |          |           |      |        |         |          |
| YEAR           | CONCEPCION | SAN PEDRO | CORDOBA | GUIRA | GAAGUAZU | GAAZAPA | ITAPUA | MISIONES | PARAGUARI | A*   | PARANA | CENTRAL | NEEMBUCU |
| 1965           | 0          | 3123      | 3201    | 3544  | 4357     | 4454    | 1315   | 4249     | 1493      | 4003 | 1041   | 8942    | 1126     |
| 1966           | 0          | 3185      | 3258    | 3502  | 4377     | 4621    | 1333   | 4348     | 1517      | 4028 | 1124   | 9067    | 1145     |
| 1967           | 0          | 3218      | 3396    | 3527  | 4371     | 4809    | 1324   | 4450     | 1526      | 3989 | 1273   | 9249    | 1179     |
| 1968           | 0          | 3266      | 3473    | 3571  | 4362     | 5000    | 1314   | 4519     | 1528      | 3949 | 1431   | 9539    | 1214     |
| 1969           | 0          | 3231      | 3565    | 3562  | 4358     | 5202    | 1308   | 4545     | 1543      | 3914 | 1609   | 9423    | 1254     |
| 1970           | 0          | 3293      | 3664    | 3626  | 4326     | 5389    | 1292   | 4626     | 1530      | 3856 | 1406   | 10041   | 1293     |
| 1971           | 0          | 3222      | 3735    | 3509  | 4317     | 5596    | 1291   | 4685     | 1543      | 3813 | 2034   | 10331   | 1324     |
| 1972           | 0          | 3326      | 3921    | 3453  | 4261     | 5829    | 1258   | 4715     | 1539      | 3734 | 2517   | 10630   | 1363     |
| 1973           | 0          | 3361      | 3912    | 3455  | 4267     | 6023    | 1253   | 4783     | 1549      | 3710 | 2676   | 10922   | 1403     |
| 1974           | 0          | 3384      | 4005    | 3452  | 4247     | 6253    | 1241   | 4939     | 1553      | 3662 | 3040   | 11238   | 1447     |
| 1975           | 0          | 3406      | 4098    | 3493  | 4225     | 6481    | 1228   | 4891     | 1557      | 3613 | 3453   | 11566   | 1488     |
| 1976           | 0          | 3424      | 4187    | 3380  | 4199     | 6714    | 1215   | 4939     | 1559      | 3561 | 3939   | 11953   | 1533     |
| 1977           | 0          | 3442      | 4277    | 3352  | 4172     | 6948    | 1201   | 4985     | 1558      | 3510 | 4491   | 12251   | 1576     |
| 1978           | 0          | 3455      | 4365    | 3320  | 4141     | 7183    | 1186   | 5027     | 1557      | 3453 | 5127   | 12602   | 1622     |
| 1979           | 0          | 3466      | 4449    | 3285  | 4105     | 7418    | 1171   | 5063     | 1554      | 3395 | 5859   | 12957   | 1665     |
| 1980           | 0          | 3471      | 4523    | 3247  | 4064     | 7653    | 1154   | 5094     | 1550      | 3332 | 6701   | 13313   | 1709     |
| 1981           | 0          | 3472      | 4608    | 3205  | 4019     | 7883    | 1135   | 5119     | 1541      | 3268 | 7673   | 13670   | 1753     |
| 1982           | 0          | 3467      | 4680    | 3158  | 3969     | 8103    | 1115   | 5135     | 1532      | 3199 | 8789   | 14015   | 1794     |
| 1983           | 0          | 3459      | 4745    | 3107  | 3911     | 8327    | 1093   | 5145     | 1519      | 3127 | 10073  | 14357   | 1833     |
| 1984           | 0          | 3442      | 4804    | 3051  | 3849     | 8536    | 1070   | 5143     | 1504      | 3050 | 11543  | 14681   | 1870     |
| 1985           | 0          | 3421      | 4854    | 2939  | 3779     | 8733    | 1044   | 5133     | 1486      | 2969 | 13228  | 14993   | 1902     |

SOURCE:

TABLES 31-1, 32-1

TABLE 33-1  
TOTAL CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

METRIC TONS  
WHEAT PRODUCTS

| YEAR | AMARAY | CHACO | ASUACION | TOTAL |
|------|--------|-------|----------|-------|
| 1965 | 0      | 1536  | 4771     | 2734  |
| 1966 | 0      | 1560  | 4691     | 2791  |
| 1967 | 0      | 1642  | 4601     | 2861  |
| 1968 | 0      | 1731  | 4510     | 2925  |
| 1969 | 0      | 1826  | 4471     | 2577  |
| 1970 | 0      | 1913  | 4324     | 3040  |
| 1971 | 0      | 2016  | 4227     | 3113  |
| 1972 | 0      | 2142  | 4117     | 3163  |
| 1973 | 0      | 2237  | 4063     | 3236  |
| 1974 | 0      | 2352  | 3980     | 3293  |
| 1975 | 0      | 2474  | 3899     | 3368  |
| 1976 | 0      | 2509  | 3819     | 3431  |
| 1977 | 0      | 2728  | 3739     | 3495  |
| 1978 | 0      | 2863  | 3655     | 3572  |
| 1979 | 0      | 2998  | 3572     | 3616  |
| 1980 | 0      | 3136  | 3490     | 3670  |
| 1981 | 0      | 3277  | 3403     | 3720  |
| 1982 | 0      | 3429  | 3314     | 3764  |
| 1983 | 0      | 3560  | 3229     | 3805  |
| 1984 | 0      | 3702  | 3134     | 3827  |
| 1985 | 0      | 3839  | 3040     | 3848  |
| 1986 | 0      | 3976  | 2945     | 3921  |
| 1987 | 0      | 4113  | 2850     | 3983  |
| 1988 | 0      | 4250  | 2755     | 4038  |
| 1989 | 0      | 4387  | 2660     | 4093  |
| 1990 | 0      | 4524  | 2565     | 4148  |
| 1991 | 0      | 4661  | 2470     | 4203  |
| 1992 | 0      | 4798  | 2375     | 4258  |
| 1993 | 0      | 4935  | 2280     | 4313  |
| 1994 | 0      | 5072  | 2185     | 4368  |
| 1995 | 0      | 5209  | 2090     | 4423  |
| 1996 | 0      | 5346  | 1995     | 4478  |
| 1997 | 0      | 5483  | 1900     | 4533  |
| 1998 | 0      | 5620  | 1805     | 4588  |
| 1999 | 0      | 5757  | 1710     | 4643  |
| 2000 | 0      | 5894  | 1615     | 4698  |
| 2001 | 0      | 6031  | 1520     | 4753  |
| 2002 | 0      | 6168  | 1425     | 4808  |
| 2003 | 0      | 6305  | 1330     | 4863  |
| 2004 | 0      | 6442  | 1235     | 4918  |
| 2005 | 0      | 6579  | 1140     | 4973  |
| 2006 | 0      | 6716  | 1045     | 5028  |
| 2007 | 0      | 6853  | 950      | 5083  |
| 2008 | 0      | 6990  | 855      | 5138  |
| 2009 | 0      | 7127  | 760      | 5193  |
| 2010 | 0      | 7264  | 665      | 5248  |
| 2011 | 0      | 7401  | 570      | 5303  |
| 2012 | 0      | 7538  | 475      | 5358  |
| 2013 | 0      | 7675  | 380      | 5413  |
| 2014 | 0      | 7812  | 285      | 5468  |
| 2015 | 0      | 7949  | 190      | 5523  |
| 2016 | 0      | 8086  | 95       | 5578  |
| 2017 | 0      | 8223  | 0        | 5633  |
| 2018 | 0      | 8360  | 0        | 5688  |
| 2019 | 0      | 8497  | 0        | 5743  |
| 2020 | 0      | 8634  | 0        | 5798  |
| 2021 | 0      | 8771  | 0        | 5853  |
| 2022 | 0      | 8908  | 0        | 5908  |
| 2023 | 0      | 9045  | 0        | 5963  |
| 2024 | 0      | 9182  | 0        | 6018  |
| 2025 | 0      | 9319  | 0        | 6073  |
| 2026 | 0      | 9456  | 0        | 6128  |
| 2027 | 0      | 9593  | 0        | 6183  |
| 2028 | 0      | 9730  | 0        | 6238  |
| 2029 | 0      | 9867  | 0        | 6293  |
| 2030 | 0      | 10004 | 0        | 6348  |
| 2031 | 0      | 10141 | 0        | 6403  |
| 2032 | 0      | 10278 | 0        | 6458  |
| 2033 | 0      | 10415 | 0        | 6513  |
| 2034 | 0      | 10552 | 0        | 6568  |
| 2035 | 0      | 10689 | 0        | 6623  |
| 2036 | 0      | 10826 | 0        | 6678  |
| 2037 | 0      | 10963 | 0        | 6733  |
| 2038 | 0      | 11100 | 0        | 6788  |
| 2039 | 0      | 11237 | 0        | 6843  |
| 2040 | 0      | 11374 | 0        | 6898  |
| 2041 | 0      | 11511 | 0        | 6953  |
| 2042 | 0      | 11648 | 0        | 7008  |
| 2043 | 0      | 11785 | 0        | 7063  |
| 2044 | 0      | 11922 | 0        | 7118  |
| 2045 | 0      | 12059 | 0        | 7173  |
| 2046 | 0      | 12196 | 0        | 7228  |
| 2047 | 0      | 12333 | 0        | 7283  |
| 2048 | 0      | 12470 | 0        | 7338  |
| 2049 | 0      | 12607 | 0        | 7393  |
| 2050 | 0      | 12744 | 0        | 7448  |
| 2051 | 0      | 12881 | 0        | 7503  |
| 2052 | 0      | 13018 | 0        | 7558  |
| 2053 | 0      | 13155 | 0        | 7613  |
| 2054 | 0      | 13292 | 0        | 7668  |
| 2055 | 0      | 13429 | 0        | 7723  |
| 2056 | 0      | 13566 | 0        | 7778  |
| 2057 | 0      | 13703 | 0        | 7833  |
| 2058 | 0      | 13840 | 0        | 7888  |
| 2059 | 0      | 13977 | 0        | 7943  |
| 2060 | 0      | 14114 | 0        | 7998  |
| 2061 | 0      | 14251 | 0        | 8053  |
| 2062 | 0      | 14388 | 0        | 8108  |
| 2063 | 0      | 14525 | 0        | 8163  |
| 2064 | 0      | 14662 | 0        | 8218  |
| 2065 | 0      | 14799 | 0        | 8273  |
| 2066 | 0      | 14936 | 0        | 8328  |
| 2067 | 0      | 15073 | 0        | 8383  |
| 2068 | 0      | 15210 | 0        | 8438  |
| 2069 | 0      | 15347 | 0        | 8493  |
| 2070 | 0      | 15484 | 0        | 8548  |
| 2071 | 0      | 15621 | 0        | 8603  |
| 2072 | 0      | 15758 | 0        | 8658  |
| 2073 | 0      | 15895 | 0        | 8713  |
| 2074 | 0      | 16032 | 0        | 8768  |
| 2075 | 0      | 16169 | 0        | 8823  |
| 2076 | 0      | 16306 | 0        | 8878  |
| 2077 | 0      | 16443 | 0        | 8933  |
| 2078 | 0      | 16580 | 0        | 8988  |
| 2079 | 0      | 16717 | 0        | 9043  |
| 2080 | 0      | 16854 | 0        | 9098  |
| 2081 | 0      | 16991 | 0        | 9153  |
| 2082 | 0      | 17128 | 0        | 9208  |
| 2083 | 0      | 17265 | 0        | 9263  |
| 2084 | 0      | 17402 | 0        | 9318  |
| 2085 | 0      | 17539 | 0        | 9373  |
| 2086 | 0      | 17676 | 0        | 9428  |
| 2087 | 0      | 17813 | 0        | 9483  |
| 2088 | 0      | 17950 | 0        | 9538  |
| 2089 | 0      | 18087 | 0        | 9593  |
| 2090 | 0      | 18224 | 0        | 9648  |
| 2091 | 0      | 18361 | 0        | 9703  |
| 2092 | 0      | 18498 | 0        | 9758  |
| 2093 | 0      | 18635 | 0        | 9813  |
| 2094 | 0      | 18772 | 0        | 9868  |
| 2095 | 0      | 18909 | 0        | 9923  |
| 2096 | 0      | 19046 | 0        | 9978  |
| 2097 | 0      | 19183 | 0        | 10033 |
| 2098 | 0      | 19320 | 0        | 10088 |
| 2099 | 0      | 19457 | 0        | 10143 |
| 2100 | 0      | 19594 | 0        | 10198 |

SOURCE:

TABLES 31-1, 32-1

TABLE 33-2  
TOTAL CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

| RICE        |            |           |           |       |          |         |        |          |           |           |         |          |     |
|-------------|------------|-----------|-----------|-------|----------|---------|--------|----------|-----------|-----------|---------|----------|-----|
| METRIC TONS |            |           |           |       |          |         |        |          |           |           |         |          |     |
| YEAR        | CONCEPCION | SAN PEDRO | CORDOBERA | GUIRA | GAAGJAZU | GAAZAPA | ITAPUA | MISIONES | PARAGUARI | A' PARANA | CENTRAL | NEEMBUCU |     |
| 1965        | 0          | 634       | 850       | 1504  | 1055     | 1226    | 226    | 3735     | 1336      | 2104      | 309     | 2730     | 137 |
| 1966        | 0          | 657       | 903       | 1534  | 1081     | 1312    | 233    | 3934     | 1382      | 2154      | 352     | 2320     | 143 |
| 1967        | 0          | 695       | 957       | 1558  | 1103     | 1401    | 239    | 4133     | 1425      | 2199      | 400     | 2397     | 146 |
| 1968        | 0          | 726       | 1016      | 1533  | 1128     | 1497    | 246    | 4334     | 1470      | 2246      | 454     | 2332     | 151 |
| 1969        | 0          | 750       | 1077      | 1510  | 1151     | 1527    | 253    | 4562     | 1517      | 2295      | 515     | 3069     | 156 |
| 1970        | 0          | 793       | 1141      | 1634  | 1175     | 1706    | 259    | 4792     | 1563      | 2342      | 586     | 3156     | 161 |
| 1971        | 0          | 827       | 1209      | 1659  | 1198     | 1821    | 266    | 5029     | 1611      | 2398      | 671     | 3252     | 168 |
| 1972        | 0          | 862       | 1284      | 1673  | 1213     | 1953    | 272    | 5273     | 1652      | 2420      | 802     | 3314     | 171 |
| 1973        | 0          | 909       | 1353      | 1720  | 1254     | 2072    | 282    | 5545     | 1720      | 2501      | 884     | 3451     | 178 |
| 1974        | 0          | 947       | 1446      | 1742  | 1277     | 2227    | 289    | 5848     | 1769      | 2547      | 1004    | 3540     | 184 |
| 1975        | 0          | 992       | 1535      | 1770  | 1305     | 2333    | 298    | 6149     | 1824      | 2603      | 1148    | 3645     | 191 |
| 1976        | 0          | 1036      | 1628      | 1800  | 1332     | 2544    | 306    | 6460     | 1884      | 2657      | 1309    | 3753     | 197 |
| 1977        | 0          | 1083      | 1726      | 1829  | 1360     | 2718    | 316    | 6783     | 1942      | 2711      | 1493    | 3862     | 203 |
| 1978        | 0          | 1131      | 1828      | 1856  | 1388     | 2900    | 324    | 7125     | 2000      | 2767      | 1702    | 3975     | 210 |
| 1979        | 0          | 1180      | 1935      | 1883  | 1415     | 3094    | 332    | 7475     | 2059      | 2821      | 1939    | 4086     | 216 |
| 1980        | 0          | 1230      | 2050      | 1909  | 1441     | 3293    | 341    | 7837     | 2119      | 2873      | 2209    | 4200     | 224 |
| 1981        | 0          | 1283      | 2165      | 1934  | 1468     | 3512    | 349    | 8209     | 2177      | 2926      | 2515    | 4312     | 231 |
| 1982        | 0          | 1336      | 2288      | 1956  | 1491     | 3736    | 356    | 8549     | 2238      | 2974      | 2862    | 4425     | 239 |
| 1983        | 0          | 1389      | 2413      | 1978  | 1516     | 3971    | 366    | 8973     | 2296      | 3023      | 3254    | 4537     | 246 |
| 1984        | 0          | 1443      | 2546      | 1997  | 1539     | 4216    | 374    | 9374     | 2352      | 3066      | 3699    | 4648     | 254 |
| 1985        | 0          | 1499      | 2679      | 2015  | 1560     | 4470    | 382    | 9778     | 2410      | 3108      | 4200    | 4757     | 262 |

+129-

SOURCE:

TABLES 31-2, 32-2

TABLE 33-2  
TOTAL CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

RICE

METRIC TONS

| YEAR | AMAHAY | CHACD | ACUNSION | TOTAL |       |
|------|--------|-------|----------|-------|-------|
| 1965 | 0      | 269   | 706      | 9014  | 25835 |
| 1966 | 0      | 290   | 708      | 10201 | 27714 |
| 1967 | 0      | 312   | 707      | 9871  | 29043 |
| 1968 | 0      | 337   | 708      | 10328 | 29216 |
| 1969 | 0      | 363   | 710      | 10801 | 30436 |
| 1970 | 0      | 391   | 709      | 11307 | 31715 |
| 1971 | 0      | 422   | 710      | 11810 | 33043 |
| 1972 | 0      | 458   | 706      | 12359 | 34422 |
| 1973 | 0      | 494   | 717      | 12932 | 36097 |
| 1974 | 0      | 531   | 716      | 13462 | 37529 |
| 1975 | 0      | 573   | 718      | 14075 | 39209 |
| 1976 | 0      | 619   | 721      | 14721 | 40967 |
| 1977 | 0      | 667   | 722      | 15393 | 42917 |
| 1978 | 0      | 719   | 723      | 16103 | 44751 |
| 1979 | 0      | 774   | 724      | 16842 | 46778 |
| 1980 | 0      | 834   | 725      | 17613 | 48903 |
| 1981 | 0      | 896   | 723      | 18419 | 51117 |
| 1982 | 0      | 962   | 724      | 19250 | 53426 |
| 1983 | 0      | 1032  | 722      | 20116 | 55837 |
| 1984 | 0      | 1106  | 721      | 21011 | 58345 |
| 1985 | 0      | 1185  | 717      | 21935 | 60657 |

SOURCE:

TABLES 31-2, 32-2

TABLE 33-3  
TOTAL CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

METRIC TONS  
CORN PRODUCTS

| YEAR | CONCEPCION | SAN PEDRO | CORCOERA | GUIRA | GAAGUAZU | GAALAPA | ITAPUA | MISIONES | PARAGUARI | A' PARANA | CENTRAL | NEMBUCU |
|------|------------|-----------|----------|-------|----------|---------|--------|----------|-----------|-----------|---------|---------|
| 1965 | 0          | 745       | 1309     | 1435  | 1126     | 1906    | 3923   | 1358     | 2724      | 281       | 1273    | 1275    |
| 1966 | 0          | 533       | 2117     | 1669  | 1387     | 2143    | 4571   | 1535     | 3039      | 354       | 1455    | 1442    |
| 1967 | 0          | 532       | 2350     | 1871  | 1622     | 2419    | 5275   | 1734     | 3453      | 443       | 1691    | 1631    |
| 1968 | 0          | 1022      | 2628     | 2092  | 1896     | 2723    | 6058   | 1959     | 3859      | 556       | 1951    | 1945    |
| 1969 | 0          | 1232      | 2921     | 2344  | 2217     | 3066    | 5959   | 2210     | 4310      | 697       | 2255    | 2086    |
| 1970 | 0          | 1345      | 3250     | 2812  | 2512     | 3427    | 7924   | 2487     | 4795      | 872       | 2354    | 2349    |
| 1971 | 0          | 1570      | 3623     | 3229  | 3023     | 3677    | 9165   | 2811     | 5367      | 1066      | 2445    | 2653    |
| 1972 | 0          | 1756      | 4035     | 3247  | 3557     | 4329    | 10509  | 3152     | 5928      | 1505      | 3529    | 3001    |
| 1973 | 0          | 1840      | 4332     | 3237  | 3742     | 4404    | 10873  | 3211     | 5935      | 1663      | 3578    | 3066    |
| 1974 | 0          | 1834      | 4044     | 3211  | 3538     | 4406    | 11254  | 3265     | 6032      | 1359      | 3327    | 3123    |
| 1975 | 0          | 1920      | 4053     | 3234  | 4146     | 4527    | 11545  | 3319     | 6062      | 2163      | 3950    | 3179    |
| 1976 | 0          | 1975      | 4061     | 3357  | 4362     | 4537    | 12043  | 3373     | 6100      | 2479      | 4137    | 3238    |
| 1977 | 0          | 2034      | 4081     | 3388  | 4574     | 4656    | 12498  | 3430     | 6150      | 2723      | 4218    | 3255    |
| 1978 | 0          | 2080      | 4084     | 3407  | 4809     | 4715    | 12805  | 3481     | 6178      | 3110      | 4341    | 3345    |
| 1979 | 0          | 2125      | 4059     | 3425  | 5051     | 4770    | 13307  | 3521     | 6201      | 3551      | 4547    | 3400    |
| 1980 | 0          | 2171      | 4035     | 3437  | 5303     | 4822    | 13729  | 3578     | 6220      | 4057      | 4712    | 3452    |
| 1981 | 0          | 2215      | 4079     | 3449  | 5559     | 4873    | 14169  | 3623     | 6235      | 4534      | 4475    | 3504    |
| 1982 | 0          | 2259      | 4039     | 3455  | 5823     | 4819    | 14600  | 3664     | 6244      | 5241      | 5036    | 3553    |
| 1983 | 0          | 2300      | 4055     | 3457  | 5041     | 4761    | 15032  | 3703     | 6245      | 6040      | 5148    | 3596    |
| 1984 | 0          | 2339      | 4034     | 3454  | 6305     | 4699    | 15460  | 3736     | 6241      | 5559      | 5334    | 3636    |
| 1985 | 0          | 2375      | 4003     | 3445  | 6642     | 5030    | 15881  | 3767     | 6229      | 7850      | 5466    | 3672    |

SOURCE:

TABLES 31-3, 32-3

TABLE 33-3  
TOTAL CONSUMPTION OF FOOD PRODUCT GROUP BY DEPARTMENT

METRIC TONS

CORN PRODUCTS

| YEAR | AMIBAY | CHACO | ACUNSTIN | TOTAL |       |
|------|--------|-------|----------|-------|-------|
| 1965 | 0      | 331   | 136      | 1360  | 20923 |
| 1966 | 0      | 392   | 154      | 1553  | 23707 |
| 1967 | 0      | 464   | 173      | 1780  | 26991 |
| 1968 | 0      | 547   | 196      | 2036  | 30729 |
| 1969 | 0      | 643   | 224      | 2311  | 34992 |
| 1970 | 0      | 761   | 251      | 2655  | 39737 |
| 1971 | 0      | 899   | 285      | 3029  | 45262 |
| 1972 | 0      | 1065  | 312      | 3365  | 51645 |
| 1973 | 0      | 1124  | 320      | 3461  | 53111 |
| 1974 | 0      | 1195  | 324      | 3554  | 54635 |
| 1975 | 0      | 1270  | 350      | 3642  | 56216 |
| 1976 | 0      | 1350  | 335      | 3752  | 57865 |
| 1977 | 0      | 1447  | 343      | 3913  | 59573 |
| 1978 | 0      | 1536  | 352      | 4004  | 61336 |
| 1979 | 0      | 1629  | 356      | 4035  | 63156 |
| 1980 | 0      | 1725  | 359      | 4152  | 65033 |
| 1981 | 0      | 1823  | 362      | 4223  | 66965 |
| 1982 | 0      | 1926  | 363      | 4234  | 68948 |
| 1983 | 0      | 2030  | 363      | 4328  | 70980 |
| 1984 | 0      | 2136  | 364      | 4358  | 73062 |
| 1985 | 0      | 2243  | 361      | 4371  | 75186 |

SOURCE:

TABLES 31-3, 32-3

## SECTION VIII

### PROJECTED EXPORT MARKET POTENTIALS

#### Trends in World Production and Markets

The annual volumes of total world production for major crops produced in Paraguay are shown in Table 34 over the period of 1962 through 1974. World production of rice, corn, tobacco and cotton has been increasing at average growth rates of 2 to 3 percent per year. World soybean production has increased at about 5 percent per year over the period.

Table 35 shows the volume of world export trade for the same selected commodities and for beef. Long term trends in the volumes of world trade for rice and cotton do not vary measurably from production. The corresponding trends in world products show significant differences. The average annual rate of increase in the volumes of world trade for soybeans and corn are more than twice the corresponding average increases in world production growth rates, and that for tobacco is just under twice the annual rate of increase in world production of tobacco. The major portions of increased world production of soybeans, corn and tobacco are being funneled into export channels rather than being utilized for domestic consumption within the producing country. In contrast, the increasing world production of rice and cotton is moving into expanding domestic markets so that the rates of increase in world trade for these commodities remain relatively modest.

#### Paraguay's Market Share of World Trade

The volumes of registered exports by Paraguay of the commodities included in Table 35 are shown for the period 1962 through 1975 in Table 8, Section IV. Paraguay supplies relatively small percentages of total world trade in these commodities, but is highly dependent upon maintaining her

TABLE 34  
 WORLD PRODUCTION OF SELECTED COMMODITIES, 1962 - 1974  
 1000 Metric Tons

| YEAR | RICE    | SOYBEANS | CORN     | TOBACCO | COTTON  |
|------|---------|----------|----------|---------|---------|
| 1962 | 245,262 | 30,753   | 210,461  | 3,974   | 10,447  |
| 1963 | 255,292 | 31,659   | 221,961  | 4,262   | 11,118  |
| 1964 | 265,588 | 32,354   | 215,903  | 4,625   | 11,299  |
| 1965 | 256,617 | 36,507   | 227,814  | 4,277   | 11,465  |
| 1966 | 254,828 | 39,080   | 242,245  | 4,615   | 10,716  |
| 1967 | 277,488 | 40,735   | 266,873  | 4,892   | 10,395  |
| 1968 | 284,729 | 43,998   | 252,701  | 4,755   | 11,358  |
| 1969 | 293,485 | 45,188   | 267,601  | 4,581   | 11,430  |
| 1970 | 308,767 | 46,508*  | 261,312  | 4,681   | 11,727  |
| 1971 | 309,096 | 48,467*  | 305,612  | 4,521   | 12,162  |
| 1972 | 295,492 | 52,682*  | 303,390* | 4,810*  | 13,163* |
| 1973 | 324,468 | 62,311   | 310,391  | 4,959   | 13,396  |
| 1974 | 323,201 | 56,803   | 292,990  | 5,223   | 13,669  |

\*Average Figures for the same year from different issues of the source.

Source: PRODUCTION YEARBOOK, F.A.O., UN, Rome

TABLE 35

## VOLUME OF WORLD EXPORT TRADE FOR SELECTED COMMODITIES, 1962 - 1974

1000 Metric Tons

| YEAR | RICE   | SOYBEANS | CORN    | TOBACCO | COTTON | Meat of Bovine:<br>Animals (Fresh:<br>Chilled or<br>Frozen) | CANNED<br>MEATS |
|------|--------|----------|---------|---------|--------|---|-----------------|
| 1962 | 6,297  | 4,916    | 19,814  | 848     | 3,387  | 1,342   | 524             |
| 1963 | 7,177  | 5,227    | 20,959  | 886     | 3,710  | 1,586   | 592             |
| 1964 | 7,488  | 6,290    | 22,335  | 1,008   | 3,913  | 1,482   | 565             |
| 1965 | 7,898  | 6,975    | 25,028  | 969     | 3,727  | 1,466   | 635             |
| 1966 | 7,403  | 7,521    | 25,505  | 923     | 3,928  | 1,488   | 702             |
| 1967 | 7,068  | 8,143    | 27,191  | 1,008   | 3,868  | 1,598   | 713             |
| 1968 | 6,432  | 8,756    | 28,567  | 993     | 3,883  | 1,642   | 733             |
| 1969 | 7,581* | 9,327    | 27,148* | 1,000   | 3,738* | 2,001   | 759             |
| 1970 | 8,824  | 12,621   | 29,422  | 986     | 3,943  | 2,085   | 808             |
| 1971 | 9,319  | 12,282   | 30,854  | 1,033   | 4,025  | 1,974   | 823             |
| 1972 | 9,464  | 13,815   | 37,286  | 1,210   | 4,007  | 2,348   | 858             |
| 1973 | 9,265  | 15,613   | 48,061  | 1,220   | 4,711  | 2,556   | 902             |
| 1974 | 8,854  | 17,186   | 50,549  | 1,382   | 3,955  | 2,286   | 892             |

\*Average Figures for the same year from different issues of the source

Source: TRADE YEARBOOK, F.A.O., UN, Rome

share of world markets in order to sustain continued economic growth and development of the economy. Since 1965 Paraguay has been able to capture an increasing share of total world export markets for soybeans, cotton and tobacco. Paraguay's share of total world trade for soybeans and soybean products increased from about 0.30 percent in 1964-65 to slightly over 1.0 percent for 1974-75. The corresponding market share of total world exports of tobacco increased from 1.4 percent in 1964-65 to 1.97 percent in 1974-75, and that for cotton from 0.20 percent in 1964-65 to 0.71 percent in 1974-75.

Paraguay's share of the total world export market for beef products rose slightly through 1973, reaching about 1 percent of total world trade, but has dropped sharply since that time with the declining world prices for beef.

#### Export Potentials for Soybeans, Cotton and Tobacco

With the exception of essence oils, for which Paraguay supplies a large percentage of world demand and is in a position to maintain competitive leadership, Paraguay's export potentials depend upon the total world supplies, most of which came from other countries. Paraguay must compete with exports by major developed countries as well as those by other developing countries. Of the two, the competitive exports by the developing countries are becoming increasingly dominant in world markets.

In the mid-1950's, agricultural exports by the developed countries amounted to about 49 percent of the world agricultural trade, compared to as a group, 51 percent for the developing countries as a whole. By 1973 the developing countries were supplying 60 percent of the total agricultural exports to world markets. In the case of grain exports, the increasing dominance of the developed countries is more striking. The LDC's market share

of total world grain exports declined from 23 percent in 1955 to 12 percent in 1973. There was also a relative decline in intra-LDC grain trade; exports of grain from one developing country to another declined from 37 percent of total LDC grain imports in 1955 to only 17 percent in 1973.

These figures indicate that Paraguay is one of the few developing countries which has been able to increase exports of major agricultural crop products at growth rates which are more rapid than those of the developed countries. It will be increasingly difficult for Paraguay to maintain this counter-trend against increasing competition for export markets by the developed countries. It appears that the more realistic expectation is that Paraguay will be able to maintain the shares of total world export markets now enjoyed.

TABLE 36

PROJECTED EXPORT MARKET POTENTIALS FOR SOYBEANS, COTTON AND TOBACCO

By Paraguay, 1976 - 1985

1000 Metric Tons

| CROP     | YEAR  |       |       |       |       |       |       |       |       |       |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|          | 1976  | 1977  | 1978  | 1979  | 1980  | 1981  | 1982  | 1983  | 1984  | 1985  |
| Soybeans | 192.2 | 203.0 | 213.7 | 224.5 | 235.3 | 246.0 | 256.8 | 267.6 | 278.4 | 289.1 |
| Cotton   | 31.0  | 31.4  | 31.8  | 32.2  | 32.6  | 32.9  | 33.3  | 33.7  | 34.1  | 34.5  |
| Tobacco  | 25.6  | 26.2  | 26.9  | 27.5  | 28.2  | 28.8  | 29.5  | 30.1  | 30.8  | 31.4  |

Assuming Paraguay's shares of total world export markets remain at the current levels and that long term linear trends in total world trade will be maintained, Paraguay's export potentials for soybeans, cotton and tobacco are indicated by the projections in Table 36. The projections are based upon mathematical linear projections of the historical volumes of world trade shown from Table 35. The soybean projections were checked against U.S.D.A. alternative projections. The cotton and tobacco projections were

checked against 1975 actual world trade preliminary data. The export potentials for Paraguay were then calculated based on existing market shares of total world exports in 1974-75. The indicated average annual growth rates in export market potentials are about 10,770 metric tons of soybeans, 4,000 metric tons of cotton and 650 metric tons of tobacco.

## SECTION IX

### PROJECTED PATTERNS OF SUPPLY AND UTILIZATION

Supply and utilization projections were developed for soybeans, corn, cotton, tobacco, rice and wheat based upon projected production and projected market demands as reported in the previous sections. The projections reflect the assumptions and the extension of trends reported above. The source of the projections are identified in the footnotes to the projected supply and utilization table for each commodity.

#### Soybeans

The projected supply and utilization patterns for soybeans in Paraguay are given in Table 37. The projections indicate a growing surplus balance each year. This means that the growth in soybean production must be limited to the export market potentials, or new markets must be developed. It is possible that domestic markets for soybean meal can be developed as a feed ingredient for poultry and livestock, following the example of Brazil. The domestic market exists for the soybean oil products in human consumption and this market will grow at a rate comparable to that indicated by the surplus shown on the lower line in Table 37. It may be possible to develop new export markets, and thus raise the total export potentials above the figures shown, but it will not be easy. Aside from the difficulties and high cost to Paraguay of exporting through Argentina or Brazil, the international competition for world soybean markets is likely to be increasingly pressing, and increasing Paraguay's share of the world market will be difficult.

In any case, market potentials rather than production potentials represent the more limiting factors to rapid expansion of soybeans in Paraguay.

TABLE 37  
PROJECTED SUPPLY AND UTILIZATION OF SOYBEANS, 1976 - 1985

Metric Tons

|                                   | 1976    | 1977    | 1978    | 1979    | 1980    | 1981    | 1982    | 1983    | 1984    | 1985    |
|-----------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Projected Production <sup>1</sup> | 235,009 | 252,992 | 271,431 | 290,309 | 309,611 | 329,324 | 349,436 | 369,934 | 390,808 | 412,049 |
| Less                              |         |         |         |         |         |         |         |         |         |         |
| Loss <sup>2</sup>                 | 23,501  | 25,299  | 27,143  | 29,031  | 30,961  | 32,932  | 34,944  | 36,993  | 39,081  | 41,205  |
| Seed Requirement <sup>3</sup>     | 17,043  | 19,612  | 22,304  | 25,102  | 27,999  | 31,002  | 34,094  | 37,285  | 40,550  | 44,100  |
| Net Production                    | 194,465 | 208,081 | 221,984 | 236,176 | 250,651 | 265,390 | 280,398 | 295,656 | 311,177 | 326,744 |
| Export Potential <sup>4</sup>     | 192,200 | 203,000 | 213,700 | 224,500 | 235,300 | 246,000 | 256,100 | 267,600 | 278,400 | 289,100 |
| Surplus or Deficit<br>Balance     | 2,265   | 5,081   | 8,284   | 11,676  | 15,351  | 19,390  | 24,298  | 28,656  | 32,777  | 37,644  |

<sup>1</sup>Table A-1.1

<sup>2</sup>Table 15

<sup>3</sup>Table A-2.1, 81.82 Kilo per ha.

<sup>4</sup>Table 36, includes whole beans and soybean products in whole bean equivalent

Corn

The supply and utilization projections for corn in Paraguay are shown in Table 38. Increasing surplus balances are indicated for this crop also, which will have to find markets for poultry and animal feeds in the country or in export markets. Corn is relatively high priced in Paraguay compared to world markets because of the domestic demand for human consumption. Yet only about 21 percent of the net production moves into human consumption.

In the absence of high yielding varieties of dent corn and cultural practices which are competitive with large mechanized operations in other parts of the world, Paraguay's corn farmers find it impossible to produce profitably at prices supported solely by poultry and livestock feed demand, either at home or abroad. Argentina is a major competitor for world markets for flint corn, and enjoys substantially lower marketing and transport costs to reach these markets. It appears that beyond the normal growth in the domestic demand for human consumption, Paraguay must count primarily on on-farm use as feed for poultry and hogs as the direction for market expansion for corn. Even with full exploitation of this potential, overall demand potentials will be more restrictive than production potentials for corn in the years ahead.

TABLE 38

## PROJECTED SUPPLY AND UTILIZATION OF CORN, 1976 - 1985

Metric Tons

|   | 1976    | 1977    | 1978    | 1979    | 1980    | 1981    | 1982    | 1983    | 1984    | 1985    |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Projected Production <sup>1</sup>   | 302,917 | 314,434 | 325,952 | 337,469 | 348,986 | 360,504 | 372,021 | 383,538 | 395,056 | 406,573 |
| Less  |         |         |         |         |         |         |         |         |         |         |
| Loss <sup>2</sup>   | 30,292  | 31,443  | 32,595  | 33,747  | 34,899  | 36,050  | 37,202  | 38,354  | 39,506  | 40,657  |
| Seed Requirement <sup>3</sup>   | 3,249   | 3,326   | 3,400   | 3,474   | 3,545   | 3,615   | 3,684   | 3,752   | 3,818   | 3,884   |
| Net Production  | 269,376 | 279,665 | 289,957 | 300,248 | 310,542 | 320,839 | 331,135 | 341,432 | 351,732 | 362,032 |
| Projected Consumption <sup>4</sup>  | 57,860  | 59,568  | 61,331  | 63,153  | 65,028  | 66,959  | 68,941  | 70,975  | 73,055  | 75,180  |
| Surplus or Deficit<br>Balance Available<br>for Animal Feeds<br>and Export | 211,516 | 220,097 | 228,626 | 237,095 | 245,514 | 253,880 | 262,194 | 270,457 | 278,677 | 286,852 |

<sup>1</sup>Table A-1.1<sup>2</sup>Table 12<sup>3</sup>Table A-2.1, 12.73 Kg/ha<sup>4</sup>Table 30

Cotton

The projections of supply and utilization of cotton indicate that the market potentials represent the limiting factor for this crop also (Table 39). Small deficit balances are indicated through 1978, and thereafter increasing surpluses of cotton will develop in Paraguay if production and utilization (domestic industry plus exports) continue at rates of growth exhibited in the past. In the future care must be exercised to watch world demand and export market potentials very closely, and avoid over-expansion of the area devoted to cotton production on Paraguay's farms. If production is expanded too rapidly, domestic prices will fall to levels which may bankrupt the small cotton farmers, and/or require support prices and subsidies which are beyond the capability of the government to finance.

A word of caution also is in order regarding possible improvements in handling and marketing methods designed to reduce losses of cotton (see the second line of Table 39). Even though such improvements might show favorable benefit-cost relationships, the potential impacts upon market surpluses and low prices must be considered. For example in 1985 if the loss were reduced by 50 percent, the projected surplus for Paraguay as a whole would reach 11,412 metric tons of cotton fibre.

TABLE 39  
PROJECTED SUPPLY AND UTILIZATION OF COTTON, 1976 - 1985

Metric Tons

|  | 1976    | 1977    | 1978    | 1979    | 1980    | 1981    | 1982    | 1983    | 1984    | 1985    |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Projected Production <sup>1</sup>        | 104,500 | 109,533 | 114,694 | 119,977 | 125,379 | 130,897 | 136,525 | 142,262 | 148,104 | 154,049 |
| Less                                     |         |         |         |         |         |         |         |         |         |         |
| Loss <sup>2</sup>                        | 5,225   | 5,477   | 5,735   | 5,999   | 6,269   | 6,544   | 6,826   | 7,113   | 7,405   | 7,702   |
| Net Production                           | 99,275  | 104,056 | 108,959 | 113,978 | 119,110 | 124,353 | 129,699 | 135,149 | 140,699 | 146,347 |
| Fibre Tonnage <sup>3</sup>               | 31,569  | 33,090  | 34,649  | 36,245  | 37,877  | 39,544  | 41,244  | 42,977  | 44,742  | 46,655  |
| Export Potential <sup>4</sup>            | 31,000  | 31,400  | 31,800  | 32,200  | 32,600  | 32,900  | 33,000  | 33,700  | 34,100  | 34,500  |
| Industrial Demand Potential <sup>5</sup> | 3,478   | 3,602   | 3,726   | 3,850   | 3,974   | 4,098   | 4,222   | 4,346   | 4,470   | 4,594   |
| Surplus or Deficit Balance               | -2,909  | -1,912  | -877    | 195     | 1,303   | 2,546   | 4,022   | 4,931   | 6,172   | 7,561   |

<sup>1</sup>Table A-1.1

<sup>2</sup>Table 11

<sup>3</sup>Based on average ginning rate of 31.8 percent fibre

<sup>4</sup>Table 36

<sup>5</sup>Based on projection of the linear trend exhibited from 1965 to 1974

Tobacco

The dangers of over-expansion of tobacco production in Paraguay are even more apparent than is the case for cotton as shown by the projections in Table 40. If the upward trends in production and in market potentials for this crop continue at the same relative rates as has been true over the past 10 years, Paraguay's tobacco farmers will be burdened by serious surpluses as early as 1977 or 1978. By 1985 the indicated surplus based on these trends is 6,558 metric tons, or more than 17 percent of total net production. Excess production of this magnitude certainly would drive market prices received by tobacco farmers to disasterously low levels.

It seems clear that all efforts in Paraguay's tobacco industry should be toward improvement of the quality of the product, and full exploration of the special foreign markets where good quality Paraguay tobacco is preferred. Even so, it may become necessary for the country to impose quotas on tobacco farmers so as to avoid serious problems of over production.

TABLE 40  
 PROJECTED SUPPLY AND UTILIZATION OF TOBACCO, 1976 - 1985  
 Metric Tons

|                                   | :      | :      | :      | :      | :      | :      | :      | :      | :      | :      | : |
|-----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|
|                                   | :      | :      | :      | :      | :      | :      | :      | :      | :      | :      | : |
|                                   | 1976   | 1977   | 1978   | 1979   | 1980   | 1981   | 1982   | 1983   | 1984   | 1985   |   |
| Projected Production <sup>1</sup> | 29,824 | 31,330 | 32,875 | 34,457 | 36,074 | 37,725 | 39,410 | 41,127 | 42,876 | 44,656 |   |
| Less                              |        |        |        |        |        |        |        |        |        |        |   |
| Loss <sup>2</sup>                 | 4,474  | 4,700  | 4,931  | 5,169  | 5,411  | 5,659  | 5,912  | 6,169  | 6,431  | 6,698  |   |
| Net Production                    | 25,350 | 26,630 | 27,944 | 29,288 | 30,663 | 32,066 | 33,498 | 34,958 | 36,445 | 37,958 |   |
| Export Potential <sup>3</sup>     | 25,600 | 26,200 | 26,900 | 27,500 | 28,200 | 28,800 | 29,500 | 30,100 | 30,800 | 31,400 |   |
| Surplus or Deficit<br>Balance     | -250   | 430    | 1,044  | 1,788  | 2,463  | 3,266  | 3,998  | 4,858  | 5,645  | 6,558  |   |

<sup>1</sup>Table A-1.1

<sup>2</sup>Table 13

<sup>3</sup>Table 36

Rice

Because of apparent difficulties in the historical data base for rice production and/or the historical data base for rice consumption in Paraguay, the deficit balances shown in Table 41 cannot be taken at face value. The current production and consumption figures indicate a substantial deficit also, but observation of the actual situation indicates a balance between production and consumption, or a slight positive surplus. Because the basic data are suspect, the trend of increasing deficits indicated by the figures on the last line of Table 30 may be suspect also. There is urgent need for more accurate data on domestic utilization patterns for rice, so that the market potentials can be quantified and projected accurately.

To the extent that the figures can be relied upon, there appears to be domestic market potential for expanded rice production in the years ahead. Likewise the long range outlook indicates a potential export market for rice, particularly to other Latin American countries.

TABLE 41  
 PROJECTED SUPPLY AND UTILIZATION OF ROUGH RICE, 1976 - 1985  
 Metric Tons

|  | 1976    | 1977    | 1978    | 1979    | 1980    | 1981    | 1982    | 1983    | 1984    | 1985    |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Projected Production <sup>1</sup>          | 59,345  | 62,410  | 65,474  | 68,539  | 71,604  | 74,669  | 77,734  | 80,799  | 83,864  | 86,929  |
| Less                                       |         |         |         |         |         |         |         |         |         |         |
| Loss <sup>2</sup>                          | 5,935   | 6,241   | 6,548   | 6,854   | 7,160   | 7,467   | 7,773   | 8,080   | 8,386   | 8,693   |
| Seed Requirement <sup>3</sup>              | 5,523   | 5,932   | 6,375   | 6,818   | 7,262   | 7,722   | 8,182   | 8,659   | 9,154   | 9,677   |
| Net Production                             | 47,887  | 50,237  | 52,551  | 54,867  | 57,182  | 59,480  | 61,779  | 64,060  | 66,324  | 68,559  |
| Domestic Consumption <sup>4</sup>          | 63,026  | 65,874  | 68,849  | 71,972  | 75,234  | 78,643  | 82,197  | 85,908  | 89,765  | 93,777  |
| Surplus or Deficit<br>Balance <sup>5</sup> | -15,139 | -15,637 | -16,298 | -17,105 | -18,052 | -19,163 | -20,418 | -21,848 | -23,441 | -25,218 |

<sup>1</sup>Table A-1.1

<sup>2</sup>Table 14

<sup>3</sup>Table A-2.1, 170.46 Kg/ha

<sup>4</sup>Table 30, Rough Rice equivalent base on 65 percent milling conversion

<sup>5</sup>The only conclusive result of this forecast is the difference between production and consumption, illustrating that either one or both data bases are in error.

Wheat

In contrast to the other major crops, the projections based on past trends indicate that Paraguay must expect continuing large deficits of wheat (Table 42). The absolute deficit is growing each year, and is projected to surpass 100,000 metric tons by 1982-83. In percentage terms, however, the projections indicate a slight improvement. The projected self-sufficiency ratio increases from about 25 percent in 1976 to 27 percent in 1985.

The major efforts in the past to achieve substantially higher levels of wheat production in Paraguay have not met with success. Until major breakthroughs are achieved in developing adapted and pest-resistant, high-yielding varieties, wheat is likely to remain a supplemental crop rather than the dominant crop for the small Paraguay farmer. Even though domestic market potentials are good, other crops have a comparative advantage over wheat under existing patterns of production technology and relative prices received by producers.

TABLE 42  
PROJECTED SUPPLY AND UTILIZATION OF WHEAT, 1976 - 1985

|                                    | Metric Tons |         |         |         |         |         |         |          |          |          |
|------------------------------------|-------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
|                                    | 1976        | 1977    | 1978    | 1979    | 1980    | 1981    | 1982    | 1983     | 1984     | 1985     |
| Projected Production <sup>1</sup>  | 38,864      | 40,421  | 41,921  | 43,369  | 44,770  | 46,127  | 47,444  | 48,724   | 49,969   | 51,182   |
| Less                               |             |         |         |         |         |         |         |          |          |          |
| Loss <sup>2</sup>                  | 3,886       | 4,042   | 4,192   | 4,337   | 4,477   | 4,613   | 4,744   | 4,872    | 4,997    | 5,118    |
| Seed Requirement <sup>3</sup>      | 4,561       | 4,796   | 5,021   | 5,246   | 5,461   | 5,686   | 5,901   | 6,116    | 6,331    | 6,553    |
| Net Production                     | 30,417      | 31,583  | 32,708  | 33,786  | 34,832  | 35,828  | 36,799  | 37,736   | 38,641   | 39,511   |
| Projected Consumption <sup>4</sup> | 120,113     | 122,608 | 125,164 | 127,788 | 130,467 | 133,199 | 135,978 | 138,803  | 141,654  | 144,538  |
| Surplus or Deficit<br>Balance      | -89,696     | -91,025 | -92,456 | -94,002 | -95,635 | -97,371 | -99,179 | -101,067 | -103,013 | -105,027 |

<sup>1</sup>Table A-1.1

<sup>2</sup>Table 10

<sup>3</sup>Table A-2.1, 102.27 Kg/ha

<sup>4</sup>Table 30, based on milling rate of .76

## APPENDIX A

- Table A 6.0 Production 1962-1974, with projections to 1985, tons, corn.
- Table A 6.1 Hectares harvested 1962-1974, with projections to 1985, 100 hectares, corn.
- Table A 6.2 Yield per hectare 1962-1974, with projections to 1985, kilograms, corn.
- Table A 101 Production 1962-1974, with projections to 1990, Paraguay, tons
- Table A 104 Hectares harvested 1962-1974, with projections to 1985, Paraguay, 100 hectares.
- Table A 1.1 Production 1962-1974, with projections to 1985, final projections, tons.
- Table A 1 Production 1962-1974, with projections to 1985, preliminary projections, tons.
- Table A 41 Production 1962-1974, with projections to 1985, tons, maiz.
- Table A 2 Hectares harvested 1962-1974, with projections to 1985, 100 hectares, preliminary projections.
- Table A 2.1 Hectares harvested 1962-1974, with projections to 1985, 100 hectares, final projections.
- Table A 42 Hectares harvested 1962-1974, with projections to 1985, 100 hectares, corn.
- Table A 3 Required minimum yield to achieve production levels 1975-1985, national average by crop, kilos per hectare.

CUADRO 3-8.3  
 PRODUCCION 1962-1974, CON PROYECCIONES HASTA 1985

TONELADAS

EXPERIMENT IS 1.40

MAIZ

| AÑO  |   | CONCEPCION | SAN PEDRO | CORDOBA  | ULIPA    | GAAGUAZU | CAAZAPA  | ITAPIA   | MISIONES | PARAGUARI |
|------|---|------------|-----------|----------|----------|----------|----------|----------|----------|-----------|
| 1962 | O | 4300       | 5800      | 13300    | 6900     | 9200     | 12400    | 29100    | 3200     | 16200     |
| 1963 | O | 7000       | 6800      | 15400    | 7300     | 9500     | 13700    | 19500    | 3300     | 15600     |
| 1964 | O | 10100      | 10400     | 23400    | 16200    | 14500    | 15700    | 24400    | 9800     | 41200     |
| 1965 | O | 12500      | 16000     | 21300    | 14200    | 19400    | 16500    | 37000    | 7000     | 34800     |
| 1966 | O | 5700       | 16800     | 15300    | 15000    | 17200    | 11500    | 23500    | 6700     | 24600     |
| 1967 | O | 9300       | 17100     | 26500    | 17700    | 25000    | 15900    | 25300    | 11400    | 43600     |
| 1968 | O | 7700       | 11900     | 19200    | 13900    | 13500    | 13000    | 24200    | 9600     | 35400     |
| 1969 | O | 4600       | 5900      | 15400    | 3400     | 20600    | 11200    | 27300    | 7700     | 32500     |
| 1970 | O | 10574      | 20323     | 14333    | 17849    | 25478    | 14938    | 61306    | 12779    | 29726     |
| 1971 | O | 3541       | 14869     | 14055    | 16155    | 24346    | 13627    | 57776    | 8731     | 29755     |
| 1972 | C | 10524      | 20718     | 16380    | 15027    | 22929    | 9030     | 40502    | 5919     | 29274     |
| 1973 | C | 12103      | 23524     | 12437    | 20075    | 24575    | 15226    | 46726    | 13570    | 32659     |
| 1974 | O | 13700      | 26320     | 15160    | 19052    | 31833    | 15303    | 48134    | 12822    | 36379     |
| 1975 | O | 12640      | 24483     | 14127    | 20392    | 31941    | 13669    | 54940    | 12141    | 30361     |
| 1976 | O | 13013      | 26923     | 15463    | 21062    | 33834    | 13673    | 56305    | 12775    | 37279     |
| 1977 | C | 13502      | 26916     | 16740    | 22058    | 35982    | 13672    | 61760    | 13426    | 38221     |
| 1978 | O | 14205      | 32900     | 12031    | 23079    | 35081    | 13672    | 65304    | 14094    | 39147     |
| 1979 | O | 14823      | 35052     | 11365    | 24125    | 40231    | 13674    | 68531    | 14777    | 40177     |
| 1980 | O | 15455      | 37151     | 10663    | 25194    | 42423    | 13675    | 72640    | 15476    | 41183     |
| 1981 | C | 16100      | 39375     | 9885     | 26285    | 44573    | 13676    | 76428    | 16180    | 42221     |
| 1982 | O | 16755      | 41604     | 9122     | 27395    | 46662    | 13677    | 80293    | 16913    | 43275     |
| 1983 | O | 17429      | 43876     | 8344     | 28535    | 48256    | 13678    | 84232    | 17661    | 44349     |
| 1984 | C | 18113      | 46139     | 7553     | 29691    | 51673    | 13680    | 88243    | 18417    | 45443     |
| 1985 | C | 18808      | 48543     | 6767     | 30857    | 54091    | 13681    | 92325    | 19186    | 46556     |
| YPA  |   | 9110.92    | 15708.77  | 17935.77 | 14455.30 | 20353.46 | 13563.32 | 35391.84 | 8457.00  | 31030.23  |
| P    |   | 140.46     | 475.62    | -162.00  | 237.58   | 485.82   | 0.20     | 324.60   | 155.41   | 224.90    |
| ESC  |   | 0.2727     | 0.5881    | 0.2478   | 0.4056   | 0.7474   | 0.3300   | 0.3065   | 0.3411   | 0.1015    |
| SYX  |   | 2791.83    | 3767.83   | 3453.05  | 3501.92  | 3455.67  | 2300.04  | 9907.64  | 2623.96  | 3143.23   |
| SE   |   | 69.16      | 94.08     | 85.56    | 86.75    | 85.61    | 56.58    | 245.44   | 65.13    | 201.73    |

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
 FUENTE: ENCUESTA AGRICOLA POR MUESTREO, 1970, 71, 72, 73, 74

CLASES A-G.D  
 PRODUCCION 1962-1974, C.V. PRODUCTIVIDADES HASTA 1985  
 TONELAJES

EXPOSICION IS 1.4C

MAIZ

| AÑO  | AL PARVA | CENTRAL | NEEMBUCU | APABAY | CHACC | TOTAL |
|------|----------|---------|----------|--------|-------|-------|
| 1962 | 0        | 400     | 10500    | 3100   | 2600  | 16500 |
| 1963 | 0        | 400     | 9400     | 6000   | 2400  | 11100 |
| 1964 | 0        | 3000    | 17100    | 13200  | 3700  | 5000  |
| 1965 | 0        | 2600    | 12600    | 13300  | 5800  | 12000 |
| 1966 | 0        | 4200    | 13400    | 6300   | 6300  | 14000 |
| 1967 | 0        | 5900    | 11600    | 8700   | 6200  | 28000 |
| 1968 | 0        | 5200    | 7500     | 8000   | 4000  | 21000 |
| 1969 | 0        | 3400    | 5000     | 2000   | 2500  | 7000  |
| 1970 | 0        | 14127   | 8075     | 11672  | 5642  | 32700 |
| 1971 | 0        | 20366   | 5080     | 5343   | 10162 | 48000 |
| 1972 | 0        | 11456   | 5816     | 5216   | 5200  | 6500  |
| 1973 | 0        | 17811   | 8553     | 11950  | 7028  | 5700  |
| 1974 | 0        | 30502   | 7227     | 10542  | 6622  | 7100  |
| 1975 | 0        | 25521   | 4827     | 11463  | 10625 | 4000  |
| 1976 | 0        | 29358   | 4075     | 11990  | 11415 | 36700 |
| 1977 | 0        | 32354   | 3201     | 12531  | 1722  | 27100 |
| 1978 | 0        | 35383   | 2509     | 13036  | 13045 | 17000 |
| 1979 | 0        | 33486   | 1657     | 13654  | 13456 | 7000  |
| 1980 | 0        | 41657   | 507      | 14235  | 14753 | 0     |
| 1981 | 0        | 44857   | 19       | 14825  | 15647 | 0     |
| 1982 | 0        | 44202   | 0        | 15434  | 16545 | 0     |
| 1983 | 0        | 51570   | 0        | 16051  | 17406 | 0     |
| 1984 | 0        | 55000   | 0        | 16679  | 18406 | 0     |
| 1985 | 0        | 55451   | 0        | 17318  | 19355 | 0     |

| YEAR  | 1962-77 | 1978-85 | 1986-91 | 1992-97 | TOTAL   |
|-------|---------|---------|---------|---------|---------|
| PROD  | 5204.77 | 9201.54 | 8401.77 | 6064.77 | 1004.23 |
| EXP   | 705.22  | -144.53 | 127.16  | 192.57  | -22.52  |
| NET   | 4499.55 | 9346.07 | 8528.61 | 5872.20 | 981.71  |
| AVG   | 4562.43 | 2639.43 | 2596.74 | 1935.70 | 595.80  |
| STDEV | 113.02  | 65.35   | 64.33   | 47.95   | 14.71   |

SOURCE: MANUAL ESTADISTICO DEL PARAGUAY, 1967-1989, SEC. DE CUANTIFICACION TECNICA  
 ENCUESTA AGRICOLA POR MUESTREO, 1970, 71, 72, 73, 74

CLADRC A-6.1  
HECTARIAS CCSECHADAS 1962-1974, CON PROYECCIONES HASTA 1985

100 HECTARIAS

EXPOENENT IS 1.00

MAIZ

| ANO  |   | CONCEPCION | SAN PEDRO | CORDOERA | GUIRA | GAAGUAZU | GAZAPA | ITAPUA | MISIONES | PARAGUARI |
|------|---|------------|-----------|----------|-------|----------|--------|--------|----------|-----------|
| 1962 | C | 36         | 47        | 123      | 46    | 77       | 82     | 200    | 46       | 126       |
| 1963 | C | 40         | 48        | 136      | 48    | 69       | 88     | 191    | 47       | 126       |
| 1964 | O | 65         | 87        | 167      | 109   | 121      | 108    | 233    | 98       | 345       |
| 1965 | C | 68         | 89        | 170      | 110   | 131      | 110    | 235    | 94       | 347       |
| 1966 | C | 57         | 99        | 153      | 113   | 142      | 96     | 206    | 85       | 306       |
| 1967 | C | 73         | 109       | 184      | 135   | 167      | 116    | 227    | 93       | 337       |
| 1968 | O | 76         | 119       | 180      | 138   | 188      | 121    | 241    | 96       | 357       |
| 1969 | C | 43         | 84        | 118      | 98    | 172      | 92     | 209    | 80       | 245       |
| 1970 | C | 50         | 124       | 145      | 140   | 182      | 98     | 329    | 122      | 286       |
| 1971 | O | 79         | 117       | 159      | 146   | 202      | 106    | 311    | 103      | 307       |
| 1972 | O | 83         | 171       | 156      | 128   | 193      | 54     | 313    | 89       | 296       |
| 1973 | O | 95         | 142       | 142      | 135   | 215      | 104    | 306    | 82       | 301       |
| 1974 | O | 98         | 160       | 161      | 145   | 254      | 119    | 317    | 102      | 312       |
| 1975 | C | 100        | 169       | 157      | 162   | 254      | 111    | 334    | 110      | 343       |
| 1976 | C | 104        | 177       | 158      | 169   | 267      | 112    | 345    | 113      | 352       |
| 1977 | O | 108        | 186       | 158      | 176   | 280      | 113    | 357    | 116      | 360       |
| 1978 | O | 113        | 195       | 159      | 182   | 293      | 114    | 368    | 119      | 369       |
| 1979 | O | 117        | 204       | 159      | 195   | 306      | 116    | 379    | 123      | 377       |
| 1980 | O | 121        | 212       | 160      | 196   | 319      | 117    | 391    | 126      | 386       |
| 1981 | O | 126        | 221       | 160      | 203   | 332      | 118    | 402    | 129      | 394       |
| 1982 | O | 130        | 230       | 161      | 209   | 345      | 119    | 413    | 132      | 403       |
| 1983 | C | 134        | 239       | 162      | 216   | 359      | 120    | 424    | 136      | 411       |
| 1984 | O | 139        | 247       | 162      | 223   | 372      | 121    | 436    | 139      | 420       |
| 1985 | O | 143        | 256       | 163      | 230   | 385      | 123    | 447    | 142      | 428       |

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|      |        |        |        |        |        |        |        |        |        |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| YEAR | 69.46  | 107.38 | 153.38 | 114.69 | 162.54 | 102.62 | 255.23 | 87.08  | 283.92 |
| R    | 4.33   | 8.75   | 0.54   | 6.76   | 13.07  | 1.18   | 11.28  | 3.23   | 8.48   |
| FSC  | 0.6712 | 0.8171 | 0.0110 | 0.6118 | 0.9153 | 0.1415 | 0.7255 | 0.3286 | 0.1882 |
| SYX  | 12.33  | 16.84  | 20.55  | 21.90  | 16.17  | 11.76  | 28.23  | 18.78  | 71.62  |
| SR   | 0.91   | 1.25   | 1.55   | 1.62   | 1.20   | 0.87   | 2.09   | 1.39   | 5.31   |

MANUAL ESTADISTICO DEL PARAQUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

SOURCE:

CUADRO A-6.1  
HECTARIAS CCSECHADAS 1962-1974, CEN PROYECCIONES HASTA 1985

100 HECTARIAS

EXPOENENT IS 1.00

MAIZ

| ANO  |   | AL PARANA | CENTRAL | NEEMBUCU | AMABAY | CHACC  | TOTAL |
|------|---|-----------|---------|----------|--------|--------|-------|
| 1962 | C | 8         | 94      | 34       | 22     | 8      |       |
| 1963 | C | 9         | 84      | 50       | 20     | 9      |       |
| 1964 | C | 25        | 114     | 85       | 22     | 5      |       |
| 1965 | C | 26        | 116     | 86       | 23     | 9      |       |
| 1966 | C | 33        | 104     | 65       | 32     | 12     |       |
| 1967 | C | 46        | 115     | 77       | 35     | 18     |       |
| 1968 | O | 51        | 95      | 75       | 40     | 23     |       |
| 1969 | C | 26        | 59      | 25       | 19     | 5      |       |
| 1970 | O | 57        | 82      | 113      | 61     | 5      |       |
| 1971 | O | 101       | 36      | 111      | 67     | 6      |       |
| 1972 | C | 76        | 67      | 118      | 55     | 5      |       |
| 1973 | C | 90        | 82      | 99       | 57     | 5      |       |
| 1974 | C | 123       | 80      | 105      | 63     | 7      |       |
| 1975 | O | 121       | 72      | 116      | 70     | 7      |       |
| 1976 | C | 130       | 70      | 121      | 74     | 6      |       |
| 1977 | C | 139       | 67      | 126      | 78     | 6      |       |
| 1978 | C | 148       | 65      | 131      | 92     | 5      |       |
| 1979 | C | 158       | 62      | 136      | 86     | 5      |       |
| 1980 | C | 167       | 59      | 141      | 91     | 5      |       |
| 1981 | C | 176       | 57      | 146      | 95     | 4      |       |
| 1982 | O | 186       | 54      | 151      | 99     | 4      |       |
| 1983 | C | 195       | 52      | 155      | 103    | 3      |       |
| 1984 | O | 204       | 49      | 161      | 108    | 3      |       |
| 1985 | O | 214       | 47      | 166      | 112    | 3      |       |
| YEAR |   | 55.46     | 90.62   | 80.23    | 40.08  | 9.38   |       |
| B    |   | 9.30      | -2.59   | 5.07     | 4.21   | -0.40  |       |
| FSC  |   | 0.9229    | 0.3156  | 0.4309   | 0.7457 | 0.0825 |       |
| SYX  |   | 17.54     | 15.54   | 23.68    | 10.01  | 5.44   |       |
| SB   |   | 1.30      | 1.15    | 1.76     | 0.74   | 0.40   |       |

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SOURCE: MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO A-8.2  
RENDIMIENTO POR HECTÁREA 1962-1974, CON PROYECCIONES HASTA 1990

KILCOGRAMS

EXPOSURE IS 1.00

MAIZ

| YEAR | CONCEPCION | SAN PEDRO | CORDOBA | GUIRA   | GAAGUAZU | GAAZAPA | ITAPUA  | MISIONES | PARAGUARI |      |
|------|------------|-----------|---------|---------|----------|---------|---------|----------|-----------|------|
| 1962 | 5          | 1194      | 1234    | 1483    | 1500     | 1195    | 1512    | 1455     | 696       | 1286 |
| 1963 | 0          | 1750      | 1417    | 1353    | 1521     | 1376    | 1500    | 958      | 786       | 1318 |
| 1964 | 0          | 1554      | 1195    | 1421    | 1495     | 1153    | 1407    | 1243     | 1000      | 1194 |
| 1965 | 0          | 2003      | 1709    | 1253    | 1300     | 1456    | 1500    | 1545     | 830       | 957  |
| 1966 | 0          | 1000      | 1697    | 1000    | 1327     | 1211    | 1198    | 1141     | 788       | 804  |
| 1967 | 0          | 1274      | 1569    | 1440    | 1311     | 1497    | 1371    | 1049     | 1226      | 1294 |
| 1968 | 0          | 1013      | 1000    | 1011    | 1007     | 1005    | 1074    | 1004     | 1000      | 1003 |
| 1969 | 0          | 1070      | 1179    | 1305    | 857      | 1198    | 1217    | 1306     | 963       | 1327 |
| 1970 | 0          | 1209      | 1667    | 1027    | 1275     | 1457    | 1524    | 1379     | 1007      | 1039 |
| 1971 | 0          | 1134      | 1270    | 389     | 1107     | 1207    | 1282    | 1727     | 852       | 958  |
| 1972 | 0          | 1259      | 1347    | 1050    | 1174     | 1198    | 966     | 1294     | 665       | 989  |
| 1973 | 0          | 1274      | 1699    | 954     | 1487     | 1143    | 1464    | 1527     | 1289      | 1095 |
| 1974 | 0          | 1398      | 1645    | 1128    | 1314     | 1252    | 1328    | 1520     | 1264      | 1192 |
| 1975 | 0          | 1134      | 1540    | 918     | 1140     | 1204    | 1711    | 1574     | 1137      | 1030 |
| 1976 | 0          | 1112      | 1555    | 891     | 1120     | 1156    | 1193    | 1605     | 1163      | 1018 |
| 1977 | 0          | 1087      | 1569    | 844     | 1099     | 1198    | 1176    | 1635     | 1190      | 1006 |
| 1978 | 0          | 1051      | 1583    | 807     | 1079     | 1179    | 1158    | 1666     | 1216      | 954  |
| 1979 | 0          | 1035      | 1597    | 770     | 1059     | 1171    | 1140    | 1697     | 1243      | 982  |
| 1980 | 0          | 1000      | 1611    | 733     | 1038     | 1162    | 1123    | 1727     | 1269      | 970  |
| 1981 | 0          | 984       | 1625    | 696     | 1018     | 1154    | 1105    | 1758     | 1296      | 958  |
| 1982 | 0          | 958       | 1639    | 659     | 998      | 1146    | 1083    | 1788     | 1322      | 946  |
| 1983 | 0          | 932       | 1653    | 622     | 977      | 1137    | 1070    | 1819     | 1349      | 934  |
| 1984 | 0          | 906       | 1667    | 585     | 957      | 1129    | 1052    | 1849     | 1375      | 922  |
| 1985 | 0          | 881       | 1681    | 548     | 936      | 1120    | 1035    | 1880     | 1402      | 909  |
| 1986 | 0          | 855       | 1695    | 511     | 916      | 1112    | 1017    | 1910     | 1428      | 897  |
| 1987 | 0          | 829       | 1709    | 474     | 896      | 1104    | 1000    | 1941     | 1455      | 885  |
| 1988 | 0          | 803       | 1723    | 437     | 875      | 1095    | 982     | 1971     | 1481      | 873  |
| 1989 | 0          | 778       | 1737    | 400     | 855      | 1087    | 964     | 2002     | 1508      | 861  |
| 1990 | 0          | 752       | 1751    | 363     | 835      | 1078    | 947     | 2032     | 1534      | 849  |
| YEAR | 1313.23    | 1442.15   | 1176.85 | 1282.69 | 1263.28  | 1334.08 | 1360.62 | 951.23   | 1114.31   |      |

|     |        |        |        |        |        |        |        |        |        |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| B   | -25.75 | 14.05  | -32.00 | -20.37 | -8.41  | -17.60 | 30.54  | 26.51  | -12.05 |
| PS2 | 0.1163 | 0.0471 | 0.4902 | 0.1526 | 0.0486 | 0.1467 | 0.1792 | 0.2454 | 0.0812 |
| SYX | 252.65 | 257.13 | 151.59 | 195.25 | 151.41 | 172.69 | 265.92 | 189.04 | 164.89 |
| SA  | 21.40  | 19.06  | 11.24  | 14.47  | 11.22  | 12.80  | 19.70  | 14.01  | 12.22  |

SOURCE:

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO A-101  
 PRODUCCION 1962-1974, CON PROYECCIONES HASTA 1990

*RAN*

PARAGUAY

EXPOWENT IS 0.40

TONELADAS

| AÑO  | CANA AZUCAR |                    |         |          | ARROZ  |        |       |            |        |
|------|-------------|--------------------|---------|----------|--------|--------|-------|------------|--------|
|      | PARA        | AZ. Y. ML.         | ALGODON | PERCUTOS | TABACO | MAIZ   | TRIGO | EN CASCAKA | SOJA   |
| 1962 | 0           | 672000             | 32500   | 17500    | 16000  | 123400 | 7200  | 16000      | 2900   |
| 1963 | 0           | 700000             | 40000   | 19000    | 25000  | 120100 | 7000  | 16000      | 7700   |
| 1964 | 0           | 764100             | 35800   | 23700    | 12000  | 200000 | 9170  | 20000      | 10000  |
| 1965 | 0           | 991700             | 42000   | 36301    | 14000  | 100000 | 7040  | 21600      | 18000  |
| 1966 | 0           | 987500             | 28900   | 19320    | 8750   | 169400 | 7200  | 10100      | 20000  |
| 1967 | 0           | 921900             | 24700   | 22540    | 13500  | 225000 | 9160  | 18170      | 16000  |
| 1968 | 0           | 702000             | 30100   | 18000    | 22000  | 180000 | 20000 | 20800      | 13400  |
| 1969 | 0           | 821300             | 40500   | 17400    | 24000  | 151000 | 31376 | 27160      | 22000  |
| 1970 | 0           | 1413042            | 31617   | 34866    | 17723  | 258703 | 47650 | 45212      | 52065  |
| 1971 | 0           | 1407377            | 17495   | 25005    | 18215  | 229786 | 54811 | 38807      | 75132  |
| 1972 | 0           | 1044533            | 52938   | 32116    | 23496  | 209204 | 17683 | 43743      | 97051  |
| 1973 | 0           | 1100764            | 65241   | 34186    | 26750  | 240075 | 23000 | 41734      | 122637 |
| 1974 | 0           | <del>1202162</del> | 89696   | 42413    | 32411  | 231595 | 35245 | 50038      | 181260 |
| 1975 | 0           | 1231724            | 58532   | 33575    | 24559  | 254630 | 37243 | 44290      | 110755 |
| 1976 | 0           | 1255263            | 60090   | 34304    | 25039  | 260969 | 38864 | 45891      | 117002 |
| 1977 | 0           | 1277887            | 61596   | 35005    | 25500  | 267060 | 40421 | 47428      | 123004 |
| 1978 | 0           | 1299673            | 63027   | 35679    | 25744  | 272925 | 41921 | 48909      | 124785 |
| 1979 | 0           | 1320703            | 64413   | 36331    | 26372  | 278584 | 43389 | 50339      | 134364 |
| 1980 | 0           | 1341044            | 65763   | 36950    | 26786  | 284064 | 44770 | 51721      | 137761 |
| 1981 | 0           | 1360751            | 67067   | 37571    | 27188  | 289371 | 46127 | 53061      | 144990 |
| 1982 | 0           | 1379876            | 68332   | 38163    | 27577  | 294520 | 47444 | 54361      | 150065 |
| 1983 | 0           | 1398462            | 69561   | 38739    | 27956  | 299524 | 48724 | 55624      | 154996 |
| 1984 | 0           | 1416547            | 70757   | 39299    | 28324  | 304374 | 49969 | 56853      | 159795 |
| 1985 | 0           | <u>1434167</u>     | 71923   | 39844    | 28683  | 309138 | 51182 | 58051      | 164470 |
| 1986 | 0           | 1451351            | 73059   | 40375    | 29033  | 313765 | 52365 | 59219      | 169030 |
| 1987 | 0           | 1469128            | 74169   | 40896    | 29375  | 318282 | 53521 | 60360      | 173481 |
| 1988 | 0           | 1484522            | 75253   | 41403    | 29709  | 322695 | 54649 | 61474      | 177831 |
| 1989 | 0           | 1500556            | 76314   | 41900    | 30036  | 327013 | 55793 | 62564      | 182085 |
| 1990 | 0           | 1516249            | 77352   | 42386    | 30356  | 331238 | 56834 | 63631      | 186249 |

*Separación*

*Suma*

*594000*

97051 - 922 493 = 62040 6

122637 - 66327 = 42437 39

181260 - 75828 = 44034 37

75132 - 972 640 = 434737 31%

YBAR 999762.88 43190.69 26392.84 19834.46 152180.19 21271.52 28524.54 49213.61

|     |           |          |         |         |          |          |          |          |
|-----|-----------|----------|---------|---------|----------|----------|----------|----------|
| B   | 292783.74 | 19365.13 | 9006.46 | 5964.37 | 76831.75 | 20160.07 | 19901.51 | 77685.19 |
| RSQ | 0.4445    | 0.2502   | 0.3489  | 0.2538  | 0.5866   | 0.4645   | 0.6634   | 0.6177   |
| SYX | 189433.75 | 19423.13 | 7207.52 | 5925.79 | 38346.20 | 12541.01 | 8214.25  | 35392.12 |
| Sb  | 98606.19  | 10107.41 | 3750.81 | 3093.66 | 19754.60 | 6526.09  | 4274.53  | 18417.36 |

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SOURCE:

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO 4-101  
 PRODUCCION 1962-1974, CON PROYECCIONES HASTA 1990

PARAQUAY

EXPOJENT IS 0.60

TONELADAS

| AÑO  | CANAS AZUCAR |          |          | ARROZ    |           |          |          |            |        |
|------|--------------|----------|----------|----------|-----------|----------|----------|------------|--------|
|      | PARA         | AZ.Y.ML. | ALGODON  | PERCTOS  | TABACO    | MAIZ     | TRIGO    | EN CASCARA | SOJA   |
| 1962 | 0            | 672000   | 22500    | 17600    | 16000     | 123400   | 7200     | 16800      | 2900   |
| 1963 | 0            | 700000   | 40000    | 19000    | 25000     | 120100   | 7000     | 16000      | 7200   |
| 1964 | 0            | 964100   | 35800    | 23700    | 12000     | 205000   | 9170     | 20000      | 10000  |
| 1965 | 0            | 991700   | 42000    | 36301    | 18000     | 100000   | 7040     | 21600      | 18000  |
| 1966 | 0            | 987500   | 26900    | 19320    | 8750      | 165400   | 7200     | 10100      | 20000  |
| 1967 | 0            | 987900   | 26700    | 22540    | 13500     | 225000   | 9160     | 18170      | 18000  |
| 1968 | 0            | 702000   | 30100    | 18000    | 22000     | 130000   | 20000    | 20800      | 13500  |
| 1969 | 0            | 821300   | 40500    | 17460    | 24000     | 153000   | 31376    | 27150      | 22000  |
| 1970 | 0            | 1413042  | 29617    | 34866    | 17723     | 258703   | 47650    | 45218      | 52065  |
| 1971 | 0            | 1407377  | 17485    | 25605    | 18218     | 229786   | 54611    | 38807      | 75132  |
| 1972 | 0            | 1044523  | 52938    | 32116    | 23476     | 209234   | 17683    | 43743      | 97081  |
| 1973 | 0            | 1100764  | 85241    | 34186    | 26750     | 246075   | 23000    | 41733      | 122637 |
| 1974 | 0            | 1207962  | 89696    | 42413    | 32411     | 281595   | 35245    | 50688      | 181262 |
| 1975 | 0            | 1251167  | 61012    | 34409    | 25310     | 260947   | 38824    | 46233      | 118498 |
| 1976 | 0            | 1280049  | 63059    | 35330    | 25933     | 268243   | 40640    | 48267      | 126904 |
| 1977 | 0            | 1308170  | 65053    | 36227    | 26551     | 276541   | 42804    | 50248      | 134699 |
| 1978 | 0            | 1335536  | 66997    | 37101    | 27148     | 284043   | 44718    | 52180      | 142301 |
| 1979 | 0            | 1362354  | 68876    | 37956    | 27732     | 291371   | 46589    | 54067      | 143727 |
| 1980 | 0            | 1388583  | 70754    | 38791    | 28302     | 298538   | 48418    | 55912      | 156989 |
| 1981 | 0            | 1414235  | 72572    | 39609    | 28861     | 305555   | 50209    | 57719      | 164100 |
| 1982 | 0            | 1439380  | 74355    | 40411    | 29409     | 312434   | 51905    | 59491      | 171070 |
| 1983 | 0            | 1464050  | 76104    | 41158    | 29946     | 319182   | 53687    | 61226      | 177909 |
| 1984 | 0            | 1488275  | 77821    | 41970    | 30474     | 325809   | 55379    | 62935      | 184624 |
| 1985 | 0            | 1512083  | 79507    | 42729    | 30992     | 332327   | 57041    | 64612      | 191224 |
| 1986 | 0            | 1535496  | 81169    | 43476    | 31502     | 338727   | 58676    | 66261      | 197714 |
| 1987 | 0            | 1558538  | 82802    | 44211    | 32004     | 345030   | 60284    | 67884      | 204101 |
| 1988 | 0            | 1581229  | 84411    | 44934    | 32498     | 351237   | 61869    | 69483      | 210391 |
| 1989 | 0            | 1603585  | 85976    | 45647    | 32985     | 357352   | 63430    | 71058      | 216583 |
| 1990 | 0            | 1625624  | 87558    | 46350    | 33465     | 363381   | 64968    | 72610      | 222697 |
| YRAR | 999782.86    | 43190.69 | 26392.34 | 19834.46 | 192180.19 | 21271.92 | 28524.54 | 49213.61   |        |

|     |           |          |         |         |          |          |         |          |
|-----|-----------|----------|---------|---------|----------|----------|---------|----------|
| B   | 140271.75 | 9744.23  | 4473.07 | 3055.08 | 38371.79 | 9793.80  | 9881.00 | 38381.39 |
| RSQ | 0.4422    | 0.2657   | 0.3656  | 0.2883  | 0.6012   | 0.4747   | 0.7081  | 0.6704   |
| SYX | 189548.28 | 18958.09 | 7103.64 | 5786.99 | 37633.25 | 12421.04 | 7649.02 | 32274.48 |
| SB  | 47500.91  | 4740.39  | 1776.43 | 1447.17 | 5411.02  | 3106.15  | 1912.81 | 3220.99  |

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SOURCE:

MANUAL ESTADISTICO DEL PARAQUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO A-101  
 PRODUCCION 1962-1974, CON PROYECCIONES HASTA 1990

PARAGUAY

EXPONENT IS 0.80

| AÑO  | TONELADAS               |          |          |          |           |            |                       |          |        |
|------|-------------------------|----------|----------|----------|-----------|------------|-----------------------|----------|--------|
|      | CAÑA AZÚCAR             |          |          | ARROZ    |           |            |                       |          |        |
|      | PARA AZ. Y. PL. ALGODON | PERCITOS | TABACO   | MAIZ     | TRIGO     | EN CASCARA | SOJA                  |          |        |
| 1962 | 0                       | 672000   | 32500    | 17600    | 16000     | 123400     | 7200                  | 16900    | 2900   |
| 1963 | 0                       | 700000   | 40000    | 19000    | 25000     | 120100     | 7000                  | 16000    | 7000   |
| 1964 | 0                       | 964100   | 35800    | 23700    | 12000     | 206000     | 9170                  | 20000    | 10000  |
| 1965 | 0                       | 991700   | 42002    | 36301    | 13000     | 100000     | 7040                  | 21600    | 18000  |
| 1966 | 0                       | 987500   | 28900    | 19320    | 3750      | 165400     | 7200                  | 10100    | 20000  |
| 1967 | 0                       | 987900   | 26700    | 22540    | 13500     | 225000     | 9160                  | 18170    | 18000  |
| 1968 | 0                       | 702000   | 30100    | 19000    | 22000     | 180000     | 20000                 | 20800    | 13500  |
| 1969 | 0                       | 821300   | 40500    | 17460    | 24000     | 150000     | 31376                 | 27160    | 22000  |
| 1970 | 0                       | 1415042  | 39617    | 34866    | 17723     | 258703     | 47650                 | 45216    | 52065  |
| 1971 | 0                       | 1407377  | 17485    | 25605    | 14218     | 229786     | 54811                 | 38807    | 75132  |
| 1972 | 0                       | 1044533  | 52938    | 32116    | 23496     | 205294     | 17683                 | 43743    | 97081  |
| 1973 | 0                       | 1100764  | 85241    | 34186    | 26750     | 246075     | 23000                 | 41733    | 122647 |
| 1974 | 0                       | 1202962  | 89696    | 42413    | 32411     | 281595     | 35245                 | 50688    | 161262 |
| 1975 | 0                       | 1267348  | 63597    | 35253    | 26076     | 267021     | 40285                 | 48138    | 127075 |
| 1976 | 0                       | 1304039  | 66224    | 36393    | 26879     | 276652     | 42732                 | 50662    | 137096 |
| 1977 | 0                       | 1338271  | 69815    | 37519    | 27672     | 286156     | 45146                 | 53152    | 146983 |
| 1978 | 0                       | 1372076  | 71374    | 38630    | 28455     | 295541     | 47531                 | 55617    | 156747 |
| 1979 | 0                       | 1405486  | 73703    | 39728    | 29228     | 304217     | 49887                 | 58043    | 166398 |
| 1980 | 0                       | 1435527  | 76405    | 40814    | 29934     | 313990     | 52218                 | 60447    | 175941 |
| 1981 | 0                       | 1471222  | 78880    | 41839    | 30751     | 323067     | 54524 <sup>1.80</sup> | 62826    | 185385 |
| 1982 | 0                       | 1503591  | 81330    | 42953    | 31500     | 332054     | 56807                 | 65121    | 194734 |
| 1983 | 0                       | 1535653  | 83757    | 44006    | 32242     | 340956     | 59068                 | 67514    | 203995 |
| 1984 | 0                       | 1567425  | 86163    | 45051    | 32978     | 349777     | 61309                 | 69825    | 213172 |
| 1985 | 0                       | 1598722  | 88547    | 46086    | 33707     | 358521     | 63531                 | 72117    | 222270 |
| 1986 | 0                       | 1630157  | 90912    | 47113    | 34431     | 367193     | 65734                 | 74390    | 231292 |
| 1987 | 0                       | 1661143  | 93257    | 48131    | 35148     | 375796     | 67920                 | 76644    | 240242 |
| 1988 | 0                       | 1691852  | 95585    | 49142    | 35860     | 384333     | 70038                 | 78881    | 247123 |
| 1989 | 0                       | 1722414  | 97896    | 50145    | 36567     | 392807     | 72241                 | 81102    | 257939 |
| 1990 | 0                       | 1752719  | 100190   | 51141    | 37269     | 401220     | 74379                 | 83307    | 266693 |
| YBAR | 999782.88               | 43190.69 | 26392.84 | 19834.46 | 192180.19 | 21271.92   | 28524.54              | 49213.61 |        |

|     |           |          |         |         |          |          |         |          |
|-----|-----------|----------|---------|---------|----------|----------|---------|----------|
| B   | 74025.56  | 5603.91  | 2433.15 | 1714.05 | 20551.05 | 5221.23  | 5335.93 | 21381.63 |
| PSQ | 0.4364    | 0.3215   | 0.3933  | 0.3215  | 0.6117   | 0.4781   | 0.7455  | 0.7183   |
| SYX | 190939.44 | 18477.11 | 7003.84 | 5650.14 | 37162.10 | 12381.38 | 7142.57 | 30393.08 |
| SE  | 25366.23  | 2454.68  | 930.46  | 750.62  | 4936.97  | 1644.86  | 948.89  | 4037.71  |

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SOURCE:

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO A-101  
 PRODUCCION 1962-1974, CON PROYECCIONES HASTA 1990

PARAGUAY

EXPOONENT IS 1.00

| AÑO  | TONELADAS   |          |          |          |           |          |          |            |        |
|------|-------------|----------|----------|----------|-----------|----------|----------|------------|--------|
|      | CAÑA AZUCAR |          |          |          | ARROZ     |          |          |            |        |
|      | PARA        | AZ.Y.ML. | ALGODON  | PERCITOS | TABACO    | MAIZ     | TRIGO    | EN CASCARA | SOJA   |
| 1962 | 0           | 672000   | 32500    | 17500    | 14000     | 123400   | 7200     | 16800      | 2900   |
| 1963 | 0           | 700000   | 40000    | 19000    | 25000     | 120100   | 7000     | 16000      | 7200   |
| 1964 | 0           | 964100   | 35800    | 23700    | 12000     | 206000   | 9170     | 20000      | 10000  |
| 1965 | 0           | 991700   | 42002    | 36301    | 18000     | 100000   | 7040     | 21600      | 18000  |
| 1966 | 0           | 987500   | 28900    | 19320    | 8750      | 169400   | 7200     | 10100      | 20000  |
| 1967 | 0           | 987900   | 26700    | 22540    | 13500     | 225000   | 9160     | 18170      | 18000  |
| 1968 | 0           | 702000   | 30100    | 18000    | 22000     | 180000   | 20000    | 20800      | 13500  |
| 1969 | 0           | 821300   | 40500    | 17480    | 24000     | 157000   | 31376    | 27160      | 22000  |
| 1970 | 0           | 1415042  | 39617    | 34866    | 17723     | 258703   | 47650    | 45218      | 52065  |
| 1971 | 0           | 1407377  | 17485    | 25005    | 18213     | 229786   | 54811    | 38807      | 75132  |
| 1972 | 0           | 1044533  | 52338    | 32116    | 23496     | 203284   | 17583    | 43747      | 97081  |
| 1973 | 0           | 1100764  | 95241    | 34186    | 26750     | 246075   | 23000    | 41733      | 122637 |
| 1974 | 0           | 1202962  | 89696    | 42413    | 32411     | 281595   | 35245    | 50688      | 181262 |
| 1975 | 0           | 1286200  | 66253    | 36100    | 26846     | 272802   | 41608    | 45979      | 135183 |
| 1976 | 0           | 1327117  | 69547    | 37497    | 27846     | 284317   | 44514    | 53044      | 147464 |
| 1977 | 0           | 1368033  | 72642    | 38874    | 28849     | 295836   | 47419    | 56109      | 159746 |
| 1978 | 0           | 1408950  | 76137    | 40261    | 29851     | 307354   | 50324    | 59173      | 172027 |
| 1979 | 0           | 1441867  | 79431    | 41647    | 30853     | 318871   | 53229    | 62238      | 184308 |
| 1980 | 0           | 1490783  | 82726    | 43034    | 31754     | 330388   | 56134    | 65303      | 196590 |
| 1981 | 0           | 1531700  | 86020    | 44421    | 32856     | 341906   | 59040    | 68368      | 208871 |
| 1982 | 0           | 1572617  | 89315    | 45808    | 33857     | 353423   | 61945    | 71433      | 221152 |
| 1983 | 0           | 1613524  | 92609    | 47155    | 34859     | 364940   | 64850    | 74498      | 233434 |
| 1984 | 0           | 1654450  | 95904    | 48581    | 35861     | 376458   | 67755    | 77563      | 245715 |
| 1985 | 0           | 1695367  | 99199    | 49968    | 36862     | 387975   | 70661    | 80628      | 257996 |
| 1986 | 0           | 1736284  | 102493   | 51355    | 37864     | 399492   | 73566    | 83693      | 270278 |
| 1987 | 0           | 1777200  | 105788   | 52742    | 38866     | 411010   | 76471    | 86757      | 282559 |
| 1988 | 0           | 1817117  | 109082   | 54128    | 39867     | 422527   | 79376    | 89822      | 294840 |
| 1989 | 0           | 1857034  | 112377   | 55515    | 40869     | 434044   | 82281    | 92887      | 307122 |
| 1990 | 0           | 1899951  | 115672   | 56902    | 41871     | 445562   | 85187    | 95952      | 319403 |
| YEAR | 999782.88   | 43190.69 | 26392.84 | 19834.46 | 192180.19 | 21271.52 | 28524.54 | 49213.61   |        |

|     |           |          |         |         |          |          |         |          |
|-----|-----------|----------|---------|---------|----------|----------|---------|----------|
| B   | 40916.72  | 3294.58  | 1386.78 | 1001.64 | 11517.33 | 2905.21  | 3064.89 | 12281.33 |
| RSQ | 0.4282    | 0.3569   | 0.4000  | 0.3528  | 0.6171   | 0.4754   | 0.7754  | 0.7612   |
| SYX | 192311.88 | 17938.14 | 6909.59 | 5518.84 | 36904.60 | 12412.55 | 6709.59 | 27982.93 |
| S8  | 14255.09  | 1333.37  | 512.10  | 409.08  | 2735.55  | 920.08   | 497.35  | 2074.23  |

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SCURCE:

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO A-101  
 PRODUCCION 1962-1974, CON PROYECCIONES HASTA 1990

PARAGUAY

EXPONENT IS 1.20

| AÑO  | TONELADAS   |          |          |          |           |                        |          |            |        |
|------|-------------|----------|----------|----------|-----------|------------------------|----------|------------|--------|
|      | CAÑA AZÚCAR |          |          |          | ARROZ     |                        |          |            |        |
|      | PARA        | AZ.Y.ML. | ALGODÓN  | POROTOS  | TABACO    | MAIZ                   | TRIGO    | EN CASCARA | SOJA   |
| 1962 | 0           | 672000   | 32500    | 17600    | 16000     | 123400                 | 7200     | 16800      | 2900   |
| 1963 | 0           | 709000   | 40000    | 19000    | 25000     | 120100                 | 7000     | 16000      | 7000   |
| 1964 | 0           | 964100   | 35800    | 23700    | 12000     | 206000                 | 9170     | 20000      | 10000  |
| 1965 | 0           | 991700   | 42002    | 36301    | 13000     | 100000                 | 7040     | 21600      | 18000  |
| 1966 | 0           | 987500   | 28900    | 19320    | 8750      | 165400                 | 7200     | 10100      | 20000  |
| 1967 | 0           | 967900   | 26700    | 22540    | 13500     | 225000                 | 9160     | 18170      | 18000  |
| 1968 | 0           | 702000   | 30100    | 18000    | 22000     | 180000                 | 20000    | 20000      | 13500  |
| 1969 | 0           | 821300   | 40500    | 17460    | 24000     | 153000                 | 31376    | 27160      | 22000  |
| 1970 | 0           | 1415042  | 39617    | 34866    | 17723     | 258703                 | 47650    | 45218      | 52065  |
| 1971 | 0           | 1407377  | 17485    | 25605    | 18218     | 229786                 | 54611    | 38807      | 75132  |
| 1972 | 0           | 1044533  | 52938    | 32116    | 23496     | 209264                 | 17683    | 43745      | 97081  |
| 1973 | 0           | 1100764  | 85241    | 34186    | 26750     | 240075                 | 23000    | 41733      | 122637 |
| 1974 | 0           | 1202962  | 89696    | 42413    | 32411     | <u>281595</u>          | 35245    | 50688      | 181262 |
| 1975 | 0           | 1301739  | 68948    | 36946    | 27609     | 278271                 | 42737    | 51740      | 143152 |
| 1976 | 0           | 1349250  | 73001    | 38606    | 28032     | 291817                 | 46172    | 55392      | 157933 |
| 1977 | 0           | 1397359  | 77108    | 40289    | 30071     | 305545                 | 49603    | 59094      | 172912 |
| 1978 | 0           | 1446154  | 81267    | 41993    | 31327     | 319446 <sup>1,50</sup> | 53077    | 62843      | 188079 |
| 1979 | 0           | 1495486  | 85475    | 43717    | 32597     | 333511                 | 56592    | 66635      | 203427 |
| 1980 | 0           | 1545370  | 89731    | 45460    | 33881     | 347733                 | 60147    | 70471      | 218945 |
| 1981 | 0           | 1595781  | 94031    | 47222    | 35179     | 362106                 | 63739    | 74346      | 234628 |
| 1982 | 0           | 1646700  | 98374    | 49001    | 36490     | 376624                 | 67367    | 78261      | 250469 |
| 1983 | 0           | 1693106  | 102759   | 50798    | 37813     | 391280                 | 71029    | 82213      | 266462 |
| 1984 | 0           | 1749382  | 107185   | 52611    | 39149     | 406070                 | 74726    | 86202      | 282600 |
| 1985 | 0           | 1802310  | 111648   | 54440    | 40496     | <u>420390</u>          | 78454    | 90220      | 298879 |
| 1986 | 0           | 1855077  | 116150   | 56264    | 41855     | 436034                 | 82214    | 94282      | 315295 |
| 1987 | 0           | 1908268  | 120687   | 58143    | 43224     | 451200                 | 86004    | 98371      | 331843 |
| 1988 | 0           | 1961870  | 125259   | 60016    | 44604     | 466482                 | 89623    | 102492     | 348518 |
| 1989 | 0           | 2015870  | 129866   | 61903    | 45994     | 481878                 | 93671    | 106644     | 365318 |
| 1990 | 0           | 2070257  | 134505   | 63804    | 47395     | 497385                 | 97546    | 110825     | 382237 |
| YBAR | 599782.68   | 43190.69 | 26392.84 | 19034.46 | 192180.19 | 21271.92               | 28524.54 | 49213.61   |        |

|     |           |          |         |         |          |          |         |          |
|-----|-----------|----------|---------|---------|----------|----------|---------|----------|
| B   | 23192.71  | 1978.40  | 810.54  | 597.11  | 6612.50  | 1652.55  | 1787.11 | 7215.23  |
| RSQ | 0.4155    | 0.3915   | 0.4156  | 0.3813  | 0.6187   | 0.4679   | 0.7983  | 0.7991   |
| SYX | 193444.44 | 17438.31 | 6818.10 | 5375.81 | 36827.33 | 12501.53 | 6358.80 | 25666.28 |
| SB  | 8243.13   | 743.72   | 239.79  | 227.34  | 1565.26  | 531.35   | 270.27  | 1090.86  |

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SOURCE:

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO A-101  
 PRODUCCION 1962-1974, CON PROYECCIONES HASTA 1990

PARAGUAY

EXPONENT IS 1.40

| AÑO  | TONELADAS   |          |               |              |              |               |        |               |               |
|------|-------------|----------|---------------|--------------|--------------|---------------|--------|---------------|---------------|
|      | CAÑA AZÚCAR |          |               |              | ARROZ        |               |        |               |               |
|      | PARA        | AZ.Y.ML. | ALCCORN       | PEROTOS      | TABACO       | MAIZ          | TRIGO  | EN CASCARA    | SOJA          |
| 1962 | 0           | 672000   | 32500         | 17600        | 16000        | 123400        | 7200   | 16800         | 2900          |
| 1963 | 0           | 700000   | 40000         | 19000        | 25000        | 120100        | 7000   | 16000         | 7200          |
| 1964 | 0           | 964100   | 35800         | 23700        | 12000        | 200000        | 9170   | 20000         | 10000         |
| 1965 | 0           | 991700   | 42002         | 36301        | 18000        | 100000        | 7040   | 21600         | 18000         |
| 1966 | 0           | 987500   | 28900         | 19320        | 8750         | 165400        | 7200   | 10100         | 20000         |
| 1967 | 0           | 987000   | 26700         | 22540        | 13500        | 225000        | 9160   | 18170         | 18000         |
| 1968 | 0           | 702000   | 30100         | 18000        | 22000        | 180000        | 20000  | 20000         | 13500         |
| 1969 | 0           | 821300   | 40500         | 17460        | 24000        | 153000        | 31376  | 27160         | 22000         |
| 1970 | 0           | 1415042  | 39617         | 34866        | 17723        | 258703        | 47650  | 45218         | 52065         |
| 1971 | 0           | 1407377  | 17485         | 25605        | 18218        | 229786        | 54811  | 38807         | 75132         |
| 1972 | 0           | 1044533  | 52938         | 32116        | 23476        | 209264        | 17683  | 43743         | 97081         |
| 1973 | 0           | 1100764  | 85241         | 34186        | 26750        | 240075        | 23000  | 41733         | 122637        |
| 1974 | 0           | 1202962  | <u>89636</u>  | <u>42413</u> | <u>32411</u> | <u>231593</u> | 35245  | <u>50688</u>  | <u>181262</u> |
| 1975 | 0           | 1316051  | 71662         | 37786        | 29357        | 283433        | 43824  | 53412         | 150942        |
| 1976 | 0           | 1370487  | 76562         | 39747        | 20824        | 249147        | 47706  | 57656         | 164451        |
| 1977 | 0           | 1426396  | 81595         | 41761        | 31330        | 315280        | 51693  | 62096         | 186434        |
| 1978 | 0           | 1483721  | 86756         | 43826        | 32875        | 331821        | 55780  | 66607         | 204873        |
| 1979 | 0           | 1542411  | 92039         | 45940        | 34457        | 348756        | 59965  | 712219        | 223751        |
| 1980 | 0           | 1602421  | 97441         | 46102        | 36074        | 366072        | 64244  | 75947         | 243053        |
| 1981 | 0           | 1663708  | 102959        | 50310        | 37725        | 383756        | 68615  | 80770         | 262766        |
| 1982 | 0           | 1726234  | 106587        | 52562        | 39410        | 401798        | 73073  | 85690         | 282878        |
| 1983 | 0           | 1789962  | 114324        | 54858        | 41127        | 420187        | 77617  | 90705         | 303376        |
| 1984 | 0           | 1854860  | 120166        | 57195        | 42875        | 438913        | 82245  | 95812         | 324250        |
| 1985 | 0           | 1920856  | <u>126111</u> | <u>59574</u> | <u>44656</u> | <u>457968</u> | 86954  | <u>101009</u> | <u>35521</u>  |
| 1986 | 0           | 1986043  | 132156        | 61993        | 46465        | 477343        | 91742  | 106293        | 367089        |
| 1987 | 0           | 2056273  | 138298        | 64451        | 48304        | 497031        | 96607  | 111662        | 389035        |
| 1988 | 0           | 2125561  | 144536        | 66947        | 50171        | 517024        | 101548 | 117114        | 411322        |
| 1989 | 0           | 2195883  | 150866        | 69430        | 52066        | 537315        | 106562 | 122648        | 433941        |
| 1990 | 0           | 2267217  | 157288        | 72050        | 53988        | 557899        | 111649 | 128262        | 456886        |

YRAR 999782.88 43150.69 26392.84 19834.46 192180.19 21271.92 28524.54 49213.61

|     |           |          |         |         |          |          |         |          |
|-----|-----------|----------|---------|---------|----------|----------|---------|----------|
| B   | 13342.53  | 1201.12  | 430.64  | 357.54  | 3845.99  | 951.42   | 1049.95 | 4291.66  |
| RSQ | 0.4077    | 0.4247   | 0.4302  | 0.4069  | 0.6174   | 0.4565   | 0.8147  | 0.8322   |
| SYX | 195735.21 | 17013.17 | 6732.51 | 5267.81 | 36891.10 | 12634.38 | 6093.82 | 23456.71 |
| SB  | 4848.39   | 421.46   | 165.78  | 130.87  | 913.09   | 312.99   | 150.96  | 581.09   |

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SOURCE:

MANUAL ESTADISTICO DEL PARAQUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
ENCUESTA AGROPECUARIO POR MUESTREO, 1970, 71, 72, 73, 74

CLASIFICACION A-104  
 HECTARIAS COSECHADAS 1962-1974, C.C. PROYECCIONES HASTA 1985  
 PARAGUAY

EXPLANATION IS C.40

100 HECTARIAS

AFRUTZ

ANC ALCOCCN POROTIS TARACC MAIZ TRIGG EN CASCAFA

1962 C 459 220 130 945 EC 7C  
 1963 C 629 290 200 550 100 7C  
 1964 O 435 315 55 1588 58 8C  
 1965 C 567 315 144 1644 108 8C  
 1966 C 623 322 70 1503 72 46

1967 C 382 322 108 1722 93 73  
 1968 O 372 303 123 1600 200 5C  
 1969 C 603 269 200 1275 343 100  
 1970 O 469 544 135 1874 447 230  
 1971 C 332 402 164 1501 515 216

1972 O 572 470 175 1844 221 225  
 1973 C 811 434 204 1959 203 215  
 1974 C 632 550 242 2601 303 229  
 1975 C 631 496 191 2162 272 219  
 1976 C 638 509 195 2214 287 228

1977 O 645 521 198 2263 432 236  
 1978 O 652 533 201 2311 416 244  
 1979 C 659 545 204 2357 430 252  
 1980 C 665 556 207 2401 443 260  
 1981 O 671 567 210 2444 456 267

1982 C 677 578 213 2486 468 274  
 1983 C 682 588 216 2526 481 281  
 1984 O 683 598 213 2566 472 288  
 1985 O 693 603 221 2604 504 295

YEAR 550.52 367.15 157.69 1655.92 221.00 122.62  
 H 60.00 167.36 42.60 635.28 150.61 109.23  
 FSC 0.0857 0.0587 0.2282 0.0678 0.4505 0.6444  
 SYX 170.33 67.72 45.40 261.26 112.57 47.01  
 SE 89.64 35.24 23.62 135.56 58.58 24.46

SOURCE: MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SFC. DE COORDINACION TECNICA  
 ENCUESTA AGROPECUARIO P.P. BUENSTREC, 1970, 71, 72, 73, 74

CLASIFICACION 4-104  
HECTARIAS COSECHADAS 1962-1974, CON PROYECCIONES HASTA 1985

PARAGUAY

EXPERIMENT IS C.60

100 HECTARIAS

ARROZ

| ANO  |   | ALGODON | PERCITOS | TABACO | MAIZ    | TRIGO EN CASCARA |        |
|------|---|---------|----------|--------|---------|------------------|--------|
| 1962 | 0 | 499     | 220      | 130    | 545     | 80               | 70     |
| 1963 | C | 625     | 250      | 200    | 560     | 100              | 70     |
| 1964 | 0 | 486     | 215      | 55     | 1588    | 98               | 80     |
| 1965 | 0 | 557     | 315      | 144    | 1644    | 108              | 80     |
| 1966 | C | 624     | 322      | 70     | 1503    | 72               | 46     |
| 1967 | C | 332     | 322      | 108    | 1732    | 33               | 73     |
| 1968 | 0 | 372     | 300      | 193    | 1800    | 200              | 90     |
| 1969 | C | 600     | 269      | 200    | 1275    | 343              | 100    |
| 1970 | C | 465     | 544      | 135    | 1874    | 447              | 230    |
| 1971 | C | 322     | 462      | 164    | 1901    | 515              | 216    |
| 1972 | 0 | 572     | 470      | 175    | 1844    | 321              | 225    |
| 1973 | 0 | 311     | 434      | 204    | 1856    | 203              | 215    |
| 1974 | C | 522     | 550      | 242    | 2601    | 303              | 275    |
| 1975 | 0 | 645     | 509      | 157    | 2207    | 357              | 230    |
| 1976 | C | 655     | 525      | 201    | 2270    | 406              | 241    |
| 1977 | 0 | 665     | 541      | 206    | 2331    | 424              | 252    |
| 1978 | C | 674     | 557      | 210    | 2342    | 442              | 252    |
| 1979 | 0 | 683     | 572      | 214    | 2450    | 460              | 273    |
| 1980 | 0 | 652     | 587      | 218    | 2508    | 477              | 283    |
| 1981 | C | 701     | 601      | 222    | 2564    | 454              | 293    |
| 1982 | C | 709     | 615      | 225    | 2615    | 511              | 303    |
| 1983 | 0 | 713     | 623      | 230    | 2673    | 527              | 312    |
| 1984 | C | 726     | 643      | 234    | 2726    | 543              | 322    |
| 1985 | 0 | 734     | 657      | 237    | 2778    | 555              | 331    |
| YEAR |   | 559.92  | 387.15   | 157.65 | 1655.52 | 221.00           | 132.02 |
| B    |   | 47.70   | 75.24    | 21.73  | 307.27  | 92.45            | 54.75  |
| RSJ  |   | 0.1042  | 0.0753   | 0.2583 | 0.6680  | 0.4998           | 0.6885 |
| SYX  |   | 163.60  | 65.64    | 44.50  | 261.17  | 111.53           | 44.00  |
| SH   |   | 42.16   | 16.41    | 11.13  | 65.31   | 27.89            | 11.00  |

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA

SOURCE: ENCUESTA AGRPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO A-104  
HECTARIAS DESECHADAS 1962-1974, CON PROYECCIONES HASTA 1985

PARAGUAY

EXPOONENT IS 0.80

100 HECTARIAS

AREA

| ANO  |   | ALGODON | PEREJOS | TABACCO | MAIZ    | TRIGO EN CASCARA |        |
|------|---|---------|---------|---------|---------|------------------|--------|
| 1962 | C | 459     | 220     | 130     | 545     | 80               | 70     |
| 1963 | C | 629     | 250     | 200     | 560     | 100              | 70     |
| 1964 | C | 486     | 315     | 55      | 1588    | 58               | 80     |
| 1965 | C | 567     | 315     | 144     | 1644    | 108              | 80     |
| 1966 | C | 628     | 322     | 70      | 1503    | 72               | 46     |
| 1967 | C | 382     | 322     | 108     | 1732    | 83               | 72     |
| 1968 | C | 372     | 300     | 183     | 1800    | 200              | 90     |
| 1969 | C | 600     | 269     | 200     | 1275    | 342              | 100    |
| 1970 | C | 409     | 344     | 135     | 1874    | 447              | 230    |
| 1971 | C | 322     | 462     | 164     | 1501    | 515              | 216    |
| 1972 | C | 572     | 470     | 175     | 1844    | 321              | 225    |
| 1973 | C | 811     | 434     | 204     | 1856    | 202              | 215    |
| 1974 | C | 932     | 550     | 242     | 2001    | 302              | 229    |
| 1975 | C | 661     | 522     | 202     | 2245    | 400              | 240    |
| 1975 | C | 674     | 542     | 208     | 2325    | 422              | 254    |
| 1977 | C | 687     | 562     | 213     | 2401    | 446              | 268    |
| 1978 | C | 699     | 531     | 219     | 2475    | 469              | 281    |
| 1979 | C | 712     | 500     | 225     | 2548    | 491              | 295    |
| 1980 | C | 724     | 619     | 230     | 2621    | 513              | 308    |
| 1981 | C | 736     | 638     | 235     | 2693    | 534              | 321    |
| 1982 | C | 748     | 657     | 241     | 2764    | 556              | 334    |
| 1983 | C | 760     | 675     | 246     | 2835    | 577              | 347    |
| 1984 | C | 772     | 693     | 251     | 2905    | 598              | 359    |
| 1985 | C | 784     | 712     | 256     | 2974    | 619              | 372    |
| YEAR |   | 559.92  | 387.15  | 157.65  | 1655.92 | 221.00           | 132.62 |
| E    |   | 27.70   | 42.55   | 12.19   | 162.85  | 49.22            | 25.57  |
| RSC  |   | 0.1243  | 0.6542  | 0.2869  | 0.6649  | 0.5013           | 0.7249 |
| SYX  |   | 166.68  | 64.09   | 43.64   | 262.35  | 111.31           | 41.35  |
| SB   |   | 22.14   | 8.51    | 5.80    | 34.86   | 14.75            | 5.45   |

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969. SEC. DE COORDINACION TECNICA

SOURCE: ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO A-104  
HECTARIAS COSECHADAS 1962-1974, CON PROYECCIONES HASTA 1985

PARAGUAY

EXPOSICION IS 1.00

100 HECTARIAS

ARPCZ

| ANO  |   | ALGODON | FORAJOS | TARACE | MAIZ    | TRIGO EN CASCARA |        |
|------|---|---------|---------|--------|---------|------------------|--------|
| 1962 | J | 499     | 220     | 130    | 949     | 80               | 70     |
| 1963 | O | 629     | 250     | 200    | 960     | 100              | 70     |
| 1964 | C | 486     | 315     | 95     | 1598    | 98               | 80     |
| 1965 | C | 567     | 315     | 144    | 1044    | 108              | 80     |
| 1966 | O | 629     | 322     | 70     | 1503    | 72               | 46     |
| 1967 | O | 392     | 322     | 108    | 1732    | 83               | 73     |
| 1968 | C | 372     | 300     | 143    | 1800    | 200              | 90     |
| 1969 | C | 600     | 269     | 200    | 1275    | 343              | 100    |
| 1970 | C | 469     | 544     | 135    | 1874    | 447              | 220    |
| 1971 | C | 322     | 462     | 104    | 1901    | 515              | 216    |
| 1972 | C | 572     | 470     | 175    | 1844    | 321              | 225    |
| 1973 | C | 811     | 434     | 204    | 1856    | 203              | 215    |
| 1974 | C | 932     | 550     | 242    | 2601    | 303              | 225    |
| 1975 | C | 677     | 535     | 207    | 2239    | 412              | 250    |
| 1976 | C | 694     | 598     | 215    | 2330    | 440              | 267    |
| 1977 | C | 711     | 592     | 222    | 2470    | 467              | 284    |
| 1978 | C | 727     | 600     | 229    | 2561    | 494              | 301    |
| 1979 | C | 744     | 630     | 236    | 2651    | 522              | 318    |
| 1980 | O | 761     | 654     | 243    | 2742    | 549              | 335    |
| 1981 | C | 778     | 678     | 250    | 2832    | 576              | 351    |
| 1982 | C | 794     | 702     | 257    | 2923    | 604              | 368    |
| 1983 | C | 811     | 726     | 264    | 3013    | 631              | 385    |
| 1984 | J | 823     | 750     | 271    | 3104    | 658              | 402    |
| 1985 | C | 845     | 774     | 279    | 3195    | 686              | 419    |
| YPAR |   | 559.92  | 367.15  | 157.69 | 1655.92 | 221.00           | 132.02 |
| B    |   | 16.74   | 25.91   | 7.11   | 50.50   | 27.34            | 16.82  |
| RSQ  |   | 0.1461  | 0.7041  | 0.3132 | 0.6596  | 0.4973           | 0.7530 |
| SYX  |   | 164.60  | 63.05   | 42.82  | 264.44  | 111.30           | 39.14  |
| SP   |   | 12.20   | 4.67    | 3.17   | 19.60   | 8.29             | 2.90   |

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
 FUENTE: ENCUESTA AGRICOLA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO A-104  
HECTARIAS COSECHADAS 1962-1974, POR SUBSECCIONES HASTA 1985

PARAGUAY

EXPERIMENT IS 1.23

100 HECTARIAS

APRIL

| ANC  |   | ALGODON | PERCOTOS | TABACO | MAIZ    | TRIGO EN CASCARA |        |
|------|---|---------|----------|--------|---------|------------------|--------|
| 1962 | G | 499     | 220      | 130    | 549     | 80               | 70     |
| 1963 | O | 629     | 250      | 200    | 560     | 100              | 70     |
| 1964 | C | 486     | 315      | 55     | 1588    | 58               | 80     |
| 1965 | C | 567     | 315      | 144    | 1644    | 108              | 80     |
| 1966 | O | 623     | 322      | 70     | 1503    | 72               | 46     |
| 1967 | C | 382     | 322      | 108    | 1732    | 83               | 73     |
| 1968 | C | 372     | 300      | 183    | 1800    | 200              | 90     |
| 1969 | C | 600     | 269      | 200    | 1275    | 343              | 100    |
| 1970 | O | 449     | 564      | 135    | 1874    | 447              | 230    |
| 1971 | C | 332     | 462      | 154    | 1901    | 515              | 216    |
| 1972 | C | 572     | 470      | 175    | 1844    | 321              | 225    |
| 1973 | C | 811     | 434      | 204    | 1856    | 203              | 215    |
| 1974 | O | 932     | 550      | 242    | 2601    | 303              | 229    |
| 1975 | C | 654     | 546      | 213    | 2328    | 423              | 260    |
| 1975 | O | 715     | 575      | 221    | 2434    | 455              | 280    |
| 1977 | C | 737     | 603      | 230    | 2541    | 487              | 300    |
| 1978 | O | 758     | 632      | 239    | 2650    | 520              | 321    |
| 1979 | C | 780     | 661      | 243    | 2760    | 553              | 342    |
| 1980 | C | 803     | 691      | 257    | 2871    | 586              | 363    |
| 1981 | C | 825     | 721      | 266    | 2982    | 620              | 384    |
| 1982 | O | 343     | 751      | 276    | 3096    | 654              | 405    |
| 1983 | C | 870     | 782      | 285    | 3211    | 688              | 427    |
| 1984 | O | 894     | 812      | 294    | 3326    | 723              | 449    |
| 1985 | C | 917     | 843      | 304    | 3442    | 758              | 471    |
| YBAR |   | 559.92  | 357.15   | 157.69 | 1655.92 | 221.00           | 132.62 |
| B    |   | 10.71   | 13.77    | 4.23   | 51.64   | 15.52            | 9.78   |
| RSC  |   | 0.1687  | 0.7097   | 0.5369 | 0.6531  | 0.4876           | 0.7749 |
| SYX  |   | 162.42  | 62.45    | 42.08  | 266.57  | 112.38           | 37.40  |
| SE   |   | 6.90    | 2.65     | 1.79   | 11.35   | 4.80             | 1.55   |

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
SOURCE: ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CLASIFICACION A-104  
HECTARIAS COSECHADAS 1962-1974, CON PROYECCIONES HASTA 1985

PARAQUAY

EXPOONENT IS 1.40

100 HECTARIAS

ARROZ

| ANO  |   | ALGODON | POROTOS | TAPACO | MAIZ    | TRIGO EN CASCARA |        |
|------|---|---------|---------|--------|---------|------------------|--------|
| 1962 | C | 499     | 229     | 100    | 949     | 80               | 70     |
| 1963 | C | 629     | 250     | 200    | 960     | 100              | 70     |
| 1964 | C | 485     | 315     | 95     | 1508    | 98               | 80     |
| 1965 | C | 557     | 315     | 144    | 1644    | 108              | 80     |
| 1966 | C | 623     | 322     | 70     | 1502    | 72               | 46     |
| 1967 | C | 382     | 322     | 108    | 1732    | 83               | 73     |
| 1968 | C | 372     | 300     | 183    | 1800    | 200              | 90     |
| 1969 | C | 600     | 269     | 200    | 1775    | 343              | 100    |
| 1970 | C | 469     | 544     | 135    | 1874    | 447              | 230    |
| 1971 | C | 332     | 467     | 164    | 1901    | 515              | 216    |
| 1972 | C | 572     | 470     | 175    | 1844    | 321              | 225    |
| 1973 | C | 811     | 434     | 204    | 1856    | 293              | 215    |
| 1974 | C | 922     | 550     | 242    | 2601    | 303              | 229    |
| 1975 | C | 712     | 558     | 218    | 2365    | 432              | 245    |
| 1976 | C | 738     | 590     | 228    | 2408    | 465              | 293    |
| 1977 | C | 765     | 624     | 239    | 2613    | 506              | 317    |
| 1978 | C | 752     | 659     | 250    | 2742    | 544              | 341    |
| 1979 | C | 321     | 654     | 261    | 2872    | 584              | 367    |
| 1980 | C | 849     | 720     | 272    | 3008    | 624              | 393    |
| 1981 | C | 879     | 767     | 284    | 3145    | 665              | 415    |
| 1982 | C | 909     | 805     | 296    | 3286    | 707              | 446    |
| 1983 | C | 940     | 843     | 308    | 3429    | 749              | 473    |
| 1984 | C | 971     | 882     | 320    | 3574    | 793              | 501    |
| 1985 | C | 1002    | 922     | 333    | 3722    | 837              | 530    |
| YPAR |   | 559.92  | 367.15  | 157.69 | 1655.72 | 221.00           | 132.62 |
| B    |   | 5.41    | 8.02    | 2.54   | 29.93   | 4.52             | 5.76   |
| FSC  |   | 0.1918  | 0.7117  | 0.3577 | 0.6460  | 0.4738           | 0.7896 |
| SYX  |   | 160.14  | 62.24   | 41.41  | 269.68  | 114.39           | 36.16  |
| SB   |   | 3.97    | 1.54    | 1.03   | 6.68    | 2.83             | 0.90   |

SOURCE: MANUAL ESTADISTICO DEL PARAQUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CLASRO A-1.1  
 PRODUCCION 1962-1974, CON PROYECCIONES HASTA 1985

PROYECCIONES FINALES

TONELADAS

ARPCZ

ANO MAIZ EN CÁSCAPA

|      |   |        |       |
|------|---|--------|-------|
| 1962 | 0 | 123400 | 16800 |
| 1963 | 0 | 120100 | 16000 |
| 1964 | 0 | 204000 | 20000 |
| 1965 | 0 | 100000 | 21600 |
| 1966 | C | 165400 | 10100 |

|      |   |        |       |
|------|---|--------|-------|
| 1967 | 0 | 225000 | 18170 |
| 1968 | C | 180000 | 20800 |
| 1969 | C | 153000 | 27160 |
| 1970 | 0 | 258703 | 45218 |
| 1971 | C | 229786 | 36807 |

|      |   |        |       |
|------|---|--------|-------|
| 1972 | C | 209294 | 43743 |
| 1973 | 0 | 246075 | 41733 |
| 1974 | 0 | 281595 | 50688 |
| 1975 | C | 291400 | 56280 |
| 1976 | C | 302917 | 59345 |

|      |   |        |       |
|------|---|--------|-------|
| 1977 | 0 | 314434 | 62410 |
| 1978 | 0 | 325952 | 65474 |
| 1979 | 0 | 337469 | 68539 |
| 1980 | 0 | 348986 | 71604 |
| 1981 | 0 | 360504 | 74669 |

|      |   |        |       |
|------|---|--------|-------|
| 1982 | C | 372021 | 77734 |
| 1983 | C | 383538 | 80799 |
| 1984 | C | 395056 | 83864 |
| 1985 | 0 | 406573 | 86929 |

SOURCE:

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
 ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUACRC A-1  
 PRODUCCION 1962-1984, CON PROYECCIONES HASTA 1985

PROYECCIONES PRELIMINARES

EXPOENENT IS 1.00

TONELACAS

AFRCZ

ANO MAIZ EN CASCARA

|      |   |        |       |
|------|---|--------|-------|
| 1962 | 0 | 123400 | 16800 |
| 1963 | 0 | 120100 | 16000 |
| 1964 | 0 | 206000 | 20000 |
| 1965 | 0 | 100000 | 21600 |
| 1966 | C | 165400 | 10100 |

|      |   |        |       |
|------|---|--------|-------|
| 1967 | C | 225000 | 19170 |
| 1968 | C | 180000 | 20800 |
| 1969 | C | 153000 | 27160 |
| 1970 | C | 259703 | 45218 |
| 1971 | C | 229766 | 38807 |

|      |   |        |       |
|------|---|--------|-------|
| 1972 | C | 209264 | 43743 |
| 1973 | 0 | 246375 | 41733 |
| 1974 | 0 | 281555 | 50688 |
| 1975 | 0 | 272000 | 49979 |
| 1976 | 0 | 284319 | 53044 |

|      |   |        |       |
|------|---|--------|-------|
| 1977 | C | 255836 | 56109 |
| 1978 | 0 | 307354 | 59173 |
| 1979 | C | 318971 | 62238 |
| 1980 | C | 330388 | 65303 |
| 1981 | 0 | 341906 | 68365 |

|      |   |        |       |
|------|---|--------|-------|
| 1982 | 0 | 353423 | 71433 |
| 1983 | C | 364940 | 74408 |
| 1984 | 0 | 376458 | 77563 |
| 1985 | 0 | 387975 | 80629 |

|      |           |          |
|------|-----------|----------|
| YEAR | 192180.19 | 28524.54 |
| B    | 11517.33  | 3064.89  |
| FSC  | 0.6171    | 0.7754   |
| SYX  | 36904.60  | 6709.59  |
| SE   | 2735.55   | 497.35   |

CUADRO A-41  
 PRODUCCION 1962-1974, CON PROYECCIONES HASTA 1985

TENELACAS

MAIZ

| AÑO  | CONCEPCION | SAN PEDRO | CORDOBA | GUIRA | GAAGUAZU | GAAZAPA | ITAPUA | MISIONES | PARAGUARI |
|------|------------|-----------|---------|-------|----------|---------|--------|----------|-----------|
| 1962 | 4300       | 5800      | 18300   | 6900  | 9200     | 12400   | 29100  | 3200     | 16200     |
| 1963 | 7000       | 6800      | 18400   | 7300  | 9500     | 13200   | 18300  | 3300     | 16600     |
| 1964 | 10100      | 10400     | 23400   | 16300 | 14500    | 15200   | 29900  | 9800     | 41200     |
| 1965 | 6476       | 7619      | 16143   | 6810  | 9332     | 7857    | 15714  | 3714     | 16476     |
| 1966 | 5700       | 16800     | 15300   | 15000 | 17200    | 11500   | 23500  | 6700     | 24600     |
| 1967 | 9300       | 17100     | 24500   | 17700 | 25000    | 15900   | 23800  | 11400    | 43600     |
| 1968 | 7700       | 11900     | 18200   | 13900 | 18900    | 13000   | 24300  | 9600     | 35800     |
| 1969 | 4600       | 5900      | 15400   | 8400  | 20600    | 11200   | 27300  | 7700     | 32500     |
| 1970 | 10874      | 20623     | 14933   | 17848 | 21478    | 14988   | 61806  | 12279    | 29726     |
| 1971 | 8541       | 14869     | 14095   | 16155 | 24346    | 13627   | 53776  | 8781     | 29755     |
| 1972 | 10524      | 23718     | 16380   | 15027 | 22928    | 9080    | 40502  | 5919     | 29274     |
| 1973 | 12103      | 23984     | 12547   | 20075 | 24575    | 15226   | 46726  | 10570    | 32659     |
| 1974 | 13700      | 26320     | 13160   | 19092 | 31823    | 15803   | 48184  | 12892    | 36879     |
| 1975 | 13096      | 28405     | 14872   | 21151 | 33625    | 14390   | 57836  | 12781    | 38278     |
| 1976 | 13559      | 30136     | 14027   | 21945 | 35357    | 14243   | 60750  | 13311    | 38842     |
| 1977 | 14022      | 31870     | 13174   | 22738 | 37052    | 14094   | 63665  | 13840    | 39400     |
| 1978 | 14484      | 33606     | 12313   | 23532 | 38823    | 13941   | 66585  | 14370    | 39956     |
| 1979 | 14946      | 35343     | 11459   | 24325 | 40565    | 13787   | 69503  | 14900    | 40510     |
| 1980 | 15409      | 37090     | 10601   | 25118 | 42301    | 13634   | 72422  | 15430    | 41065     |
| 1981 | 15871      | 38815     | 9744    | 25911 | 44038    | 13481   | 75341  | 15560    | 41620     |
| 1982 | 16333      | 40550     | 8991    | 26705 | 45772    | 13330   | 78258  | 16489    | 42178     |
| 1983 | 16796      | 42283     | 8041    | 27499 | 47506    | 13181   | 81173  | 17020    | 42739     |
| 1984 | 17260      | 44013     | 7197    | 28292 | 49239    | 13036   | 84086  | 17549    | 43302     |
| 1985 | 17723      | 45742     | 6358    | 29086 | 50970    | 12892   | 86957  | 18079    | 43865     |

1178-

SOURCE:

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
 ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CLADRC A-41  
 PRODUCCION 1962-1974, CON PROYECCIONES HASTA 1985

TCNELACAS

MAIZ

| AÑO  | AL PARANA | CENTRAL | NEEMBUCU | AMAEAY | CHACC | TOTAL  |
|------|-----------|---------|----------|--------|-------|--------|
| 1962 | 800       | 10500   | 3100     | 2600   | 1000  | 123399 |
| 1963 | 800       | 9400    | 6000     | 2400   | 1100  | 120099 |
| 1964 | 3800      | 17100   | 10700    | 3200   | 500   | 205999 |
| 1965 | 1619      | 6000    | 4505     | 2762   | 571   | 95999  |
| 1966 | 4000      | 10400   | 6800     | 6500   | 1400  | 165399 |
| 1967 | 5900      | 11600   | 8700     | 6200   | 2300  | 224999 |
| 1968 | 5200      | 7500    | 8000     | 4000   | 2100  | 179999 |
| 1969 | 3900      | 5600    | 3200     | 2500   | 200   | 152999 |
| 1970 | 19127     | 8079    | 11572    | 9643   | 427   | 258702 |
| 1971 | 20366     | 5030    | 5343     | 10163  | 489   | 229785 |
| 1972 | 11856     | 5816    | 5216     | 8288   | 656   | 209283 |
| 1973 | 17811     | 8553    | 11850    | 7826   | 570   | 246074 |
| 1974 | 30502     | 7392    | 10542    | 9622   | 713   | 281594 |
| 1975 | 27919     | 5264    | 12067    | 11189  | 526   | 291399 |
| 1976 | 30631     | 5210    | 12493    | 11894  | 521   | 302916 |
| 1977 | 33352     | 5154    | 12918    | 12599  | 515   | 314433 |
| 1978 | 36077     | 5098    | 13343    | 13305  | 510   | 325951 |
| 1979 | 38805     | 5041    | 13767    | 14011  | 504   | 337468 |
| 1980 | 41532     | 4985    | 14192    | 14719  | 499   | 348985 |
| 1981 | 44258     | 4529    | 14618    | 15424  | 493   | 360503 |
| 1982 | 46981     | 4873    | 15043    | 16130  | 487   | 372020 |
| 1983 | 49697     | 4819    | 15468    | 16835  | 482   | 383537 |
| 1984 | 52409     | 4764    | 15893    | 17539  | 476   | 395055 |
| 1985 | 55116     | 4711    | 16319    | 18242  | 471   | 406572 |

SOURCE:

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
 ENCUESTA AGROPPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO A-2  
HECTARIAS CECSECHAGAS 1962-1974, C.C. PROYECCIONES HASTA 1985  
100 HECTARIAS

EXPLIMENT IS C.E.C

PROYECCIONES PRELIMINARES

ANC MAIZ

|      |   |      |
|------|---|------|
| 1962 | C | 549  |
| 1963 | C | 560  |
| 1964 | C | 1588 |
| 1965 | C | 1644 |
| 1966 | C | 1503 |
| 1967 | C | 1732 |
| 1968 | C | 1800 |
| 1969 | C | 1275 |
| 1970 | C | 1374 |
| 1971 | C | 1501 |
| 1972 | C | 1844 |
| 1973 | C | 1856 |
| 1974 | C | 2601 |
| 1975 | C | 2207 |
| 1976 | C | 2270 |
| 1977 | C | 2231 |
| 1978 | C | 2352 |
| 1979 | C | 2450 |
| 1980 | C | 2503 |
| 1981 | C | 2564 |
| 1982 | C | 2619 |
| 1983 | C | 2672 |
| 1984 | C | 2725 |
| 1985 | C | 2778 |

YEAR 1655.52  
3 207.27  
FSC C.6630  
SYX 261.17  
SB 65.31

SOURCE: MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO A-42  
HECTARIAS COSECHADAS 1962-1974, CON PROYECCIONES HASTA 1985

100 HECTARIAS

MAIZ

| AÑO  | CONDICION | SAN PEDRO | CCFD'ERA | GUIRA | GAAGUAZL | GAZAPA | ITAPUA | MISIONES | PARAGUARI |
|------|-----------|-----------|----------|-------|----------|--------|--------|----------|-----------|
| 1962 | 36        | 47        | 123      | 46    | 77       | 82     | 200    | 46       | 126       |
| 1963 | 40        | 48        | 136      | 48    | 69       | 88     | 191    | 42       | 126       |
| 1964 | 65        | 87        | 167      | 109   | 121      | 108    | 223    | 98       | 345       |
| 1965 | 69        | 91        | 173      | 112   | 133      | 112    | 239    | 96       | 353       |
| 1966 | 57        | 99        | 153      | 113   | 142      | 96     | 206    | 85       | 306       |
| 1967 | 73        | 109       | 184      | 135   | 167      | 116    | 227    | 93       | 337       |
| 1968 | 76        | 119       | 190      | 138   | 188      | 121    | 241    | 95       | 357       |
| 1969 | 43        | 84        | 118      | 98    | 172      | 92     | 209    | 80       | 245       |
| 1970 | 90        | 124       | 145      | 140   | 182      | 98     | 229    | 122      | 286       |
| 1971 | 79        | 117       | 155      | 146   | 202      | 106    | 311    | 103      | 307       |
| 1972 | 83        | 171       | 156      | 128   | 193      | 94     | 313    | 89       | 296       |
| 1973 | 55        | 142       | 142      | 135   | 215      | 104    | 306    | 82       | 301       |
| 1974 | 124       | 202       | 203      | 183   | 221      | 150    | 400    | 129      | 354       |
| 1975 | 114       | 193       | 175      | 185   | 290      | 127    | 331    | 126      | 352       |
| 1976 | 118       | 201       | 179      | 192   | 303      | 127    | 391    | 128      | 399       |
| 1977 | 121       | 209       | 178      | 198   | 315      | 127    | 401    | 130      | 405       |
| 1978 | 126       | 217       | 177      | 203   | 327      | 127    | 410    | 133      | 412       |
| 1979 | 129       | 225       | 176      | 209   | 338      | 128    | 419    | 136      | 417       |
| 1980 | 133       | 232       | 175      | 215   | 349      | 128    | 428    | 138      | 423       |
| 1981 | 137       | 240       | 174      | 221   | 361      | 128    | 437    | 140      | 428       |
| 1982 | 140       | 248       | 173      | 225   | 372      | 128    | 445    | 142      | 434       |
| 1983 | 143       | 255       | 173      | 231   | 383      | 128    | 453    | 145      | 439       |
| 1984 | 147       | 261       | 171      | 236   | 394      | 128    | 462    | 147      | 445       |
| 1985 | 150       | 269       | 171      | 241   | 404      | 129    | 469    | 149      | 449       |

SOURCE:

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO A-42  
HECTARIAS CESECHADAS 1962-1974, CON PROYECCIONES HASTA 1985

100 HECTARIAS

MAIZ

| AÑO  | AL PARANA | CENTRAL | NEEMBUCU | AMARAY | CHACO | TOTAL |
|------|-----------|---------|----------|--------|-------|-------|
| 1962 | 8         | 54      | 34       | 22     | 8     | 548   |
| 1963 | 9         | 84      | 50       | 20     | 5     | 555   |
| 1964 | 25        | 114     | 85       | 22     | 5     | 1537  |
| 1965 | 26        | 118     | 89       | 23     | 5     | 1643  |
| 1966 | 33        | 104     | 65       | 32     | 12    | 1502  |
| 1967 | 46        | 115     | 77       | 35     | 18    | 1731  |
| 1968 | 51        | 55      | 75       | 40     | 23    | 1799  |
| 1969 | 26        | 55      | 25       | 15     | 5     | 1274  |
| 1970 | 57        | 82      | 113      | 61     | 5     | 1873  |
| 1971 | 101       | 86      | 111      | 67     | 6     | 1900  |
| 1972 | 76        | 67      | 118      | 55     | 5     | 1843  |
| 1973 | 90        | 82      | 95       | 57     | 6     | 1855  |
| 1974 | 163       | 101     | 133      | 86     | 9     | 2600  |
| 1975 | 138       | 82      | 132      | 80     | 8     | 2427  |
| 1976 | 147       | 79      | 137      | 84     | 7     | 2490  |
| 1977 | 156       | 75      | 142      | 88     | 7     | 2501  |
| 1978 | 165       | 72      | 146      | 91     | 6     | 2612  |
| 1979 | 175       | 69      | 150      | 95     | 6     | 2670  |
| 1980 | 183       | 65      | 154      | 100    | 5     | 2728  |
| 1981 | 191       | 62      | 159      | 103    | 4     | 2784  |
| 1982 | 200       | 58      | 163      | 107    | 4     | 2839  |
| 1983 | 208       | 56      | 167      | 110    | 3     | 2893  |
| 1984 | 216       | 52      | 170      | 114    | 3     | 2946  |
| 1985 | 224       | 49      | 174      | 117    | 3     | 2998  |

FUENTES:

MANUAL ESTADISTICO DEL PARAGUAY, 1962-1969, SEC. DE COORDINACION TECNICA  
ENCUESTA AGROPECUARIA POR MUESTREO, 1970, 71, 72, 73, 74

CUADRO A-3  
REQUERIMIENTO DE RENDIMIENTOS MÍNIMOS PARA ALCANZAR LOS NIVELES DE PRODUCCIÓN 1975-1985  
PROMEDIO NACIONAL POR CULTIVO

EXPOSICIÓN IS 1.00

| AÑO  |   | KG POR HECTÁREA |      |         |          |        |      |        |       |                  |            |        |
|------|---|-----------------|------|---------|----------|--------|------|--------|-------|------------------|------------|--------|
|      |   | TRIGO           | MAIZ | ALGODÓN | PERDIDAS | TABACO | SOJA | AZÚCAR | MAÍZ  | ARROZ EN CASCAPA | SORGO PARA | GRANOS |
| 1975 | C | 930             | 1200 | 1000    | 690      | 1300   | 1450 | 40620  | 33740 | 2130             | 1820       | 1310   |
| 1976 | C | 920             | 1220 | 1020    | 670      | 1310   | 1320 | 40730  | 33900 | 2070             | 1850       | 1310   |
| 1977 | C | 910             | 1230 | 1040    | 670      | 1310   | 1210 | 40850  | 34020 | 1930             | 1920       | 1320   |
| 1978 | C | 890             | 1250 | 1060    | 670      | 1320   | 1130 | 40980  | 34080 | 1860             | 1930       | 1320   |
| 1979 | O | 880             | 1260 | 1080    | 660      | 1320   | 1060 | 41150  | 34090 | 1770             | 1920       | 1330   |
| 1980 | C | 870             | 1280 | 1100    | 660      | 1330   | 1010 | 41340  | 34030 | 1720             | 1920       | 1330   |
| 1981 | C | 860             | 1290 | 1120    | 660      | 1330   | 960  | 41600  | 33910 | 1670             | 1910       | 1340   |
| 1982 | C | 850             | 1310 | 1140    | 650      | 1330   | 920  | 41920  | 33700 | 1630             | 1880       | 1340   |
| 1983 | G | 840             | 1330 | 1160    | 650      | 1340   | 890  | 43410  | 33380 | 1590             | 1860       | 1340   |
| 1984 | C | 840             | 1340 | 1180    | 650      | 1340   | 860  | 42950  | 32930 | 1550             | 1830       | 1350   |
| 1985 | C | 830             | 1360 | 1190    | 650      | 1340   | 830  | 43770  | 32310 | 1520             | 1790       | 1350   |

SOURCE:

CUADRO A-1.1, A-2.1



APPENDIX B

Table A Transportation Cost/Ton from Paraguay to B.A.

Table B Calculated Freight Rates, Landing Charges, and Tariffs, Principal Shipping Points to B.A.

Table C Ocean Freight rates to Rotterdam.

TABLE A  
 TRANSPORTATION COST/TON FROM PARAGUAY TO B.A.  
 Guarines

|                         |       | 1970 | 1971 | 1972  | 1973  | 1974  |
|-------------------------|-------|------|------|-------|-------|-------|
| <b>BARGE</b>            |       |      |      |       |       |       |
| From As.                | .5627 | 509  | 539  | 599   | 667   | 827   |
| From Enc.               | .17   | 145  | 151  | 167   | 185   | 233   |
| From Conc.              | .1173 | 136  | 144  | 160   | 178   | 225   |
| <br>                    |       |      |      |       |       |       |
| <b>TRUCK &amp; R.R.</b> |       |      |      |       |       |       |
| From As.                | .0993 | 139  | 145  | 161   | 178   | 224   |
| From Enc.               | .03   | 39   | 41   | 45    | 50    | 63    |
| From Conc.              | .0207 | 16   | 17   | 18    | 21    | 26    |
| <br>                    |       |      |      |       |       |       |
| <b>Tarrif at B.A.</b>   |       |      |      |       |       |       |
| From Barge              |       | 152  | 160  | 176   | 197   | 246   |
| From Truck and R.R.     |       | 31   | 33   | 36    | 40    | 50    |
|                         |       | 1167 | 1230 | 1362  | 1516  | 1894  |
|                         |       | 9.26 | 9.76 | 10.81 | 12.03 | 15.03 |

Various Data Sources: See explanation following Table C.

FOR CALCULATION OF OTHER COSTS

1. Assumed that 85% of the total volume comes to B.A. on barges and 15% by truck and rail (used only the truck rates).
2. As we have no idea regarding the transportation cost from "OTHER" origins we divided the proportion of total volume arriving from "OTHER" origins among the three origins, namely Asuncion, Encarcion, and Concepcion, using the percentages of each city as the weights, thus assumed that:

| POINT OF ORIGIN | % OF TOTAL VOLUME |
|-----------------|-------------------|
| Asuncion        | 66.2%             |
| Encarcion       | 20.0%             |
| Concepcion      | 13.8%             |

3. Thus we can calculate that  $(.85)(.662) = .5627$  tons arrive at B.A., by barge from Asuncion. Similarly, we calculated how much arrives from each origin and by what means.
4. We know the barge rates from each origin to B.A. for 1974. Assuming same rates of changes as in the consumer price index plus a random positive or negative factor, we calculated barge rates for other years. Table B.
5. Truck rates are available only for 1974 and from Encarcion to B.A. We calculated rates from Asuncion and Concepcion to B.A. assuming they are different in the same proportion as the barge rates. Calculation for different years was done in the same way as for barge.
6. Tarriff at B.A. was added  $(85)(\text{tarriff for grain arriving by barge})$  and  $(15)(\text{tarriff for grain arriving by truck})$ . Table A

TABLE B

CALCULATED FREIGHT RATES, LOADING CHARGES, AND  
TARIFFS, PRINCIPAL SHIPPING POINTS TO B.A.

|                       |       | 1970  | Guarines<br>1971 | 1972  | 1973  | 1974  |
|-----------------------|-------|-------|------------------|-------|-------|-------|
| AT B.A.               |       |       |                  |       |       |       |
|                       | Barge | 179.2 | 188              | 207.1 | 231.7 | 289.8 |
| Tariff                |       |       |                  |       |       |       |
| Cost in               | Rail  | 249.5 | 261.8            | 288   | 322.2 | 403.2 |
| G\$                   | Truck | 163.6 | 171.7            | 188.9 | 211.4 | 264.6 |
| BARGE                 |       |       |                  |       |       |       |
| Asun. to B.A.         |       | 905   | 958              | 1065  | 1185  | 1470  |
| (plus loading charge) |       |       |                  |       |       |       |
| Conc. to B.A.         |       | 1163  | 1228             | 1362  | 1515  | 1918  |
| (plus loading charge) |       |       |                  |       |       |       |
| Enc. to B.A.          |       | 851   | 890              | 984   | 1090  | 1370  |
| (plus loading charge) |       |       |                  |       |       |       |
| TRUCK                 |       |       |                  |       |       |       |
| Asun. to B.A.         |       | 1403  | 1463             | 1622  | 1798  | 2253  |
| (plus loading charge) |       |       |                  |       |       |       |
| Conc. to B.A.         |       | 769   | 813              | 891   | 1002  | 1260  |
| (plus loading charge) |       |       |                  |       |       |       |
| Enc. to B.A.          |       | 1303  | 1357             | 1504  | 1667  | 2100  |
| (plus loading charge) |       |       |                  |       |       |       |

Various Data Sources: See explanation following Table C.

TABLE C  
OCEAN FREIGHT RATES TO ROTTERDAM  
July to July Averages

| YEAR    | U.S.  | ARGENTINA |
|---------|-------|-----------|
| 1970-71 | 6.31  | 10.22     |
| 1971-72 | 3.02  | 6.15      |
| 1972-73 | 7.44  | 12.67     |
| 1973-74 | 16.09 | 27.25     |
| 1974-75 | 8.75  | 20.25     |

Source: World Wheat Statistics; International Wheat Council

