

PARAGUAY RURAL ENTERPRISE LOAN

Feasibility Study

G A M C O

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TABLE OF CONTENTS

I.	INTRODUCTION	1
	A. Project Background	1
	B. Observations Concerning the Stage of Development of Agricultural Cooperatives in Paraguay	3
II.	REVIEW OF SMALL FARMER INPUTS	6
	A. Personal Consumption Inputs	6
	B. "Nondurable" Production Inputs	8
	C. "Durable" Production Inputs	9
III.	REGIONAL CHARACTERISTICS OF SMALL FARMER OUTPUTS	12
	A. Regional Review of Small Farmer Outputs	12
	1. Concepción	14
	2. Canendiyú - Alto Paraná - Caaguazú	19
	3. Central - Cordillera	21
	4. Paraguari	23
	5. Guairá - Caazapá	24
	6. Misiones	26
	7. Itapúa	27
	8. San Pedro	29
	9. Chaco	30
	10. Amambay	31
IV.	POTENTIAL PROJECTS	32
	A. Short-Term Projects	32
	1. Fruit-Pulp processing Plant	33
	2. Grain Silos and Dryer	36
	3. Candy Processing Plant	36
	4. Prefabricated Storage Sheds	37
	5. Hog Breeding Complex	38
	6. Balanced Feed Mill	38
	7. Tomato and Soybean Sauce	39
	8. Balanced Feed Mill	40
	9. Yerba Mate Mill	40
	10. Grain Silos and Dryer	41
	11. Wine Processing Plant	41
	12. Conglomerate Charcoal Plant	42
	13. Pasteurized Juice Processing Plant	44

14.	Coconut Processing Plant	45
15.	Grain Silos and Dryer	46
16.	Coconut Processing Plant	47
17.	Castor Bean Oil Extraction Plant	48
18.	Tomato Processing Plant	49
19.	Fruit Juice and Pulp Processing Plant	49
20.	Corn Flour Mill	50
21.	Charcoal Processing Kilns	51
B.	Medium-Term Projects	51
1.	Tea Processing and Packaging	51
2.	Cassava Flour Mill - Rice Mill - Mint Crystals	52
3.	Dairy Plant - Work Clothes Plant - Machine Shop	52
C.	Latent Possibilities	54
1.	Villarrica - Guairá	54
2.	Coronel Oviedo - Caaguazú	54
3.	Concepción - Concepción	54
4.	San Pedro - San Pedro	54
5.	Caazapá	54
D.	Production Infrastructure Projects	55
1.	Additional Implements and Equipment	56
2.	Storage Facilities for Small Farmers	58
3.	Collapsible Wire Silos	58
4.	Prefabricated Sheds	60
E.	Constraints to the Development of Nontraditional Agroindustries in Paraguay	63
V.	ANALYSIS OF DEVELOPMENTAL CREDIT LINES AVAILABLE IN PARAGUAY	66
A.	Commercial Banks	66
B.	Banco Nacional de Fomento	67
C.	COMDESA	68
D.	Principal Constraints and Special Features of Development Finance in Paraguay	68
VI.	CONCLUSIONS AND RECOMMENDATIONS	71
A.	Necessary Loan Infrastructure	74
B.	Catalyzation of Potential Program	76
C.	Qualification Analysis of Subloans	76

TABLES

Table No. 1	- Location of Cooperatives and Membership Figures	4
Table No. 2	- Principal Personal Consumption Items Purchased by Small Farmers	7
Table No. 3	- Cooperatives that Own and Operate General Stores	8
Table No. 3A	- Cost of Principal Production Inputs for Selected Products	10
Table No. 4	- Cumulative Percentages of Small Farm Units by Region in Four Ranges	13
Table No. 5	- Percentage of Number of Hectares by Region and Product ..	15
Table No. 6	- Average Yield per Hectare by Region	16
Table No. 7	- Summary of Short-Term Projects	34
Table No. 8	- Implements that Could be Manufactured Locally	57
Table No. 9	- List of Products that can be Processed at INTN's Pilot Plant	64
Table No. 10	- Summary of Principal Characteristics of Developmental Credit Lines	69
Table No. 11	- Suggested Financial Parameters for Future Subloans	73

FIGURES

Figure No. 1	- Map of Paraguay	2
Figure No. 2	- Location of Cooperatives	5
Figure No. 3	- Daily Labor Cost by Department	11
Figure No. 4	- Geographic Distribution of Principal Agricultural Products	17
Figure No. 5	- Geographic Location of Short-Term Projects	35
Figure No. 6	- Collapsible Wire Silos	59
Figure No. 7	- Prefabricated Storage Silos	61
Figure No. 8	- Principal Actors in a National Implement Program	62

ANNEXES

Annex No. 1 - Statement and Scope of Work 78

Annex No. 2 - List of Cooperatives that were Interviewed 81

Annex No. 3 - List of Metal Working Establishments that
could Participate in the Manufacturing of
Agricultural Implements 85

I. INTRODUCTION

This report is the result of four and one-half months of research and survey work, oriented to determine the feasibility of a developmental loan project to finance industrial and services activities that would have a favorable direct impact on small farmers' income. USAID Mission to Paraguay contracted the firm GAMCO, Inc., based in Atlanta, Georgia, to carry out the research and survey tasks. GAMCO provided 27 man-months of technical and administrative personnel to the project known as "Rural Enterprises Loan". Annex No. 1 contains the statement of work, scope of work and staffing that served as the basis for the services GAMCO was contracted to perform.

A. Project Background

A review of the scope of work described in Annex No. 1 can be summarized with the following question: What types of enterprises can positively affect small farmers' income in Paraguay? In order to answer this question, the survey team visited 62 agriculture-related cooperatives in Paraguay. A detailed list of these cooperatives is presented in Annex No. 2. In addition to the cooperatives, approximately 150 interviews were held with various international and national institutions as well as with established businessmen and private investors. A special emphasis was placed in concentrating the project identification process on industries and other relevant activities that might locate in the interior, away from the Asunción area. This was assumed to be a desirable goal, since any industrial activity that takes place in the interior would have a much greater impact (social and economic) than industries that locate in Asunción.

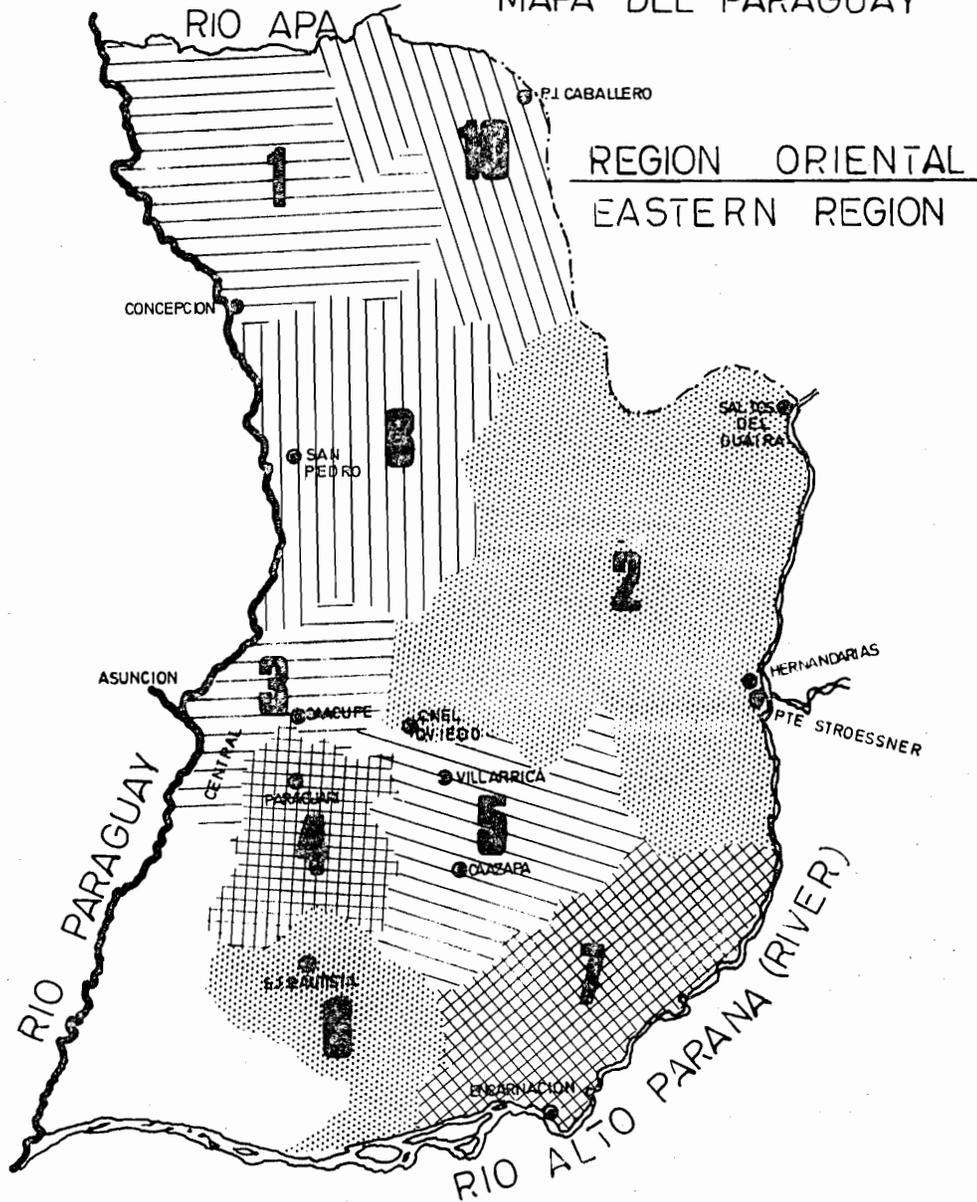
In an attempt to determine geographic characteristics and differences for the purpose of this study, the country was divided into 10 different areas, which consolidate the 19 departments that make up the political subdivisions of Paraguay. (See Figure No. 1). The basis for the determination of the 10 areas was a combination of two or more of the following factors:

- Cooperative concentration and activity (starting point)
- Similarity in terrain characteristics
- Similarity in degree of public infrastructure
- Geographic relationship to central markets
- Similarity in the types of agricultural activities

The department of Ñeembucú was visited but was not analyzed because it is primarily a cattle-breeding region. It is highly unpopulated and does not have an agricultural cooperative.

FIGURE N°1

MAP OF PARAGUAY
MAPA DEL PARAGUAY



DISTRIBUCION GEOGRAFICA - GEOGRAPHIC DISTRIBUTION

- 1_ CONCEPCION_ 2_ CANENDYU_ ALTO PARANA_ CAAGUAZU_ 3_ CENTRAL_ CORDILLERA - 4_ PARAGUARI
 5_ GUAIRA_ CAAZAPA - 6_ MISIONES - 7_ ITAPUA - 8_ SAN PEDRO - 9_ CHACO - 10_ AMAMBAY

ELABORADO POR: G A M C O I N C.

The interviews held with cooperative officials served general purposes, mainly:

- To develop data necessary to review small farmer inputs and outputs. (Sections II and III of this report).
- To understand the stage of development of the cooperative movement in Paraguay (described in the following subsection).
- To identify potential (short-and mid-term) subloan projects (Section IV).

Section V of this report reviews the development lines of credit available in Paraguay today. The last section (VI) presents conclusions and recommendations concerning the feasibility of the proposed loan project.

B. Observations Concerning the Stage of Development of the Agricultural Cooperatives in Paraguay

It is estimated by Paraguayan Government officials that there are approximately 141,000 small farmers (20 hectares or less) in Paraguay. If this figure is accepted as factual, it means that approximately only seven percent of the small farmers in Paraguay are members of cooperatives. Table No. 1 presents the number of cooperatives by region and their membership. Figure No. 2 illustrates the location of these cooperatives and their approximate area of influence (15 km. radius on the average).

The figures in Table No. 1 represent approximately 95% of the cooperatives and 98% of the cooperative membership of Paraguay. Of the total membership that appears in Table No. 1, approximately 70% is composed of small farmers. One-third of the cooperatives account for approximately 60% of the total membership in the country. Cooperatives are concentrated in the departments of Canendiyú - Alto Paraná, Chaco (mostly large farmers), and Itapúa. These same three zones are colony areas, and with some exceptions in the area of Alto Paraná, the membership is composed of immigrants: Mennonites in the Chaco, Germans and Japanese in Itapúa and Brazilians in Canendiyú - Alto Paraná. The colony areas seem to be the most responsive to cooperative efforts. This is partly explained because of the cooperative tradition of the abovementioned ethnic groups. The cooperatives in both Chaco and Itapúa are among the oldest in the country and are by far the best organized with a tendency to be vertically integrated (several industrial activities).

TABLE No. 1

LOCATION OF COOPERATIVES AND MEMBERSHIP FIGURES

<u>Zone</u>	<u>Area (Dept.)</u>	<u>Number</u>	<u>Membership</u>
I	Concepción	4	402
II	Canendiyú - Caaguazú Alto Paraná	7	2,094
III	Central - Cordillera	9	682
IV	Paraguarí	7	773
V	Guairá - Caazapá	5	289
VI	Misiones	6	549
VII	Itapúa	12	2,360
VIII	San Pedro	8	790
IX	Chaco	3	2,372
X	Amambay	3	51
<u>TOTAL</u>		<u>62</u>	<u>10,362</u>

The general opinion of the survey team was that only one-third of the cooperatives interviewed appear to have competent administration and leadership. The evidence that three of the most successful Paraguayan cooperatives are run by priests seems to indicate that the most scarce resource in the cooperative movement in Paraguay today is capable, trustworthy leadership. Small farmers, partly because of their cultural level and partly because of bad past experiences, have become a highly alienated group in many areas of the country.

In summary, the cooperative movement in Paraguay is still at an infant stage, and very likely it will be several years before a significant number of small farmers will become cooperative members. Capital, competent administration, and trustworthy leaders are the three major constraints. In practically all cases of the one-third of the cooperatives mentioned above, it was remarked that CREDICOOP is a major factor in the successful development and progress of their cooperatives.

II. REVIEW OF SMALL FARMER INPUTS

This section of the report describes the principal inputs utilized by the small farmers. The first part deals with personal consumption inputs. The second part deals with "nondurable" inputs, and the third and last part discusses the principal "durable" inputs.

A. Personal Consumption Inputs

Survey findings revealed important factors that partly explain the rather low loan recuperation rates encountered by many cooperatives. Several cooperative officials stated that the specialized nature of the cooperatives (production vs. savings and loans) had some counterproductive features. While it was generally agreed that production credits today are much more available than in past years, it was stated, however, that often the small farmer does not have enough cash to support his family and meet emergency expenditures during the average six months between crops. This situation often obliges the small farmer to deal with the acopiadores-almaceneros (general store owners who often act as middlemen of small farmer outputs). The small farmer can get cash from these middlemen, but most often he prefers to take the merchandise needed by him and his family. Several persons interviewed stated that this situation often had the following results:

- The merchants do not charge monthly interest rates on the cash they lend, but have first claim on outputs.
- Mark-ups on merchandise that are 20 - 50 percent higher than those charged for similar items in large urban centers.
- Merchants do not pay for quality differentials.

The percentage mark-up is in direct relation to the distance from large cities like Asunción and Encarnación. The maximum mark-up is found in isolated border areas like Saltos del Guairá where survey findings revealed an average mark-up over Asunción prices of 50 percent. In many areas when it rains and the dirt roads are closed, the prices of personal consumption items are doubled immediately.

Once the small farmer has accepted money and/or merchandise from the store owner, he acquires an obligation to sell his production to the store owner. It is suspected by many that some store owners do not have accurate scales for weighing the small farmers' products. Since most small farmers do not have scales of their own, they have to accept the weight measurements of the store owner. Finally, according to survey findings by the Ministry of Agriculture, in 60 percent of the cases the store owners do not pay premium prices for quality

products, but rather pay as if all the products were of a lower quality. It is difficult to ascertain to what degree these allegations are true, but many cooperative and Ministry officials made such remarks. Table No. 2 lists the main personal consumption products purchased by small farmers.

Six of the interviewed cooperatives operate stores that provide their respective members with personal consumption items as well as agricultural tools. Some of them even accept implements on consignment from Asunción agricultural equipment importers. Table No. 3 identifies these cooperatives.

TABLE No. 2

PRINCIPAL PERSONAL CONSUMPTION ITEMS PURCHASED
BY SMALL FARMERS

<u>Products</u>	<u>Current Asunción</u> <u>Baseline Prices *</u>
Sugar	34 ¢
Vegetable oil	110 ¢
Yerba Mate	30 ¢ 1/2 Kg. (packaged) 18 ¢ 1/4 Kg. " 40 ¢ Kg. (bulk)
Soap	12 ¢ bar
Salt	40 ¢ Kg.
Noodles	60 ¢ Kg.
Rice	55 ¢ Kg. (bulk) 120 ¢ Kg. (packaged-Primera)
Flour	80 ¢ Kg.
Corn	30 ¢ Kg.
Beans	48 ¢ Kg.
Starch	48 ¢ Kg.
Kerosene	35 ¢ Kg.
Galleta (type of bread)	60 ¢ Kg.
Caña blanca (rum)	80 ¢ Lt.
Guaviramí (rum)	60 ¢ Lt.

* Several of these prices fluctuate throughout the year; they are used here for illustration purposes.

TABLE No. 3

COOPERATIVES THAT OWN AND OPERATE GENERAL STORES

<u>Name of Cooperative</u>	<u>Location</u>
Colonias Unidas	Itapúa
San Luís	Itapúa
Friesland	Itapúa
La Paz	Itapúa
Volendam	San Pedro
Mennonites (all three)	Chaco

Source: GAMCO Survey

The Cooperatives listed in Table No. 3 are the best and more fully integrated (both vertically and horizontally) agricultural institutions in Paraguay. Their membership is composed of immigrants (mostly Germans) and first and second generation Paraguayans. These cooperative stores operate by extending credit to their members and receiving payment after the crops have been harvested.

It would be desirable to include as potential subloans of the Rural Enterprises Loan medium-term loans (three to four years) to develop cooperative stores. The benefits of such cooperative stores would be the following:

- Reduce the cost of personal consumption items.
- Minimize the small farmers' dealings with the almaceneros; thereby increasing the cooperatives' prospects for recuperating the production credits advanced to members.

The major constraint to establishing cooperative stores is the availability of capable and trustworthy individuals to operate such stores. Perhaps Peace Corps volunteers could train cooperative almaceneros.

B. "Nondurable" Production Inputs

The principal inputs of this type are the following:

- Seeds and/or plant stocks
- Fertilizers
- Systemic insecticides
- Contact insecticides
- Bags and boxes
- Labor

The seeds are acquired through different sources. In a few cases the cooperatives develop their own, but in most cases seeds are obtained from Servicio Nacional de Semillas through the National Development Bank. In the case of tobacco and cotton, seeds are often obtained through specific programs carried out by the Ministry of Agriculture. According to cooperative officials, these are the two most successful agricultural programs. A clear agricultural policy can be observed.

Fertilizers and insecticides are imported, and their national production is very unlikely. Cotton bags used for the collection and transport of cotton are produced in Paraguay by one textile mill. Bags are estimated to be very costly. The biggest demand is for jute bags. Jute is a material that is imported from India since there is no jute production in Paraguay.

Table No. 3A gives a detailed cost breakdown of production inputs for eight agricultural products. Figure No. 3 indicates the cost of agriculture field hand labor in eastern Paraguay. The remarkable difference between regions points out the more dynamic areas as opposed to the depressed regions where small farmers' income is, at best, marginal.

C. "Durable" Production Inputs

Agricultural tools (hoes, machetes, etc.) are usually purchased by small farmers at hardware stores in the cities or at general stores in small towns. Most tools are of Brazilian, Spanish, Argentine and, more recently, of Colombian origin. Tools are not produced in Paraguay, but presently a group of entrepreneurs is contemplating the production of such items.

The most common implements used by small farmers range from one to several of the following items:

- Plows
- Tooth harrowers

TABLE No. 3A

COST OF PRINCIPAL PRODUCTION INPUTS FOR SELECTED PRODUCTS

Inputs	Soybeans		Corn		Wheat		Irrigated Rice		Upland rice		Cotton		Tobacco		Tomatoes	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Seeds or plant stocks	50 Kg	40	20 Kg	20	100 Kg	50	150 Kg	65	35 Kg	52	25 Kg	30	25 gr	50	0.50	6,000
Fertilizers	130 Kg	43,84			80 Kg	50					225 Kg	47.42			1,650 Kg ^{3/} 3,000 Kg ^{4/}	45 2
Insecticide (systemic)					2 Kg	250	1	500			1.5 lt	500			7 lts	850
Insecticide (contact)	2 Kg	600	1 Kg	600			2	700	2	750	4	700	1	800	29	700
Fungicide					300 gr	3,000 \$/lbs							2	600	85	400
Bags	15	70	40	70	33	70	60	65	25	70	25	130				
Others	1	60						5,000 ^{1/}					0.50	200 ^{2/}	20,000 ^{5/}	1
(With Cost (Fert. per ha. (Without (Fert.	15,000				11,810						17,000				300,000	
	4,500		4,000				22,000		5,000		7,000		3,000			

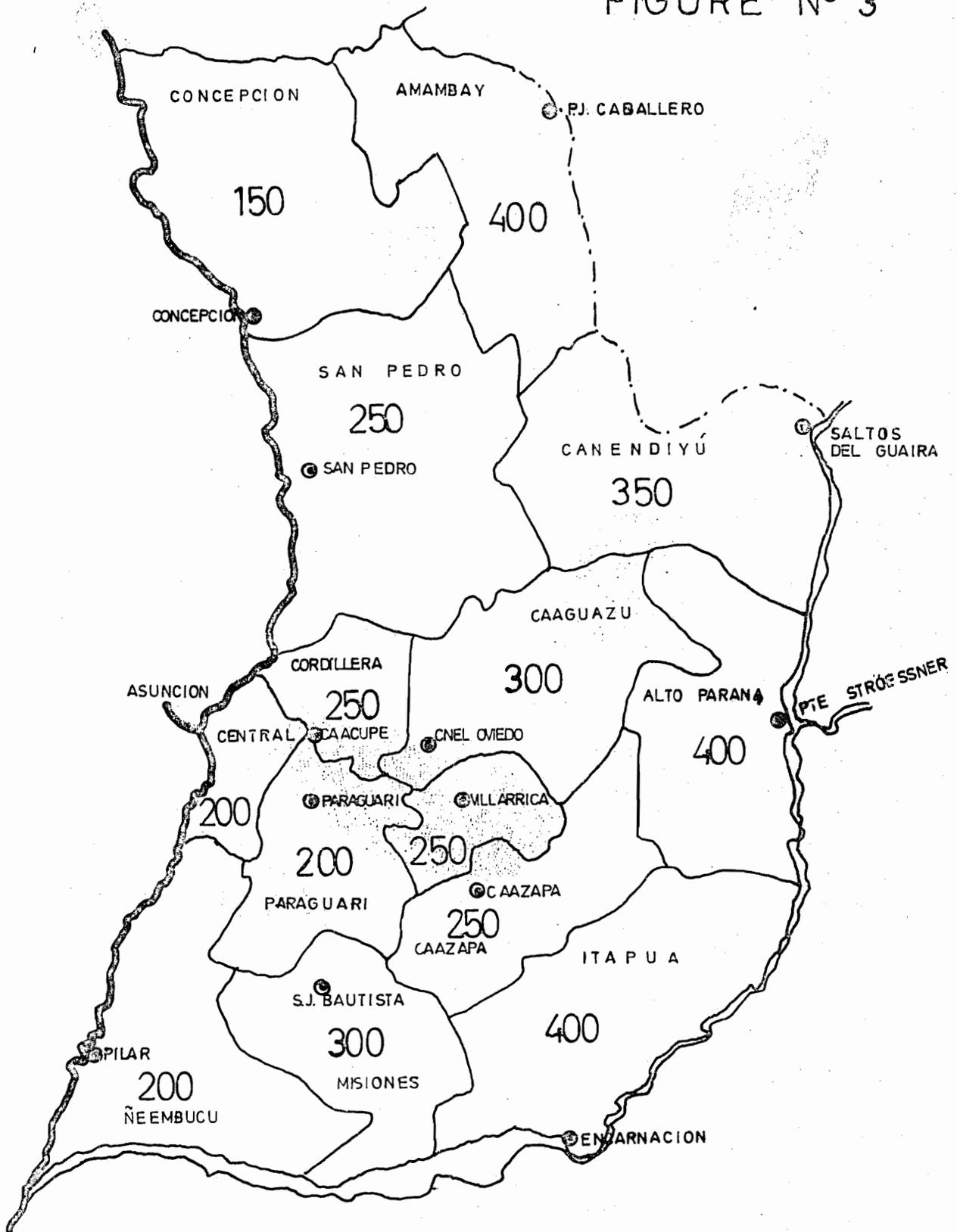
1/ Leaves Const.; 2/ Rope; 3/ Chemical fertilizer; 4/ Organic fertilizer; 5/ Sticks

Code: A: Quantity per ha.; B: Unit cost \$/kilo.

Source: Cost sheet of BNF.

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FIGURE N° 3



DAILY LABOR COST BY DEPARTMENT

ELABORADO POR GAMCO INC.
 SOURCE: COST SHEETS OF NATIONAL DEVELOPMENT BANK

(6)

Row C cultivators
Back-pack sprayers
Sprayer carts
Disk harrows
Seed fertilizer machines
Corn shellers
Threshers
Elevators
Chain saws
Fence wire (nonbarbed and barbed)

There is practically no national production of the above listed implements (except wire). However, in section IV of this report, a detailed description is given in connection with the potential feasibility of the local production of these implements. Presently, most of these implements are imported from Brazil by the National Development Bank.

III. REGIONAL CHARACTERISTICS OF SMALL FARMER OUTPUTS

Small farmers in Paraguay produce a wide range of products. In fact, with the notable exception of coffee beans, tung, and most of the wheat production, a large percentage of the rest of the agricultural production is mostly in the hands of small farmers. Table No. 4 contains a breakdown by region that indicates the distribution of small farm units in Eastern Paraguay. Studying Table No. 4, it can be observed that small farmer concentration ranges from 59 percent in region number two to 97 percent in region number three, the average being about 85 percent. Small farm units are defined as 20 hectares or less. Perhaps a more significant indicator of "smallness" is given in the third column of Table No. 4, where the percentage of farm units from zero to five hectares is found. On the 0-5 range, we observe that the concentration percentages fluctuate more, and we see that in four regions over 50 percent of the farm units have less than five hectares, indicating the location of minifundio areas.

A. Regional Review of Small Farmer Outputs

In this section a description is given of the principal characteristics of the 10 areas of interest to this study. The information presented was obtained from:

- The statistics of the Ministry of Agriculture Encuesta Agropecuaria por Muestreo 1972/1973, 1973.
- The Small Farmer Subsector Assessment, USAID Mission in Paraguay, 1975.

TABLE No. 4

CUMULATIVE PERCENTAGE OF SMALL FARM UNITS
BY REGION IN FOUR RANGES

Region	Total Number of Farm Units	Ranges (Has.)			
		0-1	0-5	0-10	0-20
I Concepción	8,652	3%	23%	41%	88%
II Alto Paraná	5,143	5	17	29	59
Caaguazú	15,267	0.7	22	47	89
Canendiyú <u>1/</u>					
III Central	13,872	16	72	89	97
Cordillera	18,760	7	54	78	92
IV Paraguari	24,962	7	54	76	91
V Guairá	14,714	12	56	73	93
Caazapá	10,591	5	45	64	88
VI Misiones	7,162	6	44	63	78
VII Itapúa	16,905	2	22	42	76
VIII San Pedro	14,775	5	25	42	85
IX Chaco <u>2/</u>	-	-	-	-	-
X Amambay	2,891	-	2	9	73

1/ Canendiyú was created in 1974.

2/ Data not available.

Source: MAG - Encuesta Agropecuaria por Muestreo, 1972

- Field interviews by GAMCO, Inc.
- Various other governmental institutions.

Table No. 5 presents a quantification (percentage) of the number of hectares within each region dedicated to the cultivation of 22 different products. It was not possible to determine how many of these hectares are in the hands of small farmers. However, we have a good idea of the relative importance of small farmer contribution to the production of these products from Tables No. 4 and No. 5. Table No. 6 presents the average yield of 19 products by region. The regional presentation given below lists the principal products of each region. Only those products that compose 10 percent or more of the national production are included in each area's description. Also, whenever the 10 percent or more types of products have a higher yield than the national averages, such characteristics are identified. Figure No. 4 shows the geographic distribution of principal crops by region.

1. CONCEPCION

Number of Cooperatives: 4

Total Membership: 402

Number of Farm Units: 8,652

Principal Agricultural Products:

Castor beans	11,300 ha.*	- 47% of national product
Corn	9,700	
Cassava	8,000*	
Cotton	5,700	
Round beans	2,000	

Area Characteristics

Concepción is clearly the most depressed area visited by the survey team. Traditionally a cattle raising area, its agricultural development is presently being constrained by a drop in price of its principal product, castor beans. Cooperative officials interviewed indicated that cotton is a promising crop for the region, given the department's climate. They also indicated that the lack of storage sheds for cotton forces the small farmers to sell at a disadvantage. Concepción's second largest agricultural product is corn. It is a traditional crop that small farmers prefer to plant, since they are knowledgeable about its cultivation. Overall corn yields

* Yield per ha. greater than national average.

TABLE No. 5

PERCENTAGE OF NUMBER OF HECTARES BY REGION AND PRODUCT

Products	Country Totals (000 Has)	R e g i o n s												
		1	2		3		4	5		6	7	8	9	10
			a	b	a	b		a	b					
Sorghum	5.5	-	4	-	9.2	-	-	-	1.8	2	-	6	76	-
Cotton	91.2	6	3	14	1	12	21	4	4	6	10	7	1	0.4
Upland rice	5.8	0.3	27	2	-	0.5	5	0.7	3	5	8	0.5	-	32
Sweet potatoes	14.3	5.3	3	17	10	11	10	6	2.5	5	6.2	6.3	2.4	-
Soybeans	81.4	-	9	3	-	-	4	3	2	12	59	2.4	-	7
Tobacco	20.4	2	11	29	1	9	10	3	9	1	1	22	-	-
Corn	192.6	5	5	11	5	8	16	7	6	4	16	8	-	3
Cassava	144.5	6	4	14	8	11	14	9	7	3	12	9.4	-	2
S. cane for sugar	17.7	-	-	3	18	-	8	60	-	-	-	-	11	-
S. cane for molasses	10.3	-	-	1	10	25	35	4	19	-	1	-	-	-
Irrigated rice	16.5	1.2	-	2	-	9	11	0.6	2	42	32	-	-	-
Onions	3.8	5	-	21	-	7	27	6	5	1	12	6	-	-
Wheat	20.3	-	2	-	-	7	10	-	-	22	36	16	-	-
Peas	3.2	4	8	4	14	29	10	6	3	1	10	6	-	0.6
Peanuts	18.0	4	1.1	16	2	11	12	3	7	2	7	6	24	2
Potatoes	0.6	-	-	18	2	18	15	3	21	-	18	-	-	-
Beans	46.6	4	3	11	6	9	17	7	8	5	12	6	-	-
Lima beans	8.4	2	14	13	3	9	2	7	7	1	16	10	-	14
Alfalfa	4.6	3	1	13	27	7	14	4	7	4	14	3	1	0.9
Castor beans	23.9	47	0.9	3	5	3	5	1	2	2	-	15	10	4
Sour Orange leaves ^{1/}	391.8	-	-	14	0.3	31.5	4.3	0.1	3	0.1	-	46.3	-	-
Mint	4.3	-	93.5	3	-	-	-	-	1.5	-	-	-	-	1.5

^{1/} Tons of essential oil prod.

Source: MAG - Encuesta Agropecuaria por Muestreo 1973

1 - Concepción
2 - a) Alto Paraná
b) Caaguazú

3 - a) Central
b) Cordillera
4 - Paraguari

5 - a) Guairá
b) Caazapá
6 - Misiones

7 - Itapúa
8 - San Pedro
9 - Chaco
10 - Amambay

TABLE No. 6

AVERAGE YIELD PER HECTARE BY REGION

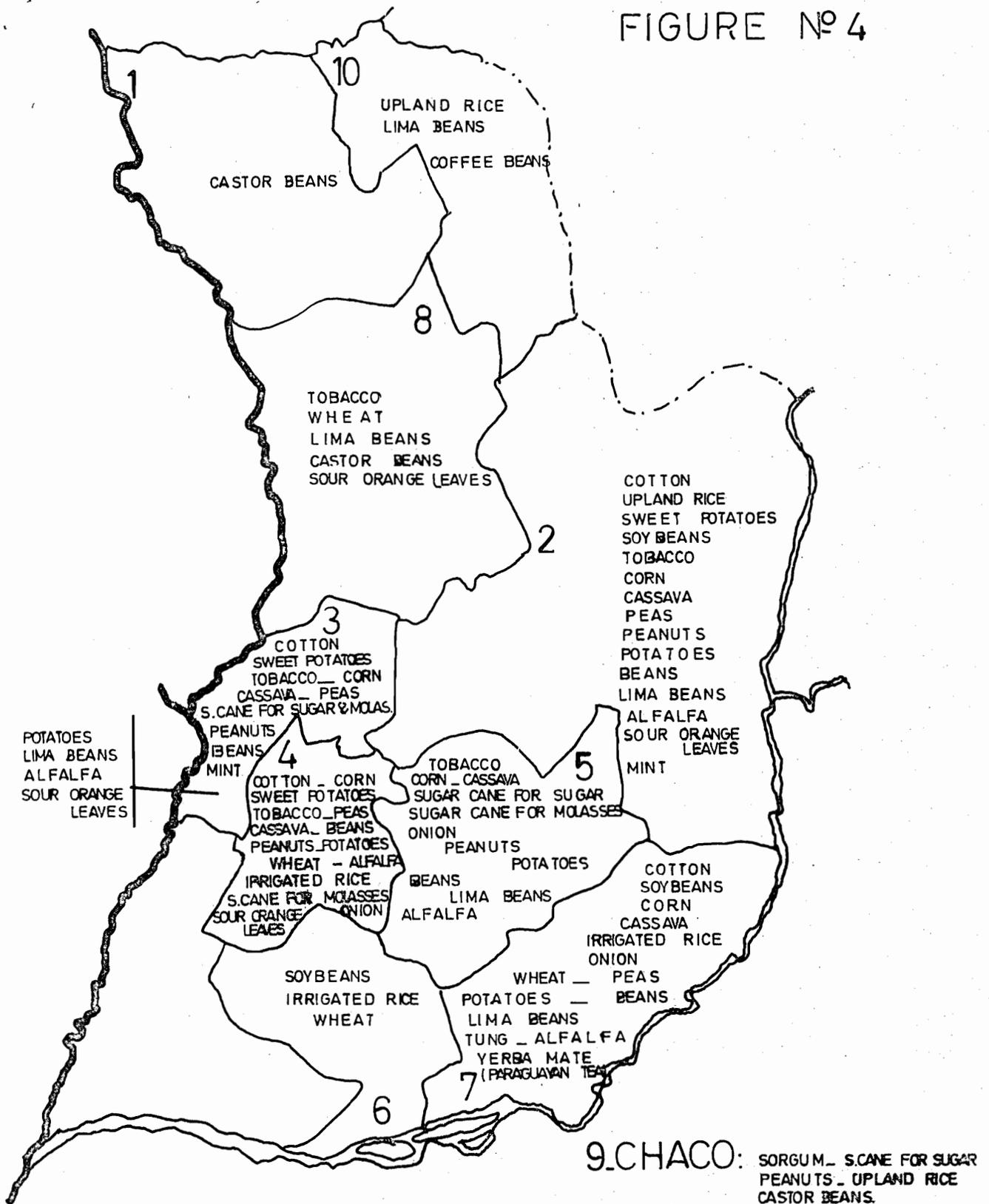
Products	Country's Average (kilos)	R e g i o n s												
		1	2		3		4	5		6	7	8	9	10
			a	b	a	b		a	b					
Cotton	1,051	958	1,125	1,020	1,044	964	1,039	1,283	915	1,159	1,268	1,129	-	974
Upland rice	1,354	870	1,314	1,122	1,200	833	875	294	1,446	1,966	1,961	600	-	1,352
Sweet potatoes	7,483	12,139	9,473	13,345	1,927	9,922	7,132	9,087	11,656	4,583	8,128	9,428	3,200	8,696
Soybeans	1,506	773	1,623	1,552	1,122	1,152	801	1,453	1,256	1,669	1,527	1,450	-	1,578
Tobacco	1,310	884	1,414	1,130	1,088	1,239	1,181	1,680	1,329	1,504	1,321	1,574	-	-
Corn	1,326	1,274	1,979	1,143	1,043	954	1,085	1,487	1,464	1,289	1,527	1,689	950	1,373
Cassava	13,914	28,813	14,653	15,865	1,500	11,640	13,972	12,804	14,037	7,809	14,914	17,146	5,101	37,638
S. cane for sugar	42,900	-	-	53,840	19,510	7,260	35,090	51,610	53,340	-	3,350	-	32,000	40,000
S. cane for molasses	33,100	20,430	20,000	15,080	4,110	34,910	35,230	23,050	49,110	44,820	8,080	54,130	28,000	-
Irrigated rice	2,162	1,127	-	4,690	-	1,416	1,959	2,339	1,526	1,810	2,772	3,263	-	-
Onions *	5,500	2,512	2,120	7,330	2,302	3,863	5,476	4,422	830	4,000	6,721	4,649	-	5,571
Wheat **	1,132	-	1,148	1,229	803	985	916	1,826	667	1,213	1,166	1,200	-	1,145
Peas	871	532	926	1,112	928	795	1,153	1,016	540	1,135	766	1,042	-	476
Peanuts	875	817	860	958	793	812	996	933	642	713	947	1,122	780	1,560
Potatoes **	6,042	-	6,500	7,022	2,833	4,318	8,050	5,600	5,296	6,666	7,000	4,000	-	8,000
Beans	788	759	880	882	966	624	727	1,034	749	743	687	935	600	630
Lima beans	849	836	1,057	874	931	547	814	1,066	614	504	821	802	-	883
Alfalfa	4,646	4,797	4,982	5,398	1,594	3,488	8,895	5,310	2,468	6,523	6,637	4,729	2,960	3,500
Castor beans	897	935	-	642	1,094	525	1,250	787	517	196	-	1,134	1,175	593

* = 1973/1974; ** = 1973

Source: MAG - Encuesta Agropecuaria por Muestreo 1972/1973

- | | | |
|--------------------|---------------|---------------|
| 1 - Concepción | 4 - Paraguari | 7 - Itapúa |
| 2 - a) Alto Paraná | 5 - a) Guairá | 8 - San Pedro |
| b) Caaguazú | b) Caazapá | 9 - Chaco |
| 3 - a) Central | 6 - Misiones | 10 - Amambay |
| b) Cordillera | | |

FIGURE Nº 4



GEOGRAPHIC DISTRIBUTION OF PRINCIPAL AGRICULTURAL PRODUCTS

are below national average by five percent, and usually draw one of the lowest prices in the nation. Cooperative leader explained that besides the castor bean prices and storage problems mentioned above, Concepción's small farmers are confronted by other problems:

- Much of the land held by small farmers was previously timberland and the presence of tree stumps and logs prohibits mechanization.
- Their geographic location and the particularly bad road system put them at a constant relative disadvantage with the rest of the nation, since the department of Concepción is the most distant from central markets.

All but one of the cooperatives interviewed, were experiencing serious financial problems because their members were not paying their financial obligations. The principal villain, according to the cooperative leaders, was the acopiador-almacenero (general store merchant). This almacenero is more successful in obtaining small farmer outputs than the cooperatives for the reasons discussed previously in Section II.A.

As shown in Figure No. 3, Concepción has the lowest wage rates for field workers. Not being a minifundio area, the low wage situation is likely to represent underemployment, as might be the case in the central area (sub-section 3 in this chapter).

This area's present situation undoubtedly merits the highest priority in the Rural Enterprises Loan. A considerable effort should be made by the institutions affected by the loan to promote any type of activity that might increase employment in this area.

Four promising projects were identified during the course of this study:

- Castor oil extraction factory
- Pasteurized juices and confectionery processing plant
- Hog breeding project
- Silo and Dryer project
- Corn flour processing plant

2. CANENDIYU - ALTO PARANA - CAAGUAZU

Number of Cooperatives: 7

Total Membership: 2,094

Number of Farm Units:

Alto Paraná: 5,143
Caaguazú : 15,267

Percentage of Small Farmers:

Alto Paraná: 54%
Caaguazú : 84%

Principal Agricultural Products: 1/

	<u>Alto Paraná</u> <u>Hectares</u>	<u>Caaguazú</u> <u>Hectares</u>	<u>Percent of</u> <u>National Product</u>
Mint	4,000	131	96
Tobacco	2,500*	6,100	39
Lima beans	1,204*	1,050	27
Onion	25	880*	22
Cotton	2,800*	15,000	20
Sweet Potatoes	366*	2,400*	19
Cassava	5,200*	21,000	18
Potatoes	2*	107*	18
Peanuts	200	2,800*	17
Corn	9,200*	22,000	16
Rice (upland)	1,600	1,500	14
Round beans	1,500*	5,000*	14
Petit-grain		55 tons	14
Alfalfa	578*	55*	14
Garlic	12	247	13
Peas	258*	134*	12
Soybeans	7,000*	3,000*	11

1/ Figures derived from 1973 Agricultural Census. In 1974 Alto Paraná was subdivided into Canendiyú. Due to extraordinary accelerated development, present figures are probably two to three times greater than those shown above, particularly for soybeans, mint, and tobacco.

* Yield per hectare greater than national average.

Area Characteristics

Second only to Itapúa in terms of present agricultural development growth, this three-department area will very likely become the most important zone within Paraguay's interior. The rationale behind the conglomeration of these three departments into one for the purpose of this study is that all three have the following similar features:

- Area of new colonizations
- Terrain - high concentration of timber land, that is very fertile once it is cleared
- Agricultural productivity being positively affected by significant migration of Brazilian farmers of Eastern European extraction
- High concentration of small farmer cooperative development
- Nearness to Brazil yields excellent alternatives to economical export logistics

The present and almost certain future economic growth of this region will shortly become Paraguay's best asset. This area has the highest potential of becoming the salvation of the small farmers of the central zone. The wages paid to field hands (see Figure No. 3) is a clear indication of the economic importance that this area is already showing. Most of the Brazilian immigrants are highly productive small farmers, and are already affecting native Paraguayan small farmers through the demonstration effect of more advanced farming technology. The isolation factor of the new colonies contributes to new cooperative development as it can be observed in the membership figures of Annex No. 2.

Interviews with cooperatives of these regions revealed the following problems:

- Impediment to full land utilization and mechanization because of tree stumps and the presence in the fields of noncommercial logs
- Too rapid growth has created an acute shortage of storage capacity

This area should have a priority ranking similar to Concepción in terms of project promotion for entirely different reasons.

The high priority ranking for Concepción would be an effort to create development, which by definition means long-term results. In this case, however, a high priority ranking is needed in order to cope with the rapid development of the zone. This area offers short-term results, and the impact of its development is much larger in magnitude because of the short-run benefit it can bring to small farmers who presently reside in several different areas of the country and who might relocate to this region. Development in Concepción, which is urgently needed, would be addressed to a smaller group of people.

Several projects were identified for the area:

- Balanced feed mill
- Milk, cheese and butter plant
- Work clothes production
- Machine shop
- Silo and dryer project
- Rice mill
- Cassava flour mill
- Mint crystals processing plant

3. CORDILLERA - CENTRAL

Number of Cooperatives: 9

Total Membership: 682

Number of Farm Units:

Cordillera: 18,760
 Central : 13,872

Percentage of Small Farmers:

Cordillera: 92%
 Central : 97%

Principal Agricultural Products:

	<u>Central</u>	<u>Cordillera</u>	<u>Percent of Nat'l Product</u>
Abacachi pineapple	640,000 $\frac{1}{2}$	11,000,000)	52
Cayena Lisa pineapple	734,000 $\frac{1}{2}$	3,700,000)	
Peas	441 ha.	929 ha.	43
Sugar cane for forage and molasses	1,000	2,600 *	35
Alfalfa	1,250		34

	<u>Central</u>	<u>Cordillera</u>	<u>Percent of Nat'l Product</u>
Petit-grain		1,235 tn.	31
Banana "carapé"	820,000 $\frac{1}{2}$	1,000,000 $\frac{1}{2}$	
Golden banana	1,600,000 $\frac{1}{2}$	675,000 $\frac{1}{2}$	27
Sweet potatoes	1,470 ha.	1,600 ha.	21
Potatoes	12	109	20
Cassava	10,900	16,200	19
Sugar cane for sugar	2,770	57	19
Round beans	3,000 *	4,000	15
Corn	9,100	16,200	13
Cotton	1,300	10,600	13
Peanut		2,000	13
Lima beans	236 *	750	12
Tobacco	300	1,800	10

$\frac{1}{2}$ / Number of plants.

* Yield per hectare greater than national average.

Area Characteristics

The small farmers in these two departments survive under a set of rather peculiar circumstances. Sixty percent of them live on farms that have an average size of three hectares. This minifundio region does not appear to have much of a future unless some drastic changes take place. There is a host of underemployment as well as unemployment. These two departments rank second lowest in terms of field hand daily wages. Despite the fact that a considerable number of Paraguay's major industries are located in this area, there is a large unemployment problem. The soils in some sectors are among the least fertile in the eastern region. Most of the cooperatives in the area have too few members to be effective. The promotion and development of horticulture could be a partial solution to the problem of the small farmers. Its proximity to Asunción already makes this region the largest producer of vegetables.

Survey findings reveal a shortage of wooden crates and boxes for the collection and transport of fruits and vegetables. Cooperative leaders complained about the high cost of wooden boxes.

Most of Paraguayan handicrafts are produced in these two departments. Survey team members contacted the new Office of Handicraft Promotion (SPA) which is part of the Ministry of Industry and Commerce. This is a new service that has been in existence for less than a year. Its work program for the promotion and development of handicrafts in this area seems to be very promising. Such a program, to be effective, requires technical assistance and financial

support to SPA. On the technical assistance side, SPA's program is a natural for Peace Corps participation. GAMCO technicians put both of these two institutions in touch and preliminary discussions concerning possible cooperation have already taken place. In addition, the following potential projects were identified:

- Fruit pulp and glazed fruit processing
- Silo and dryer project
- Candy manufacturing

There are several other potential projects in the Central Zone that are discussed in Section No. IV. These are not mentioned here because they are oriented to serve all small farmers in Paraguay (e.g. low cost intermediate technology implements) and not just these two departments.

4. PARAGUARI

Number of Cooperatives: 7

Total Membership: 773

Number of Farm Units: 24,962

Percentage of Small Farmers: 90

Principal Agricultural Products:

	<u>Hectares</u>	<u>Percent of National Product</u>
Sugar cane for molasses	3,625 *	35
Onion	1,125	27
Cotton	18,710	21
Round Beans	7,800	17
Corn	30,700	16
Potatoes	88 *	15
Alfalfa	647 *	14
Cassava	20,200 *	14
Peanuts	2,200 *	12
Rice (irrigated)	1,800	11
Tobacco	2,100	10
Wheat	2,500	10
Sweet Potatoes	1,395	10
Peas	318 *	10
Pimientos	1/	
Strawberries	1/	

1/ Data N/A. It is estimated to be similar to Central which is the other major production center.

* Yield per Ha. greater than National Average.

Area Characteristics

Paraguari is very similar to the Central Zone and Cordillera in terms of the number of small farmers; however, there are some important characteristics that tend to set Paraguari apart from the other two departments.

- Paraguari is an important sugarcane producer where there is even a sugar mill that processes the departments' total sugarcane production (400 tons).
- Its agricultural production is more diversified (less fruits versus more vegetables).
- Cooperatives appear to be more successful and one of the oldest and most efficient foreign cooperatives (La Colmena), composed of Japanese members, is based in Paraguari.
- According to cooperative officials, the lack of storage sheds is more critical, given their grain and tobacco production and the condition of their road system.
- The tomato production has reached such a level that a tomato processing project might be developed.

Paraguari, like the departments of Central and Cordillera, has a rather large percentage of small farmers who work on less than five hectares (54 percent). A businessman who has purchased and exported tomatoes from the area was identified as a potential investor for a tomato processing plant. A processing plant in the department would offer the minifundio farmers an excellent alternative to change to an intensive type of cultivation.

Cooperative officials stated that up to 20 percent of first class tobacco is lost to lower classifications due to the lack of adequate drying and storage facilities at the farm sites.

5. GUAIRA - CAAZAPA

Number of Cooperatives: 5

Total Membership: 419 *

Number of Farm Units:

Guairá : 14,714

Caazapá: 10,591

* Membership of two cooperatives was not determined.

Percentage of Small Farmers:

Guairá : 98%
Caazapá: 93%

Principal Agricultural Products:

	<u>Guairá</u> <u>Hectares</u>	<u>Caazapá</u> <u>Hectares</u>	<u>Percentage</u> <u>of Total Has.</u> <u>in Paraguay</u>
Sugar cane for sugar	11,100 *	71 *	60
Potatoes	15	108	24
Sugar cane for molasses	371	1,975	23
Cassava	12,400	9,700	16
Round beans	3,200 *	3,600	15
Lima beans	570 *	573	14
Corn	13,800 *	11,000 *	13
Tobacco	700 *	1,800	12
Onions	237	257	11
Alfalfa	187	340	11
Peanuts	600 *	1,200	10

* Yield per hectare greater than national average.

Guairá and Concepción are among the most traditional agricultural areas of Paraguay. The principal agricultural product is sugar cane which is produced almost exclusively by small farmers. Caazapá's products are more diversified than those of the department of Guairá. This latter department has promoted the introduction of potatoes, grapes, and silk worms within the last few years in an effort to diversify its agriculture production. The results have been satisfactory, but there still is a long way to go.

There are several districts in the Department of Caazapá that are known to have excellent terrain for agricultural production, but the lack of roads stops any further agricultural development.

It was learned through field interviews that in this particular area the Crédito Agrícola de Habilitación (CAH), through the formation of AUCA (Asociación de Usuarios de Crédito Agrícola), and the coordination of technical assistance from SEAG (Servicio de Extensión Agrícola) have obtained excellent results. This institutional joint effort has yielded better crop results, and a high repayment record of production credits.

The latest development effort in Guairá is the promotion of hog raising among small farmers. One of the short-term projects identified by this study (balanced feed mill) is the next necessary step before the final stage of industrialization (slaughter and packing for export). An additional advantage of this region is that it is one of the few areas that is served by the national railroad. Up to the present, this advantage has not been truly capitalized by the area, because of the lack of diversification into activities that might draw advantages by using rail service.

The Caazapá area is an excellent one for potato production, but storage sheds and a refrigerated warehouse are needed before these promising agricultural products can be further developed. The field interviews helped identify the following potential projects.

- Balanced feed ration plant
- Yerba mate mill
- Silos-dryer complex
- Expansion of wine storage and processing facility
- Charcoal processing plant
- Charcoal briquette plant

6. MISIONES

Number of Cooperatives: 5

Total Membership: 549

Number of Farm Units: 7,162

Percentage of Small Farmers: 78

Principal Agricultural Products:

	<u>Hectares</u>	<u>Percentage of Total Has. in Paraguay</u>
Irrigated rice	7,000	42
Wheat	6,000 *	23
Soybeans	12,000 *	13

* Yield per Ha. greater than National Average.

Area Characteristics

The terrain in the Department of Misiones is characterized by open fields with low gradient, which can be prepared for agricultural use at a rather low cost. Misiones is different from the new regions which have excellent soils but are rather expensive to clear due to the presence of timber. This advantage is offset by acid soils that need to be stabilized with lime.

Given Misiones' terrain characteristics and the types of agricultural products that are developed there, it is perhaps the most mechanized region in Paraguay. This mechanization is due to the presence of large agricultural units, but small farmers benefit somewhat too because there is enough equipment in the area for them to rent.

The interviews held with the local cooperatives revealed that they (cooperatives) are experiencing a low rate of recuperation of the agricultural credits they provided to their members. Similarly, the production cooperatives do not commercialize their members' crops to the rest of the country. The small farmers sell their production to almaceneros, often because of the personal consumption items problem discussed previously.

The following projects were identified in Misiones:

- Pasteurized juice processing plant
- Coconut oil extraction plant

7. ITAPUA

Number of Cooperatives: 12

Total Membership: 2,360

Number of Farm Units: 16,905

Percentage of Small Farmers: 76

Principal Agricultural Products:

	<u>Hectares</u>	<u>Percentage of Total Has. in Paraguay</u>
Tung	25,000	99
Soybeans	54,000 *	59
Wheat	9,200 *	36

	<u>Hectares</u>	<u>Percentage of Total Has. in Paraguay</u>
Irrigated rice	5,500 *	32
Potatoes	108 *	18
Lima beans	1,326	16
Corn	31,500 *	16
Alfalfa	618 *	14
Cassava	17,000 *	12
Round beans	5,700	12
Onions	482 *	12
Cotton	10,000 *	10
Peas	327	10
Yerba Mate	30,000 **	

* Yield per Ha. greater than National Average.

** The relative position is not known but it is estimated to be over 50 percent.

Area Characteristics

Itapúa is the most important agricultural area in Paraguay. Its terrain has large sections of timberland that are very fertile once cleared. It is a traditional agricultural area and has the highest incidence of cooperative organizations and development. Along with Misiones, it is one of the better mechanized zones in Paraguay. It has a relatively good road system, even though most roads are unpaved. The cooperative development is highly influenced by the concentration of people of foreign backgrounds including: Poles, Germans, Ukrainians and Japanese.

Members of the "foreign" cooperatives tend to have an average of 20 to 30 hectares. One cooperative, however, has an average of 50 to 60 hectares per member, but land utilization is about 50 percent. In this department the cooperative officials state that they have been getting excellent results in their work with the National Seed Service (SENASE).

Most "foreign" cooperatives finance 30 percent of the crop costs to their members. In most of these cooperatives the members are not obligated to sell their products through the cooperative. Those who do, receive a 10-percent advance before the products are actually sold. One cooperative expels the members if they do not sell their products through the cooperative. Almost all cooperatives have general stores for the convenience of their members. Cooperative officials remarked that the general store principle is an excellent tool to develop full cooperative integration and member participation in the pursuit of cooperative goals.

Despite the fact that Itapúa has a large silo infrastructure (both public and private), there is a shortage of storage space because production continues to grow every year.

The following projects were identified in Itapúa:

- Tomato and soybean sauce plant
- Balanced feed mill
- Hog raising project

8. SAN PEDRO

Number of Cooperatives: 8

Total Membership: 790

Number of Farm Units: 1,475

Percentage of Small Farmers: 85

Principal Agricultural Products:

		<u>Percentage of Total Has. in Paraguay</u>
Petit-grain	182 tons	46
Tobacco	4,600 has. *	22
Wheat	4,100 has. *	16
Castor beans	4,100 has. *	15
Bananas	2,170,000 trees	15
Lima beans	830 has.	10

Area Characteristics

Agricultural development in the department of San Pedro is concentrated in the areas bordering the Paraguay River, alongside the road from San Estanislao to Puerto Rosario, and the area around the capital city of San Pedro. The rest of the department does not have much agricultural activity. The department has considerable concentration of timberland areas, a feature that makes mechanization difficult even by animal traction because small farmers' lots often have many tree stumps that take several years to eliminate by the conventional method of burning.

Of the eight cooperatives, two belong to Mennonites. Their presence in the area has been a favorable one for the Paraguayan

* Yield per Ha. greater than National Average.

farmers. Small farmers have also benefited from special programs sponsored by the German Government. There is high concentration of farmers who dedicate most of their activities to bitter orange plantations. They are presently going through a difficult period due to the low prices of petit-grain essence in the international markets. Several of the cooperative officials interviewed stated that technical assistance is needed, particularly advice as to the type of products they should plant. The cultivation of potatoes has had some favorable results, even though the average yield in the department is lower than in most areas (See Table No. 6). Most of the cooperatives interviewed (other than the Mennonites) would like to commercialize their members' products, but often can not because of the lack of funds. These cooperatives can only sell the products first and pay the members afterwards. Those that have done some commercialization have done so with some very good results in terms of the prices obtained for the products. In San Pedro the people interviewed commented on the difficulties in getting their members to market their products as a group because many sell to the almaceneros. The need for storage sheds was found to be generalized all over the department. San Pedro does not have the advantage of paved roads in its territory; therefore, the transportation of products by road is costly because of the extra distance that has to be traveled to connect with the paved road system.

9. CHACO

Number of Cooperatives: 3

Total Membership: 2,372

Number of Farm Units: Unknown

Percentage of Small Farmers: Not known. The only ones that can be quantified are the Indian cooperatives, which have approximately 350 members, with an average of twenty hectares per member. There are, however, several Paraguayan small farmers in the sugar cane area near Asunción.

Principal Agricultural Products:

Sorghum	4,200 has.	76% of total has.in Paraguay
Peanuts	4,300	
Sugar cane for sugar	1,350	
Castor beans	2,500 *	

* Yield per Ha. greater than National Average.

Area Characteristics

The terrain is semi-desert, with serious water problems. Most water, when found, is deep and highly brackish. The Mennonite colonies in the Chaco are the prime representatives of highly developed cooperativism. The members are all large farmers:

Cooperative Neuland :	600 has.	average	per	member
Cooperative Ferheim :	180 has.	"	"	"
Chortitzer Komitee:	200 has.	"	"	"

There are several factories which process the members' products: three peanut oil extraction plants, a large tannin extraction factory, a large cheese and butter plant, and the only palo santo essence production plant in the world. Their cooperative general stores operate on a credit basis year around, until the members are credited for the crops they have produced. The balance remains as credit on each member's account. It is practically a cashless society.

They have organized several of the native Indians into small farmers with cooperative systems similar to theirs, including Mennonite Agricultural extension people who live with the Indians.

10. AMAMBAY

Number of Cooperatives: 2

Total Membership: 51

Number of Farm Units: 2,891

Percentage of Small Farmers: 73

Principal Agricultural Products:

	<u>Hectares</u>	<u>Percentage of Total Has. in Paraguay</u>
Coffee beans	unknown	99
Upland rice	1,900	32
Peas	1,220	14

Area Characteristics

The Amambay area is highly characterized by large timberland sectors. Its agricultural development is mostly the work of large farm units that have a high degree of mechanization. Most land clearing was done with heavy equipment; therefore, it is different in this

respect from Alto Paraná - Canendiyú, San Pedro, Concepción, and the agricultural areas in Itapúa.

One of the cooperatives is made up of Japanese members who also plant mulberry plants for the silkworm industry. The area's nearness to Brazil (dry border) permits direct commercialization with Brazil and the procurement of cheaper agricultural equipment and personal consumption items. This area is also unique in that all of the cooperative members have title to their land.

This is one of the richest regions in Paraguay with great potential for continued agricultural development. Practically all coffee production takes place in Amambay. The producers, who are generally large landholders, are organized into an association. The only problem detected through the interviews is the normal shortage of silos that is characteristic of boom areas such as Amambay. The capital city of Amambay has the largest concentration of lumber mills in one single district: 42 lumber mills in one industrial park.

IV. POTENTIAL PROJECTS

Shortly after the survey work got underway, potential industrial and service activities began to be identified in the interior. Many of these activities were at first thought to fit the criterion of affecting small farmers' income, but were later dropped from consideration because it was not clear how these industries would increment small farmers' earnings. After several more viable and direct projects were identified, it became clear that the ideal projects were the ones that are oriented towards a cooperative. In other words, the vertical and/or horizontal integration projects for cooperatives satisfy the mandate of the Rural Enterprises Loan. However, most projects that can affect small farmers' income are unlikely to fall within the technical, managerial, and capital availability of most Paraguayan cooperatives. As in most development programs, the human element is always the final constraint.

The projects that were identified fall under three categories. Following is a brief case by case discussion of each project within the three categories:

A. Short-term Projects

In this category the projects that are listed can be developed almost immediately since the identification includes entrepreneurs or cooperatives that are interested in undertaking the investments. The ultimate technical and financial feasibility of the projects would have to be developed by either the interested party or the lending institution. What has been done here is to identify, select, and

attempt to determine its impact on small farmers. It should be pointed out that the list is not finite, but rather it is a good illustration of the type of subloans that can be financed by the Rural Enterprises Loan. Undoubtedly there are more and will be more potential projects similar to the ones listed here. Table No. 7 presents a summary of the short-term projects, and Figure No. 5 illustrates the geographic location of the 21 short-term projects.

1. Fruit Pulp and Confectionery Plant

Products:

Fruit pulps, fruit candy and sweet potato pulp

Investment:

Equipment:	a. Pulp processor	\$112,640
	b. Fruit confectionery equip.	42,000
	c. Boiler	10,000
	d. Building and installation of equipment (turn-key)	<u>12,000</u>

Total Fixed Capital Investment \$176,640

Capacity:

1,300 Kg/hr.

Impact on Small Farmer:

Industrialization of sweet potatoes and fruits that grow on small farmers' fields and often do not have markets. In some areas fruits are considered a plague because they are plentiful and there is no convenient way to handle them since they have no value.

Investor:

Dr. Eduardo Martínez Riella, Plant Manager
of Industrializadora Guaraní S.A.

Plant Location:

Not determined. Depends on location economics analysis. Likely, near Central Zone (Zone III in study) Department.

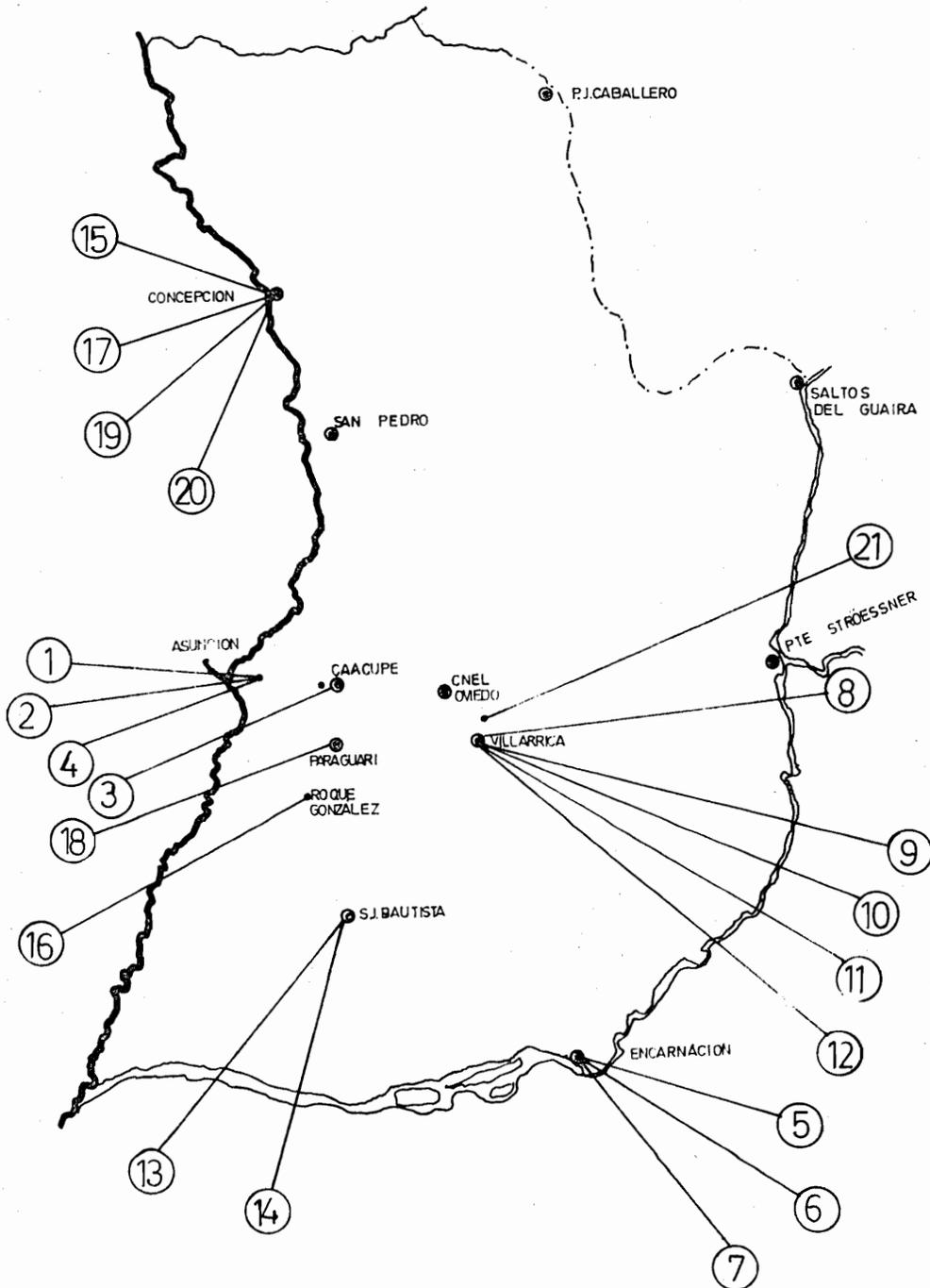
TABLE No. 7

SHORT TERM PROJECT SUMMARY

No.	Project	Location	Code	I/O Code	Investment
1.	Fruit Pulp and Confectionery Plant	Central	AB	0	\$ 176,640
2.	Grain Silos and Dryer	Central	BB	I-0	110,000
3.	Candy Processing Plant	Caacupé-Cordillera	BA	0	23,000
4.	Prefabricated Storage Sheds for Small Farmers	Asunción	BA	I	25,000
5.	Hog Breeding Complex	Encarnación-Itapúa	AB	I	50,000
6.	Balanced Feed Mill	Encarnación-Itapúa	AB	I-0	100,000
7.	Tomato and Soybean Sauce	Encarnación-Itapúa	BA	0	71,000
8.	Balanced Feed Mill	Villarrica-Guairá	BA	I-0	25,000
9.	Yerba Mate Mill	Villarrica-Guairá	BB	0	112,000
10.	Grain Silos and Dryer	Villarrica-Guairá	AA	0	95,000
11.	Wine Processing Plant	Villarrica-Guairá	BB	0	100,000
12.	Conglomerate Charcoal Plant	Villarrica-Guairá	AB	I-0	20,000
13.	Pasteurized Juice Processing Plant	S.J.Bautista-Misiones	AB	0	155,000
14.	Coconut Processing Plant	S.J.Bautista-Misiones	BA	0	80,000
15.	Grain Silos and Dryer	Concepción-Concepción	AB	0	180,000
16.	Coconut Processing Plant	Roque González-Paraguari	BA	0	105,000
17.	Castor Bean Oil Extraction Plant	Concepción-Concepción	AB	0	85,000
18.	Tomato Processing Plant	Paraguari-Paraguari	AB	0	750,000
19.	Fruit Juice and Pulp Processing Plant	Concepción-Concepción	BA	0	150,000
20.	Corn Flour Mill	Concepción-Concepción	BA	0	40,000
21.	Charcoal Processing	La Picada-Caaguazú	AB	0	24,000
					\$ 3,044,640

Code: AA: New Project for Cooperative
BB: Expansion for Cooperative
AB: New Project Private Entrepreneur
BA: Expansion Private Entrepreneur
O: Outputs Project
I: Inputs Project

FIGURE Nº5



GEOGRAPHIC LOCATION OF SHORT TERM PROJECTS

ELABORADO POR GAMCO INC.

2. Grain Silos and Dryer

Service:

Silos and dryer for corn

Investment:

Equipment: \$100,000

Capacity:

150,000 Kg/month

Investor:

Cooperativa de Avicultores

Impact on Small Farmers:

The cooperative members would buy cheaper feed mix. They would also sell corn to the cooperative. Other (nonmembers) small farmers would be selling corn to the mill also.

Location:

Asunción - Eusebio Ayala Km. 5. The place where the cooperative has its mill.

3. Candy Processing Plant

Products:

Candy made out of guayaba, milk, sweet potatoes and orange; caramel candy

Investment:

Equipment:	a. Sweet potato peeler	\$ 3,000
	b. Copper screener)	20,000
	c. Copper tank)	
	Total equipment	<u>\$23,000</u>

Investor:

Mr. Pedro S. Benítez, owner of candy factory
"La Primorosa"

Impact on Small Farmers:

Would purchase small farmers' fruits to make candy to be exported in wooden containers (boxes)

Location:

Caacupé - Cordillera Department

4. Prefabricated Storage Sheds for Small Farmers

Product:

Prefabricated sheds (American patent)

No walls so that it can be used for drying.

No roof so that small farmer could use any roofing material available to him in his area such as straw, small boards, palm leaves, etc.

Capacity:

12 units of 60 m² ea. weekly

Investment:

Small additional equipment: \$25,000

Impact on Small Farmer:

Small farmers will obtain better prices for their products because they lose quality grading by storing their outputs outside. In fact, at harvest time the farmers place as much of their production inside their houses as possible and the family has to move outside

Investor:

Rio Pozuelo S.R.L. - Asunción

Location:

Asunción

5. Hog Breeding Complex

Capacity:

8,400 hogs per year

Investment:

Buildings and necessary infrastructure \$50,000

Impact to Small Farmer:

The firm would sell 70 percent of the production to the small farmers to be fattened; then the small farmer would sell meat, not grain, and make more money. The farmer's family cares for the hogs so it can be considered a marginal activity. The last stage of this firm's strategy is to set up a slaughter and meat packing operation.

Investor:

Itapúa 333

Location:

Encarnación - Itapúa

6. Balanced Feed Mill

Product:

Balanced mix feed - composed of:

70	percent	corn
20	"	soybean expeller
5	"	wheat bread
5	"	vitamins

Capacity:

32 tons in an 8 hr. shift - 10,000 tons/year

Investment:

a.	Machinery	\$70,000
b.	Buildings	\$30,000

Impact to Small Farmer:

Sell feed to small farmer at low cost; will buy corn. In order to provide 7,000 tons of corn in a year, there would have to be 1,200 small farmers with five hectares each planted with corn.

Investor:

Itapúa 333

Location:

Encarnación - Itapúa

7. Tomato and Soybean Sauce

Products:

- Tomato sauce
- Soybean sauce
- Soybean vinegar

Investment:

Land	\$16,000
Building and warehouse	16,000
Tanks	7,000
Bottling equipment	2,500
Raw material	12,000
Oven	2,000
Warehouse for raw materials	3,500
Bottle stock	<u>12,000</u>
	\$71,000

Investor:

Hiroaki Sakanashi, owner of Sanken Kogio Plant

Location:

Encarnación - Itapúa

Impact on Small Farmer:

Small farmers will sell soybeans and tomatoes to the factory.

8. Balanced Feed Mill

Product:

Balanced feed

Investment:

Complete mill \$25,000

Impact on Small Farmers:

Small farmers will sell raw material to the mill.
Example: corn, soybeans, molasses, etc.

Investor:

Molinos Harineros del Paraguay Guairá S.R.L.

Location:

Villarrica - Guairá

9. Yerba Mate Mill

Product:

Mate tea

Investment:

- | | |
|--|----------|
| a. Warehouse to store raw materials
and milling equipment | \$32,000 |
| b. Working capital | \$80,000 |

Capacity:

800 ton/year

Impact on Small Farmers:

Presently the cooperative members sell their yerba to mills in nearby cities at a very low price. If the cooperative has its own mill, it is estimated that members would get an immediate price increase of 50 to 80 percent over what they can get from other mills.

Investor:

Cooperativa Agrícola de Producción -
Colonia Independencia

Location:

Villarrica - Guairá

10. Grain Silos and Dryer

Product:

Dry grains for export

Investment:

- a. Grain silos
- b. Dryer, elevators, generator, etc. \$95,000

Capacity:

3,000 tons storage and drying per year

Impact on Small Farmers:

The cooperative sells to exporters:

600 tons of soybeans per year
1,500 tons of corn per year

The object is to eliminate the middleman and to export directly.

Investor:

Cooperativa Independencia

Location:

Villarrica - Guairá

11. Wine Processing Plant

Products:

Wine and vinegar

Investment:

a. Building	\$24,000
b. Storage	56,000
c. Mill	8,000
d. Press (continuous)	12,000
	<u>\$100,000</u>

Capacity:

Additional 1,000,000 liters
Present capacity: 1,150,000 liters

Impact on Small Farmers:

Presently the cooperative can not accept new members because it is operating at full capacity. This expansion will permit them to increment their membership at least 50 percent. The farmers who do not belong to the cooperative sell their grapes at rather low prices to third parties. This expansion can also make possible for present members to expand their grape cultivation.

Investor:

Cooperative Ideal

Location:

Villarrica - Guairá

12. Conglomerate Charcoal Plant

Product:

Conglomerate charcoal briquettes. The bonding agent would be cassava starch.

Investment:

a. Equipment	\$16,000
b. Building	<u>4,000</u>
Total	\$20,000

Capacity:

This system is what is known in the U.S. as charcoal briquetting except that in the States a different bonding agent is used. Tests were made at the Instituto Nacional de Tecnología y Normalización and the results show an increase in calories of 300 percent per unit of weight (kilo) over the plain vegetable charcoal produced in Paraguay.

Impact on Small Farmers:

It will benefit 300 small farmers in a new colony in Guairá. The land needs to be cleared and there is a lot of wood on the property.

The market would be low income households in Villarrica and Asunción. Low income families cook with charcoal and normally use one kilo per day. The conglomerate would cost 50 percent more per kilo, but the housewife would only use one-third as much charcoal. Therefore, she would have a 50 percent savings in the cost of cooking fuel.

A third impact would be to the small farmers in Villarrica who sell cassava to the only cassava starch plant in Paraguay.

In Table No. 6 we can see that the cassava yield per hectare in Itapúa is 12.8 tons/ha. Assuming a 10 percent starch content (final), each hectare will, on the average, produce enough cassava to produce 1.2 tons of starch.

The starch requirement is 5 percent in the conglomerate process. If the plant operates at 50 percent capacity, it would produce:

$$\begin{aligned} 5 \text{ tons/hr} \times 4 \text{ hr} &= 20 \text{ tons} \\ 20 \text{ tons of charcoal} &\text{ require 1 ton of starch} \end{aligned}$$

Therefore, .85 to one hectare of cassava will be needed for each production day of the plant at 50 percent capacity. If the plant operates 250 days, there will be a need for an additional 220 to 250 hectares of cassava. In Table No. 4 we can observe that 93 percent of the farmers in Guairá have less than 20 hectares (second largest small farmer concentration department in Paraguay); 53 percent have less than five hectares. We can reasonably assume that this latter group would provide at least 80 percent of the needed cassava at the rate of one hectare per farmer. Therefore, the potential impact under this set of assumptions would be:

$$\begin{aligned} \text{Cassava farmers:} & \quad 235 \text{ hectares} \times 80\% \text{ (0-5 farmers)} \\ & = 188 \text{ 0-5 farmers (1 ha. each)} \\ & + \quad \underline{24} \text{ 5-10 farmers (2 ha. each)} \\ & \quad 212 \text{ Total cassava farmers} \end{aligned}$$

Total Impact

No. of small farmers (0-10 ha.) to provide cassava	212
No. of colonists (the colony sells 20 ha. lots)	300
No. of low income families that would have a 50 percent cost reduction on cooking fuel	20,000

Other potential benefits:

The cassava starch plant will probably have to expand (a potential subloan if it happens) and hire more people.

An increase in the availability of cassava chips which can be used for the balanced feed mix project (No. 8) in Villarrica at very low prices. This lower price in turn will have an impact on the small farmers who will buy the feed mix, etc.

Investor:

Colonel Roberto Cubas Barboza (retired)
Villarrica - Guairá

GAMCO provided a significant amount of technical reference material on conglomerate charcoal processing systems. The material was retrieved by GAMCO's linkage to technical information sources at universities in the State of Georgia.

Location:

Villarrica - Guairá

13. Pasteurized Juice Processing Plant

Products:

Pasteurized fruit juices of oranges, grapefruits, guayabas and other fruits that grow in the region, but mainly the ones mentioned above.

Capacity:

150 Lts/Hr.

80 percent to be sold bulk in containers to other processors; 20 percent to be bottled in small units for local sales.

Investment:

a. Equipment	\$130,000
b. Building	<u>25,000</u>
Total fixed investment	\$155,000

Impact to Small Farmers:

Will give an opportunity to small farmers in Misiones to sell the fruits that grow on their land, most of which are not marketed today.

Investor:

Dr. Oscar Benítez Rapetti; San Juan Bautista, Misiones
He owns an ice cream plant

Location:

San Juan Bautista - Misiones

14. Coconut Processing Plant

Products:

Separation of the four products that the Paraguayan coconut yields:

Pericarpio (outer shell)	18%	sale to feed mills
Almendra (nut)	15%	sale to vegetable oil extraction factories
Pulpa (pulp)	24%	same as above
Carozo (inner shell)	41%	sold as fuel

Capacity:

4,000 kilos of coconut per hour

Investment:

This is an expansion project. The firm has no debts.

a. Machinery	\$30,000
b. Working capital	<u>50,000</u>
Total	\$80,000

Impact on Small Farmers:

The coconut, similar to most fruits, grows wild in certain areas of eastern Paraguay. Traditionally, it has been called Paraguayan "gold" because it is often the only source of cash that small farmers have between crops. It is picked from the ground by the whole family.

When the plant operates, men and women come from all the surrounding areas by cart and even horseback to sell the coconuts that they have picked. It has not operated for one year because of a break among the partners and it is very much needed in the area. The partnership problem is now solved, but engines and other equipment are needed before it can operate again.

Investors:

Cocotera San Juan Bautista, represented by Dr. Oscar Benítez Rapetti

Location:

San Juan Bautista, Misiones

15. Grain Silos and Dryer

Service:

To store and dry corn, soybeans, round beans, and castor beans

Investment:

a. Machinery	\$50,000
b. Silos and building	<u>130,000</u>
Total	\$180,000

Capacity:

5,000 tons of storage

Impact on Small Farmers:

Presently, Concepción's small farmers are among the poorest in the country. Two large middlemen have pretty much divided the collection (acopio) business of the area by product. Small farmers have only one alternative when it comes to selling their products in the city

of Concepción. Forage facilities would provide an opportunity for the small farmer to seek competitive buyers. The investor has already stated that he would begin the system of grading products and pay higher prices for quality products. This project could be tied with the cooperatives in the area and assure that the small farmers' position is improved even more.

Investor:

Antolín Ortiz Marin

Location:

Concepción

16. Coconut Processing Plant

Product:

Separation of the four products that the Paraguayan coconut yields.

Capacity:

20,000 kilos in 8 hours

Investment:

This is an expansion project

a. Equipment	\$ 75,000
b. Building and storage	30,000
Total	\$105,000

Impact on Small Farmers:

Please see "impact" section in Project No. 14. The larger capacity will be translated into more coconuts which the small farmer and his family can sell for cash.

Investor:

Cocotera Roque González
Owner: Mr. Raul Doutrelau

Location:

Roque González, Paraguari
90 percent of Paraguari's farmers have less than 20 hectares (see Table No. 4)

17. Castor Bean Oil Extraction Plant

Product:

Castor Oil Types 1 and 3

Capacity:

a. Equipment	\$600,000
b. Building and other construction	<u>250,000</u>
Total	\$850,000

Investment:

24 tons per hour for a total extraction of 7,000/year

Impact on Small Farmer:

This project would make the most significant contribution in years to the area of Concepción.

Concepción is the largest producer of castor beans in Paraguay (see Table No. 5). It also obtains the highest yield per hectare (see Table No. 6). Grain exports have not been very profitable because of depressed grain prices. Consequently, small farmers have been getting very low prices. An oil processing plant, however, would eliminate the price disadvantage of grains because of the weight-loss factor and the higher prices of the oil; after its aggregate value has been added, castor oil demands better prices. This project can be coordinated with the cooperatives of Concepción so that they can contract production commitments and negotiate minimum prices before they cultivate. It would assure a market and good prices to the small farmers of the area.

Investor:

Antolín Ortiz Marin

Location:

Concepción

18. Tomato Processing Plant

Product:

Tomato pulp and juice

Capacity:

1,200 Kg/Hr.

Investment:

Total turn-key cost \$750,000

Impact on Small Farmer:

A project of this kind can only be implemented if the industry has an assurance that raw materials will be available in sufficient volumes. In this case, the investor needs to contract with cooperatives for the provision of tomatoes. This means that the cooperative members will have a guaranteed market and an understanding of the price ranges that will be paid for the product. The assurance of a stable market and the determination of minimum prices before planting is a very desirable feature for the small farmer. Also, the pressure of an industry of this type in a minifundio area is exactly what is needed to better utilize the small farmers' resources.

Investor:

El Paraguayo S.A.
Fenner & Hutterer

Location:

Paraguari

19. Fruit Juice and Pulp Processing Plant

Products:

Pasteurized citrus and pineapple juice,
banana, papaya and pineapple pulp

Investment:

Equipment, building turn-key cost \$150,000

Impact on Small Farmer:

Same as Project No. 13. It will provide an additional source of income to small farmers. This income will be generated by the whole family.

Investor:

Casa Bordón S.C.M. - Concepción

Location:

Concepción, Concepción

20. Corn Flour Mill

Product:

Corn flour

Investment:

This is an expansion of an existing plant

Equipment modification cost: \$40,000

Impact on Small Farmers:

This project could have a significant impact on the rest of the country. It involves the adding of corn flour to the wheat flour used for making bread. Pilot tests indicate that corn flour can be added up to a 30 percent content in the baking industry. Since Paraguay often imports wheat, this project could eventually prove that corn flour could replace thirty percent of the importation. It can also be added to noodles, therefore reducing again the wheat requirements. Since corn is a traditional crop in Paraguay, the introduction of corn flour will directly affect the small farmer. Concepción farmers would be benefitted because there will be an additional demand for corn by both the bakery and noodle industries in Concepción. Wheat costs 300 percent more than corn; therefore bread and noodle costs will be reduced.

Investors:

Industrializadora Paraguaya de Alimentos
Mr. Adolfo Laila

Location: Concepción

21. Charcoal Processing *

Product:

Charcoal

Capacity:

4 kilns with capacity for 30 m³ of wood to obtain
10 tons of charcoal per load

Investment:

Warehouse, office, kilns,
Tools and other equipment \$24,000

Impact on Small Farmers:

The investor will provide the kilns and pay the
farmers for their wood. The farmers presently
burn the wood at no economical return to them.

Investor:

Raul H. Giralá; Villarrica - Guairá

Location:

"La Picada" - Caaguazú

* This project is related to project No. 12.
The charcoal will be sold to the briquette plant.

B. Medium-Term Project

This second group of potential projects is composed of a list of activities that could also affect small farmers' income. For each one of the projects there exists an interested party, but the amount of funds necessary for each project could not be quantified since the volume of production is not yet known. It is the opinion of the survey team that none of these projects could be implemented before 18 to 24 months. However, their promotion and the study of their feasibility should be encouraged and continued.

1. Tea Processing and Packaging

This industry could have a great impact in the area of

Misiones. Some pilot experiences have been made with favorable results. The next step is to organize the small farmers and provide them with plant stocks and technical assistance. Tea is a permanent type of cultivation in that the tea plants last many years. It is labor intensive, requiring many people to collect it, which is a good feature. Every fifteen days it can be cut and collected for a period of approximately nine months during the year. The second year after it has been planted the industrial process has to take place. The project is going to be carried out by a joint venture between an Argentine tea industrialist and a Paraguayan businessman.

Location: San Juan Bautista, Misiones

Entrepreneur: Mr. Ramón Duarte,
San Juan Bautista, Misiones

2. Cassava Flour Mill - Rice Milling - Mint Crystals Processing Plant

This project involves a cooperative whose members are producers of soybeans, cassava, rice and mint. The cooperative efforts at this time are being concentrated in the storage, drying and export of soybeans.

GAMCO helped this cooperative to find financial sources that will enable to build the infrastructure necessary to handle its members' soybean crops. The next step for the cooperative is to look at vertical and horizontal integration of its members. There are three different projects and they all appear feasible: Cassava Flour Mill, Rice Mill, Mint Crystals Processing Plant.

Investor: Cooperativa de Productos Agrícolas
Saltos del Guairá

Location: Saltos del Guairá, Canendiyú

3. Dairy Plant - Work Clothes Plant - Machine Shop

In the colonization area of the department of Alto Paraná, the Cooperative Minga Guazú, headed by a priest, is the largest one in the department. The 452 members are small farmers and they have reached the stage of cooperative development that calls for horizontal and vertical integration. Three projects were identified which are oriented to increment their income:

a. Dairy Plant

Since the cooperative is beginning to provide its members with milk cows, next year it will have to plan for the

installation of a dairy complex that will produce milk, cheese and butter. This would result in more income to the farmers and better and lower-cost food products to cooperative members and to the nearby city of Pto. Pte. Stroessner. The city of Pto. Pte. Stroessner is experiencing a population boom because of the construction of the hydroelectric dam Itaipú. There should be no marketing problem for the dairy products because of the population boom.

b. Work Clothes Plant

The cooperative officials are concerned with generating employment for the large female population. Women can be offered employment in a cut and sew type of operation, which employment will help increment the income of their small farmer parents and families. There are enough workers (farmers and others) in the area to provide an ample market.

c. Machine Shop

Presently all equipment repairs have to be made in the Brazilian town of Foz do Iguazú because there are no machine shops in the Paraguayan city of Pto. Pte. Stroessner. To depend on a town in another country for repair work causes many delays. A machine shop in the cooperative is common, represents a more advanced stage of cooperative development, and, in this case, would eliminate the unnecessary delays mentioned above.

d. Hog Breeding Complex

The agricultural production of the Department of Concepción has the basic elements and climatic environment for an organized program for a hog raising complex that could sell live, fattened pigs to Brazilian markets. This project complements the short-term corn flour project. While there is interest from part of the private sector, the local cooperatives would have to participate as well.

Investor: Antolín Ortiz Marín

e. Dehydrated Vegetables

Vegetable production in Paraguay is subject to periods of surplus and deficits, depending on the seasonality of the harvests. A large entrepreneur in Guairá has interest in promoting the cultivation of various types of vegetables in the zone so that he can install a vegetable dehydration plant. This could be a very good project for the small farmers in the area and the population as a whole. The same equipment can be used to dehydrate fruit.

Investor: Mr. Fito Friedman

C. Latent Possibilities

This last category lists activities that were identified as potential subloans because their realization would have a favorable impact on small farmers. They remain latent because no entrepreneurs or cooperatives were detected as potential investors.

1. Villarrica - Guairá

Sugarcane Molasses Plant

In the Guairá area the small farmers have only the sugar mills as potential markets. The installation of sugarcane molasses plant would create the much needed competition for the small sugarcane production.

2. Coronel Oviedo - Caaguazú

Refrigerated Warehousing Units

This type of infrastructure is badly needed in this area to store potatoes and onions. Last year farmers got \$19 when they sold most of their production; a month and half later the same product was selling for \$43/kilo. This is an excellent cooperative type project.

3. Concepción - Concepción

Corn and Coconut Oil Extraction Plant

If the silo-dryer and the corn flour projects are developed, the next step is the pressing of corn oil which can be complemented with the pressing of coconut oil so that the extraction plant would operate more months throughout the year.

4. San Pedro - San Pedro

Banana Puree - Papaya Syrup Products

These two products are abundant in this region. Most of the production is wasted because it does not get collected due to the lack of markets in its raw form. The making of purée and papaya pulp could be an interesting activity in the San Pedro area.

5. Caazapá

Refrigerated Warehousing Units

The area needs this type of infrastructure. Like Caaguazú the area is a good producer of potatoes, but the lack of refrigerated storage units impares any further development of potato production.

D. Production Infrastructure Projects

A considerable amount of time was dedicated to an analysis of the national capabilities for the manufacture of minor agricultural implements (animal traction). Survey findings revealed that there are at least 18 metal working establishments in Paraguay that can contribute to the manufacturing of national implements. (See Annex NO.3). Several of these establishments have already produced minor implements, but due to reasons explained below, they have not continued to produce on a regular basis.

It was surprising to find the degree of intermediate technology already available in Paraguay, particularly in the machine shops in Encarnación, San Pedro and the Chaco; the latter two being machine shops and metal working establishments in the hands of Mennonite cooperatives.

The analysis revealed that many of these metal working establishments are capable of producing implements, but have not done so due to lack of central markets. The first constraint is the lack of capital. Most metal working establishments in Paraguay charged an advance of 50 percent of the total cost of a job in order to purchase the necessary metal raw materials which are imported products of relatively high cost. The second constraint is that practically all of these establishments do not have the administrative nor the marketing capabilities to sell implements to small farmers. Even in the cases where they would be willing to extend credit to small farmers, it would be very costly to:

- Set up a sales organization to sell these products
- Collect the installment payments
- Hold inventory stocks in the hope that customers would walk in; this would imply publicity costs, etc.

Practically all implements used by small farmers today are of Brazilian origin. They are obtained through the cooperatives, CAH, CREDICOOP, or directly through the National Development Bank. Most transactions, whether directly or through the three institutions mentioned above, are channeled through the National Development Bank, which in turn purchases this equipment through a special line of credit offered by Brazil (CACEX). Brazil offers long-term credit (eight years) and low interest (8 percent) for the sale of Brazilian products. Equipment purchases are made in large volumes, and the Development Bank delivers the implements to the cooperatives. Not much was learned about what the ultimate cost of the implement is to the small farmer, but a list of implements was analyzed, and a few items were selected as potential implements that can be manufactured in Paraguay at competitive prices and quality.

The advantages of national production of implements are the following:

- Spare parts and accessories could be obtained quickly and cheaper since they would not have to pay import duties;
- Reduction of idle time at the field while the farmer waits for the imported spare parts to come in;
- Local manufacturers can better adopt their products to their intermediate technology and to the specific needs of Paraguayan small farmers;
- A saving of foreign exchange to the nation;
- The development of an industrial sector that is basic to other sectors of the economy.

Out of nineteen different implements and tools that either the National Development Bank, CAH or CREDICOOP are procuring for small farmers, three are made in Paraguay; the rest are imported. Out of the sixteen imported implements and tools, the survey team concluded that at least seven can be manufactured nationally at competitive prices (see Table No. 8).

Economies of scale can be significant in machine shop types of operation; it is very likely that other implements could be manufactured economically if larger orders are placed. The absence of a national agricultural implement program makes it unlikely that the raw materials could be imported without taxes. However, a system of competitive bids, as suggested in the next section, would reduce the cost considerably and would help to obtain permits to import the raw materials without paying taxes.

1. Additional Implements and Equipment

It was learned during the field survey activities that small farmers do not own scales to weigh their products prior to selling; therefore, they depend on the buyers to do the weighing for them. It was also learned that there is strong suspicion on the part of some farmers that the buyers' scales might not be very accurate. Whether this is true or not could not be properly determined, but the availability of scales at the farm unit should be considered a basic tool. During the analysis of metal working establishments, a firm that manufactures small scales of 100 and 200 kilos capacity was evaluated. The 100-kilo scale costs \$1,800 and the 200-kilo scale costs \$3,000. Large orders of 100 or more would reduce the cost approximately 15 to 20 percent.

TABLE No. 8

IMPLEMENTS THAT COULD BE MANUFACTURED LOCALLY

	<u>Cost without Import Tax on R.M.</u>	<u>Cost with Import Tax on R.M.</u>	<u>Remarks</u>
Plows 10"	¢ 8,645	¢ 11,464	Imported - ¢10,340
Row crop cultivator	9,485	12,450	Imported ones are between ¢12,000 and ¢13,000
Tooth harrows	11,115	14,742	Imported range around ¢13,000
Back-pack sprayers	9,000		Imported range ¢8,000 - ¢9,000
Threshers		225,000	Imported are ¢400,000 but with more capacity. Not enough extra capacity to merit the price differential
Cart sprayers		60,000 to 75,000	There is no real competition of import equipment, but the national type is ade- quate and considered to be low cost
Water pumps		15,000	Imported vary between ¢13,000 and ¢16,500

Source: Survey of Metal Fabricating Establishments.

In Encarnación one of the metal working establishments makes a triangular-shaped tooth harrow that is especially suited for small farmer areas that have tree stumps and logs in the fields. The cost of this implement is only ¢4,000. This harrow could be used in Concepción, San Pedro, Alto Paraná and Caaguazú. Since the national production of implements has never been promoted, a lot of intermediate technology experience has never surfaced, even though it is present and could make a significant contribution towards the mechanization of small farmers.

Several of the machine shops that were evaluated were shown prints of agricultural equipment designed by the International Rice Research Institute (IRRI) and England's National Institute of Agricultural Engineering. The firms interviewed expressed a lot of interest, particularly in IRRI's grain batch dryer, and the design of an animal-drawn toolbar of the British Institute. The toolbar is a multipurpose implement that can be produced in Paraguay for approximately \$35,000. Several implements can be attached to the toolbar: plows, harrows, seeders, weeders, and others. It is truly a fine example of an intermediate-technology implement that has a great utilization potential for small farmers.

2. Storage Facilities for Small Farmers

In at least 80 percent of the field interviews, the need for storage facilities for small farmers was rated as one of the highest priorities. According to statistics of the Ministry of Agriculture, the following percentages of spoilage are representative of those that can be quantified:

	<u>Percentage of Annual Production</u>
Rice	1 to 8
Cotton	5
Peanuts	10
Soybeans	2 to 3
Tobacco	10 to 20
Castor beans	5 to 10
Wheat	2 to 4

In some areas the spoilage goes as high as 30 percent in some products. Practically all spoilage takes place at small farm units. Last year, the quantifiable spoilage amounted to approximately \$2 million. This figure does not include the losses due to the lower prices the farmer gets as a result of eroded quality.

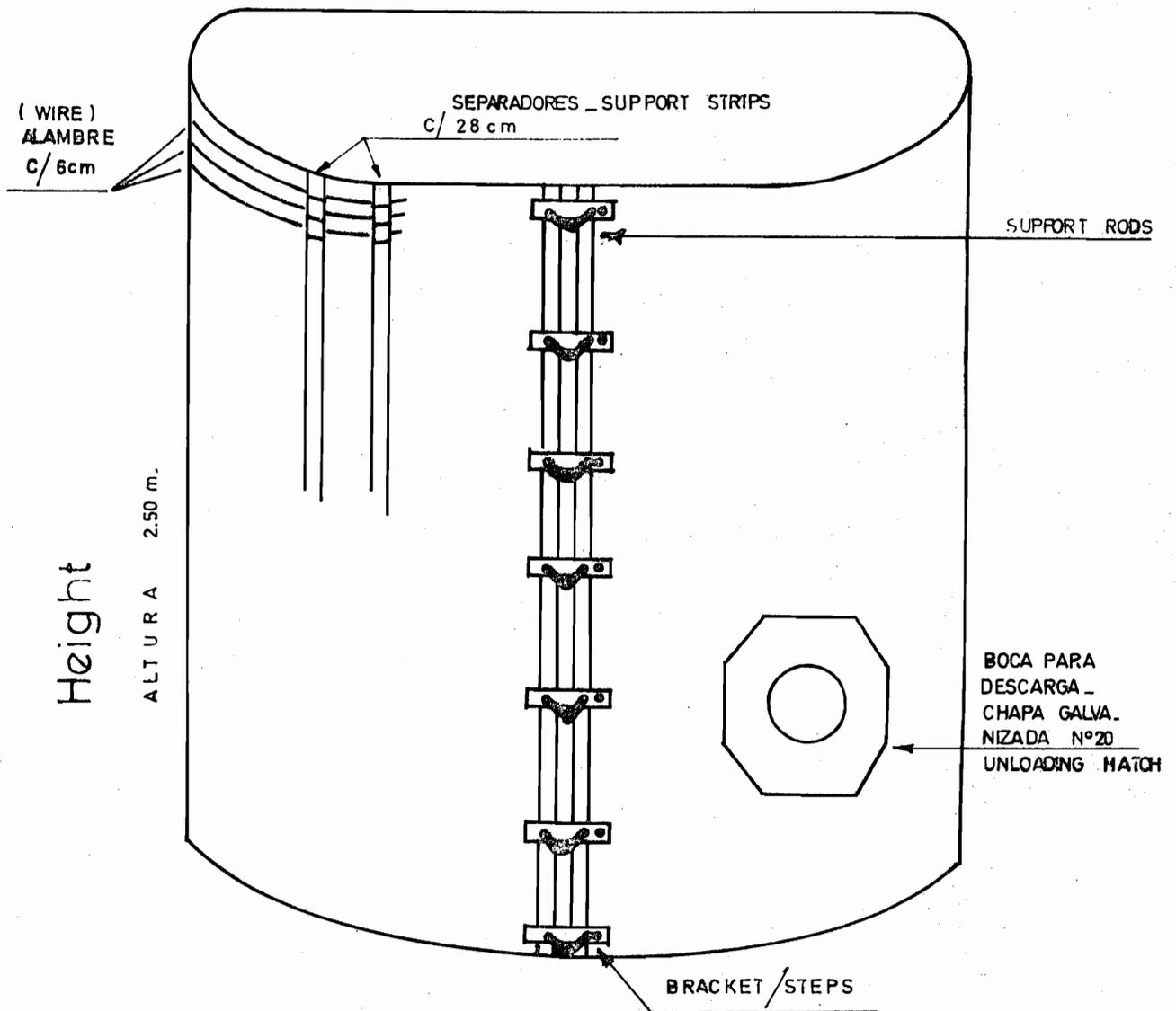
Many times it was remarked that the farmer has to sell at a disadvantage because the cooperatives do not have storage facilities, but the almacenero-acopiador does; therefore, the farmer has no choice but to sell without any bargaining power. In an effort to address part of the research work toward possible solutions to this problem two alternatives are discussed in sections 3 and 4.

3. Collapsible Wire Silos

In Figure No. 6 a drawing of a collapsible wire-bonded silo is presented. This type of silo is used in many parts of the

FIGURE N°6

COLLAPSIBLE WIRE SILO



ELABORADO POR GAMCO INC.

world as an excellent solution to temporary storage problems. Its construction, due to its simplicity, is possible in Paraguay at a cost of \$19,500 for a 10-ton unit. If several were manufactured, the cost would be even lower. All types of grain can be stored in the silos. The farmer would have to provide his own materials to cover the inside walls and the roof. He could use old plastic or textile bags or even cardboard.

4. Prefabricated Sheds

In Figure No. 7 an illustration of a prefabricated shed is presented. The cost of the shed is approximately \$50,000. Estimates show that a small farmer could pay for the shed in less than three years just from the quality price increase that he can maintain in products such as cotton, tobacco, vegetables and others. This general purpose shed can be used to store whatever implements he might own. At the present time implements and other equipment are simply left outside the house.

There are indeed a number of potential opportunities for the development of agricultural implements and machinery in Paraguay. The basic intermediate technology is present, and capital could be obtained from the Rural Enterprises Loan funds. However, there is a need for an organized effort on the part of an institution that would act as a catalyzing agent and put all the various actors together.

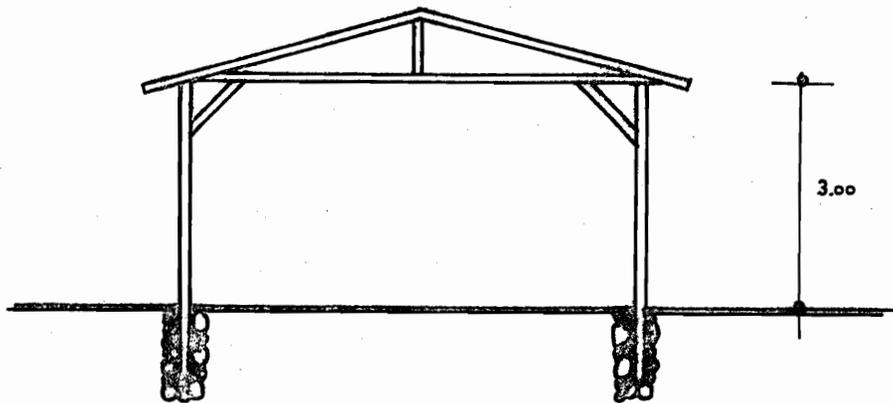
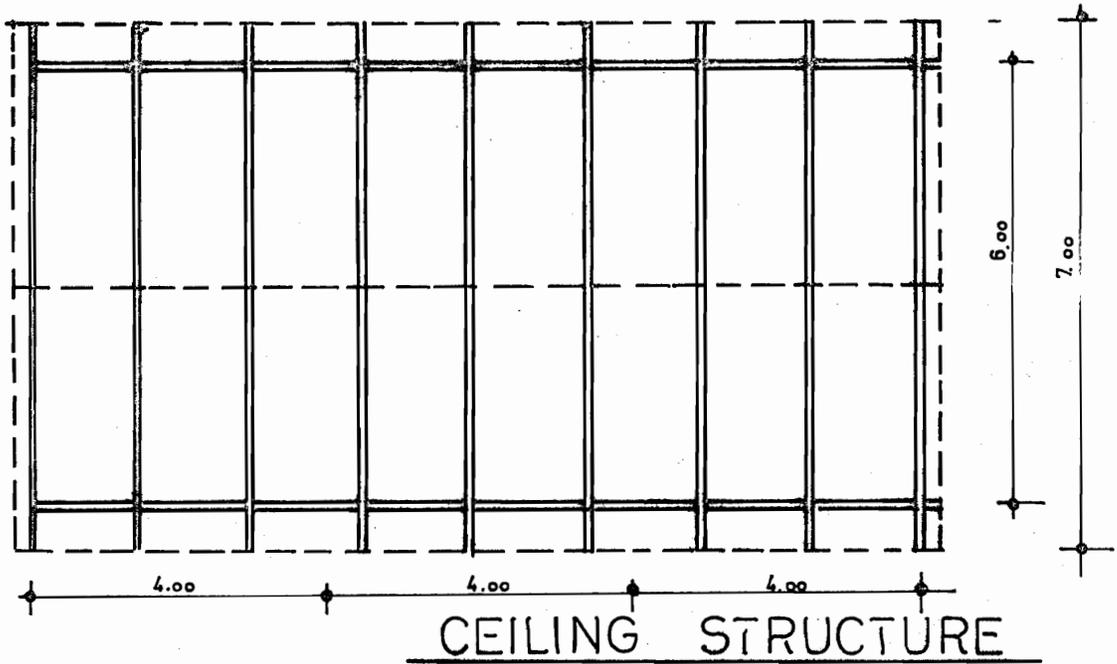
The first critical variable that needs to be developed is the willingness of either one of the three centralized markets to help this industrial sector. The three principal markets for small farm implements are: National Development Bank (BNF), Crédito Agrícola de Habitación (CAH) and CREDICOOP. Out of the three, only CREDICOOP has shown some interest in the purchase of locally manufactured intermediate technology implements.

The promoting institutions ideally should be the central market institutions, but it is unlikely that they either have the interest, time, capital and/or money to perform such functions. The ideal situation would create the flow of interrelationship described in Figure No. 8.

In some cases the first step can be avoided because there already is some experience in the manufacturing of implements. In these cases the interrelationship begins at the specification development stage. In the cases of new implements (e.g. the toolbar), the cycle begins as shown in Figure No. 8. It was estimated that approximately \$120,000 of working capital are needed to finance a three-year production plan of the eight implements listed in Table No.8, given the estimated yearly demand figures for the eight products. These figures include plow accessories as well.

FIGURE N° 7

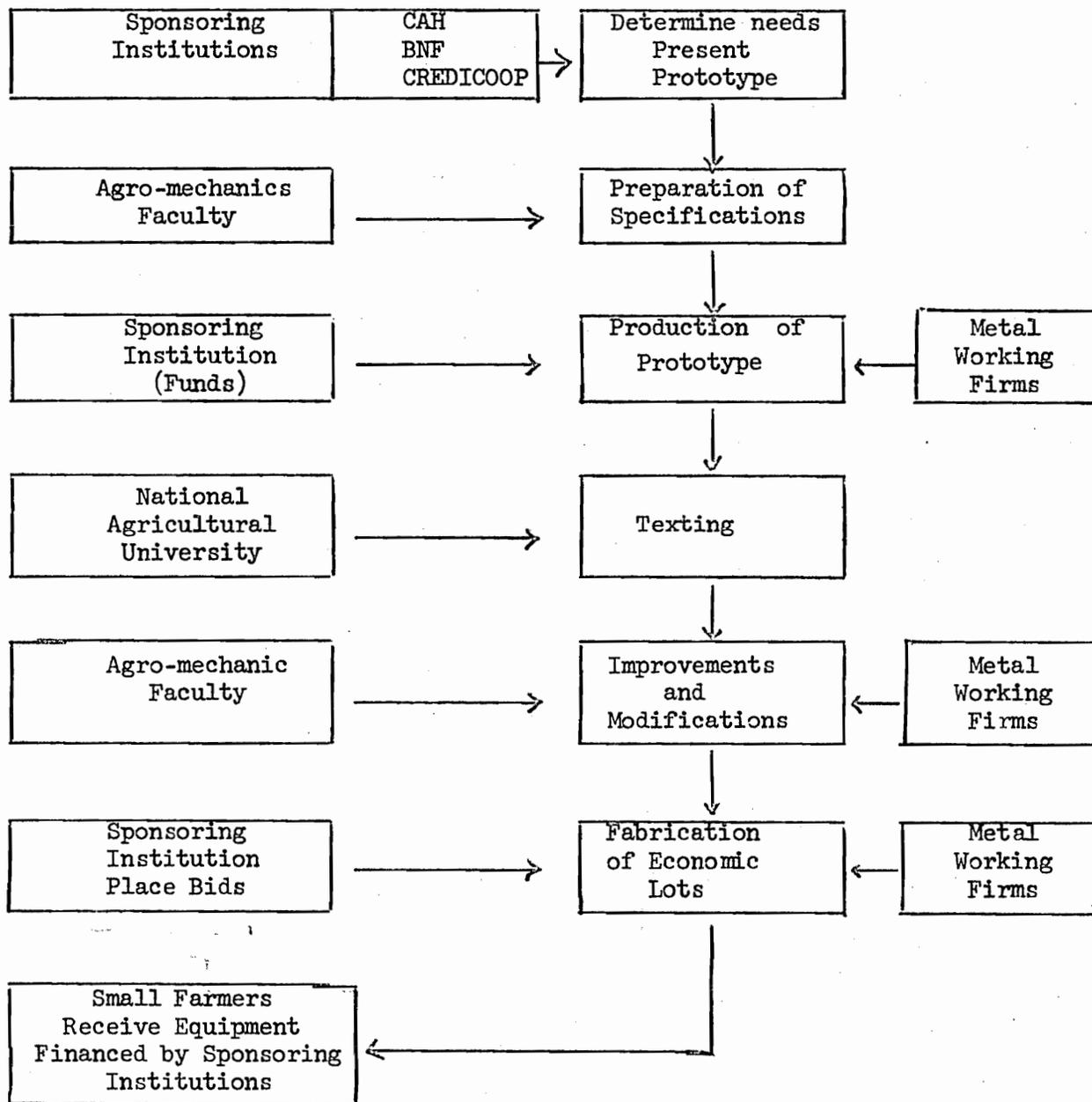
PRE-FABRICATED STORAGE SHED



SECTION

FIGURE No. 8

PRINCIPAL ACTORS IN A NATIONAL IMPLEMENTS PROGRAM



E. Constraints to the Development of Nontraditional Agro-Industries in Paraguay

Agro-industrial development, unlike popular thought, is not a simple endeavor. For the most part, what is needed is the following:

- Existence of entrepreneurs willing to invest in this activity;
- Technical knowledge of the various production alternatives;
- Availability of food technicians with laboratory experience to control quality and sanitation;
- Knowledge of markets in the micro sense, not only a macro familiarization of potential markets;
- Existence of sufficient agricultural production in certain areas so that the industry will receive enough raw materials. This normally means cooperatives contracting production with industry.
- Attractive development funds for both equipment and working capital so as to "spin-off" the sector.

In the case of Paraguay, it is very difficult to find any more than two of the abovementioned critical variables. This is particularly true in the case of vegetables.

Growing vegetables, given the "intensive" characteristics of their cultivation, is an ideal solution for the small farmers in the departments of Central, Cordillera, Paraguari and Guairá. As can be observed in Table No. 4, over 50 percent of the small farm units in these four departments have less than five hectares

The Instituto Nacional de Tecnología y Normalización (INTN) has a modern pilot plant that processes 24 different products, as can be observed in Table No. 9. The plant is very new and has hardly been used. The purpose of the plant is to train food technicians and to develop interest among the private sector in this type of production. Up to the present time, this has not been accomplished. Being aware of the constraints in Paraguay for the development of agro-industries previously mentioned, the survey team suggested to the Institute that it rent the plant to cooperatives so that the original purpose of the plant could be accomplished. The Institute's response was positive, and it was stated that INTN could receive the raw materials, would process them, and would deliver the finished product to the cooperatives. This appears to be an ideal solution because it has the following features:

- The INTN has qualified technicians whose salaries are already paid by the Government;
- The plant was donated by the U.N., therefore there are no amortization or interest charges;
- No investment other than working capital would be needed to make the first trials;
- It would break the vicious circle of farmers not producing quantities of the products on Table No. 9 because there is no industry. The potential entrepreneurs often do not invest because there is not enough production to fully utilize a minimum-size commercial plant;
- INTN cost would be only variable costs.

TABLE No. 9

LIST OF PRODUCTS THAT CAN BE PROCESSED AT INTN'S PILOT PLANT

Marmelade: Orange - Grapefruit - Tangerine
 Citrus pulp
 Tomato juice
 Tomato purée
 Whole tomato in solution (salt)
 Whole tomato (natural)
 Peeled tomatoes
 Tomato pulp
 Nectars: banana - oranges
 Strawberry - syrup and pulp
 Dehydration: green peppers - carrots - onions -
 cabbage - onion pulp - garlic pulp
 Salt: onion - garlic
 Frozen strawberry pulp
 Frozen whole strawberries

Source: Instituto Nacional de Tecnología y Normalización (INTN)

The only constraints to this proposal are to find markets and to find the cooperatives that might be willing to follow the plan. If markets (large food processing companies) are found in Brazil or Argentina, it is evident that the potential economic returns to the cooperatives would be much better than selling their vegetables fresh. It is known that there is a large potential market in the United States and Europe for dehydrated foods. What needs to be developed is individual contacts with buying firms. After a successful experience and through the demonstration effect and the availability of more trained technicians, the Paraguayan private sector would react faster to this type of business.

V. ANALYSIS OF DEVELOPMENTAL CREDIT LINES AVAILABLE IN PARAGUAY

There are three major sources of industrial development funds in Paraguay. The first and largest is the National Development Bank (BNF) which operates with IDB and German Government funds. The second is COMDESA, a private sector finance company, which operates mostly with USAID funds. The third source involves the thirteen commercial banks that operate in Paraguay.

A. Commercial Banks

The commercial banks in Paraguay operate on the basis of a reserve requirement of 42 percent of total deposits. In 1972 a law was passed by the Central Bank that ordered the commercial banks to dedicate a minimum of 50 percent of their loan portfolio to "development" loans. The same law specified that the 50 percent should be divided as follows:

- 25 percent to industry
- 20 " to exports
- 5 " to agriculture

under the following terms:

	<u>Interest Percentage</u>	<u>Commission Percentage</u>	<u>Total Percentage</u>
Loans of less than 240 days	10	2	12
Loans of 240 days to 365	10	2 1/2	12 1/2
Loans of more than 1 year	10	3	13
Commercial loans (mostly less than 1 year)	12	8 to 12	20 to 24

The difference between loans to industry and to exports is not well defined; therefore, the industry often has access to the export loans as well. The 5 percent to agriculture is used to finance the purchase of agricultural products at harvest time. Since most of this production is exported, we can conclude that practically all the development loans are export oriented.

The commercial banks, confronted with a high reserve requirement ratio, a cost of approximately 8 percent (time deposits), and an administrative cost that ranges for most banks between 4 percent to 7 percent, have a preference for export-related loans, as can be observed in the following illustration:

Case One - Guarani Loan to a Dairy Products Firm: A loan of $\text{¢}12,600,000$ ($\$100,000$) to a dairy products firm for 365 days; by law interest rate plus commission would be 13 percent. At the end of the 365 days the bank would recuperate $\text{¢}1,638,000$ or a 13 percent profit, plus the original $\text{¢}12,600,000$.

Case Two - Loan to a Lumber Mill that Exports: A 365-day $\text{¢}12,600,000$ loan to the lumber mill will be similar in terms of the profit that the bank gets from the dairy case. The difference comes when the lumber mill exports. The bank that lends the money will be handling the foreign exchange transaction of the exports. The Central Bank keeps 50 percent of the dollars that come in as a result of the shipment; the other 50 percent is kept by the bank to finance imports of its clients. When a client of the same bank wants to purchase dollars, the bank sells these dollars, but charges a 2 percent commission; therefore assuming that the lumber mill that gets the $\text{¢}12.6$ million eventually gets the bank's $\$300,000$ of foreign exchange.

13% at $\text{¢}12,600,000$	$\text{¢}1,638,000$
$\$300,000$ at 2% commission at official exchange rate $\text{¢}126/\$1$	<u>756,000</u>
	$\text{¢}2,394,000$

By giving preference to exporters in the use of this cheaper (13 percent) money, the eventual return to the bank is 19 percent because the linkage returns are higher than those of transactions not involving exporters.

The Banco do Brasil and Banco de la Nación Argentina are subsidiaries of the Central Banks of their respective countries. These two banks operate commercial banks in Paraguay, but offer long-term credit for the purchase of equipment that is manufactured in their countries. According to official figures of the Paraguayan Central Bank in December 1975, 90 percent of the development loan portfolio of commercial banks involved loans of less than one year; 5 percent, two years; and the other 5 percent over two years. The total development portfolio was approximately $\$90$ million.

B. Banco Nacional de Fomento (BNF)

The BNF was instituted in 1961 and is the only development bank in Paraguay. In October 1975, the BNF had an industrial loan portfolio of approximately $\$34$ million.

The BNF will finance only those industrial development projects that are included in the industrial priority list prepared by the National Planning Secretariat. It will finance up to 70 percent of a priority project at an interest rate of 12 percent with up to a two-year grace period. Most loans are granted for eight to ten years. After the grace period, amortizations take place every six months. BNF does not finance working capital.

The German Government extended an industrial line of credit to Paraguay that the BNF administers. The German credit is for projects that involve the purchase of German equipment. The subloans undertake currency exchange risks with German credit. This feature hurts many Paraguayan industries both when the mark revalues or when the dollar devalues. The Guarani has been traditionally tied to the dollar.

C. COMDESA

COMDESA is a widely held private finance company with an equity capital of approximately \$1.5 million. It has received \$5.5 million from USAID. Part of COMDESA's portfolio is oriented to industrial projects. COMDESA, like the BNF, can finance up to 70 percent of the total cost of an investment project.

COMDESA will finance working capital if it is part of the whole financial package of a project. Its interest rate is 12 percent for dollar loans and 14 percent for guarani loans. The dollar loans pass the currency exchange risk to the borrowers. COMDESA loans have up to a one-year grace period if the loan is for five years, and two if loans are between five and ten years. Most loans are of five to six years' duration. COMDESA began operations in 1971. In Table No. 10 a description of the available development credit lines is summarized.

D. Principal Constraints and Special Features of Development Finance in Paraguay

A development investment in Paraguay, whether it be a new industry or an expansion, has to undertake a number of cash expenditures that endangers the solvency of the project, as well as impedes the undertaking of projects by many potential entrepreneurs.

An industrial project, if of the type contained with the list of industries classified as "necessary" or "convenient" by the Technical Planning Secretariat (STP), is given a number of benefits in terms of income taxes and dispensation of import duties on equipment of foreign origin.

TABLE No. 10

SUMMARY OF MAJOR CHARACTERISTICS OF DEVELOPMENTAL CREDIT LINES

Institution	Currency Exch. Risks	Special Requirements	Terms	Interests & Commissions	Percentage Financed	Collateral Requirements
Banco do Brasil and Banco Real	Yes (US\$)	Brazilian equipment only	\$ 50,000- 2 to 3 yrs. \$100,000- 3 to 4 " \$150,000- 4 to 5 " \$200,000- 5 to 6 " \$250,000- 6 to 7 " More up to 8 yrs. Amortization: every 6 months	7% annual on unpaid balance 3% annual on unpaid balance	90% of value of equipment	Value of equipment 60% - 65% The rest real estate at a rate of 1.6/1
Banco de la Nación Argentina	Yes (US\$)	Argentine equipment only	Up to 8 1/2 yrs.	Same as above	85% of value of equipment	Same as above
Banco Nacional de Fomento (BNF)	German line only (Mark) IDB line: No	German line German equip. only; IDB line: No; only national priority projects no working capital	Up to 12 yrs. Most projects 8-10 yrs. 1-2 yrs. grace period	10 1/2 to 12%	Up to 70% of whole project	50% value of equip. 60% value of bldgs. and land; the rest real estate at a rate of 1.6/1
COMDESA	Dollar loans to purchase equip.: Yes (US\$); Guaraní loans: No	Mostly national priority projects	Up to 10 yrs.; most projects 5-6 yrs. If loan 1-5 yrs 1 yr. grace period; If 6-10 yrs., 2 yrs grace period	12% Dollar loans; 14% Guaraní loans	Up to 70% of whole project	Same as BNF
All 13 commercial banks (including the first 3 above)	No - Guaraní loans only	Agric. development Industrial dev. Export development	Up to 240 days Up to 360 days More than 360 days	10% annual plus 2% commission 10% annual plus 2 1/2% commission 10% annual plus 3% commission	-	Less than 1 yr. Usually no more Real estate or other at a rate of 1.6/1

Even when the conditions of either necessary or convenient are met, an investor has to pay 15-18 percent of the total cost of the imported equipment in border-connected taxes (nationalization expenses). Since Paraguay does not produce any capital equipment, these taxes are paid on all industrial projects. In most industries the CIF cost of equipment plus installation, on the average, make up 60 percent of the cost of a project. The border taxes, therefore, create an additional 10 percent cash expenditure over the total cost of a new project or 15 to 18 percent if it is an expansion project requiring only equipment.

In addition, there is an average 7 percent cash payment of the total amount of a development loan that has to be paid for the various administrative costs and taxes directly connected with the granting of a development loan (credit formalization expenses). The total impact of these various taxes and expenses in a new project (assuming that no import taxes are involved) is approximately 16 to 17 percent of the total amount invested; in the case of an expansion it would be 20 to 22 percent.

The willingness and benefits of BNF and COMDESA to finance up to 70 percent of the total cost of a development project, which can be considered to be a truly "developmentalist" effort, are offset by the tax burden and administrative costs that have to be undertaken. It was not possible to determine how many projects actually get financed at the debt-equity ratio of 7:3. What could be determined is that, characteristically, entrepreneurs, due to cash limitations, often tend to overvalue the construction costs and, if possible, the equipment cost, so that they can apply these "surpluses" to the 30 percent equity portion of a project. It is believed that the entrepreneurs generate the "surpluses" to pay the tax burden, and apply their own money to the wealth creative portion of the project.

The 7:3 debt-equity ratio is very dangerous in terms of the insolvency potential that is present. This is particularly true in new enterprises where almost invariably they have to experience a learning curve of two to three years' duration. If cash flow calculations in the feasibility studies are not accurate (which they normally are not, given the rather crude methods of calculation, where only point estimates are generated and no sensitivity analyses are performed), a new enterprise with no reserve capital can easily go into insolvency. This would be particularly true when investment surpluses are generated because, in effect, the true debt-equity ratio is larger than 7:3. The break-even point under such conditions is very high and in order to operate profitably under these sets of circumstances, it is necessary to lower variable costs as much as possible, the two principal components being raw materials and labor.

The protective coverage that banks obtain through the high collateral requirements (1.6/1) that is imposed on clients, takes away some of the interest for the "going concern" of the business enterprise. Among all this, it must not be forgotten that industries in Paraguay must strive for high rates of return because only 80 to 82 percent of the total investment is composed of productive (wealth creative) elements and they must also carry the burden of the tax and administrative costs discussed above.

In summary, it can be concluded that the universe of existing development entrepreneurs is largely composed of wealthy and/or land rich individuals who can meet the cash and collateral requirements imposed by the bureaucracy and the banking community.

VI. CONCLUSIONS AND RECOMMENDATIONS

Survey findings and project identification experiences indicate that the proposed loan is indeed a viable endeavor that could generate subloans that would have a direct impact on small farmers' income. The ideal projects are those that contribute towards the horizontal and vertical integration of cooperatives. However, given the present stage of development of cooperatives in Paraguay, most projects will have to be carried out by entrepreneurs.

Channeling the funds through the commercial banking system is an interesting and promising alternative. However, the true willingness of commercial banks to enter the development finance field has to be confirmed after the terms and conditions of subloans are specified. Perhaps a good indicator of what is an acceptable return to commercial banks for the administration of the subloans is a profit rate of four to five percent. Banks presently are charging 4 percent on the guarantees that they sell (offer) to clients. This means that the interest rate that commercial banks could charge to subloans should range between 9 and 12 percent without commission charges. The former rate is similar to the total rates charged by Banco do Brasil and Banco de la Nación Argentina for their equipment finance credits, and the latter is similar to rates charged by COMDESA and BNF on development projects.

The length of the subloans should be up to eight and one-half years, with a grace period of up to two years, depending on the needs of the project. Both of these recommendations are corroborated by the experience of the Banco Nacional de Fomento (see Table No. 10) and the Argentine and Brazilian banks. Working capital should be financed either as part of a project or by itself. Working capital loans that are not part of a project should be carefully evaluated and reasons should be identified as to why working capital cannot be obtained through the regular development portfolio of commercial banks. In other words, the price impact on small farmers should be demonstrated by the use of these cheaper funds. The time length for working capital loans that are not part of a project should not exceed three years.

Loans that include working capital as part of a project should finance only permanent working capital. This means working capital necessary to operate a plant up to a maximum of two months (preferably 45 days), given the plant's production output and labor and administrative expenses. To finance the complete working capital requirements of some agro-industries requires large quantities of money because a year's supply of raw materials must be purchased over a short period of time. The conventional development loans take care of that necessity.

In those cases where the required equipment is from either Brazilian and/or Argentine origin, the existing credit lines of these two countries should be used rather than USAID funds. The part that USAID funds play in such cases could be the financing of downpayments on equipment (see Table No. 10), buildings, plant sites, working capital, etc.

In terms of the percentage of a project that could be financed, the 70-30 debt-capacity ratio should be the maximum but by no means the rule. Only hardship cases should be leveraged to that extent, and only when evidence of stabilization factors like sales contracts for two or three years exists. It would be highly desirable to remove as many as possible of the taxes on new projects. The following is a list of some of the major taxes that need to be reduced to a minimum or completely eliminated. It is written in Spanish so as not to lose its legalistic meaning in a translation:

Nationalization Expenses (Gastos de Nacionalización)

- Liberación de los derechos adicionales, complementarios aduaneros.
- Recargo de cambio.
- Arancel consular.
- Impuesto en papel sellado y estampillas (párrafos 2-6-56-66).
- Artículo 27 de la Ley 1003/64.

Credit Formalization (Gastos de Formalización de Crédito)

- Ley 1003 (on capital and interest)
the 2 percent charge on Letter of Credit by commercial banks; 1 percent commission charge of Central Bank.

If Law 1003 cannot be eliminated, then the credit instrument for the handling of loans should be promisory notes and not drafts because the former is taxed at 1 percent and the latter at 1.5 percent.

Since banks will be assuming the risk for the subloans, it is naive to believe that they will not be attempting to cover themselves as much as possible. An attempt should be made to get the banks to agree to accept 70 percent of the value of equipment and other fixed assets (building and plant site) as part of the collateral package. For the remaining 30 percent, instead of the present 1.6/1 collateral rate, an attempt should be made to obtain at least a 1.25/1 rate.

The final outcome will be the result of future conversations and negotiations with the Central Bank and the commercial banks. Good financial judgment must remain, but developmental features similar to the ones suggested here should be present. Table No. 11 summarizes the suggestions described above.

TABLE No. 11

SUGGESTED FINANCIAL PARAMETERS FOR FUTURE SUBLOANS

Currency Exchange Risk	Special Requirements	Loan Period	Interest	Percentage to be Financed	Collateral Requirements
Assumed by Central Bank	Attempt to use the CACEX and Argentine Bank credit lines when applicable	8-1/2 year maximum up to two years grace period	9 to 12 percent with no commission charges	up to 70 percent including working capital	1.25/1 at least

The cooperation of the Ministry of Industry and Commerce on this program will be a desirable thing. The cooperatives already enjoy a lot of tax benefits, and many of the potential projects will fall under the category of "necessary" industries. However, it is possible that in the future some industries, while they might have a significant impact on small farmers' income, might be classified under the category of "convenient" or under no category at all. It would also be a very desirable developmental feature if the tax advantages and other exemptions afforded to "necessary" industries are automatically given to subloans of this project upon approval by the Central Bank and AID (similar to what occurs with loans financed by BNF). Perhaps the Central Bank is the best agent to deal directly with the Ministry of Industry and Commerce on this matter.

A. Necessary Loan Infrastructure

In order to assure that subloans are developed and that these are indeed the type of projects that will have an impact on small farmers' income, a team of technicians would have to be formed at the Central Bank level. Such team should be composed of two or three technical people, preferably engineers, and two economists. This team would perform three major functions:

- To promote the program by continuing the function of project identification similar to what the GAMCO team did during the course of this study.
- To evaluate subloans as they filter through the commercial banking system. They should apply the more sophisticated evaluation techniques such as internal rate of return, discounted cash flow, and, most importantly, sensitivity analyses, particularly with those subloans that are highly leveraged. It would be very desirable to acquire IBM's newest mini-computer (approximate price \$20,000) which, among other statistical features, allows one to run sensitivity analyses.
- To inspect ongoing projects to see that the functions intended are being performed. To provide technical assistance in those cases where needed in an effort to increase the probability of success. This function should be particularly welcome to the commercial banks when they are evaluating "riskier" projects. In other words, the existence of this team, if properly trained, should be viewed by the commercial banks as a risk-reduction element.

It will be up to this team to determine whether or not a project should be financed, but in all cases their justification and final decision should be approved by USAID.

It can be anticipated that there will be several projects that can have a significant impact on small farmers' income, but that the entrepreneurs, even though they meet the technical and administrative requirements necessary to carry out a project, will not qualify financially for a loan even under liberalized loan parameters. Many young professionals and small businessmen who do not have either enough cash or the collateral support necessary will be left out of the universe of potential entrepreneurs. This will probably be more true in the interior than in the Asuncion area.

The availability of qualified entrepreneurial talent is the most scarce resource in developing countries. This is particularly true in Paraguay. Often, when such talent exists, the lack of adequate

funds and/or collateral becomes an impediment to development and the enlargement of the middle class. Where available funds are not adequate, it would be an ideal developmental effort if COMDESA, as authorized by its charter and acting as a minority partner, could borrow the funds from the Central Bank and invest them as equity capital in a project. However, the project itself merits developing because of its impact on small farmers' income. The design of such strategies, assuming that COMDESA wants to participate, would have to include some kind of convertible stocks or debentures. Exercisable by the original entrepreneur and/or if traded by COMDESA, the original entrepreneurs would have first option. This is just the type of development experience that COMDESA is lacking. Its niche in the development finance system of Paraguay is not quite clear now because it largely duplicates efforts with the National Development Bank, and if this loan program is developed through the commercial banking system, its role will become even less clear.

COMDESA cannot be expected to react quickly or even favorably to such an alternative, since in addition to being understaffed, it does not have any real experience in the investment field. Its perception of risk is heavily oriented towards that of a banking agent; i.e. administering borrowed funds for a commission and not as an entrepreneurial agent. A formula would have to be derived so that in case of failure, once the commercial banks would take their coverage, COMDESA would be next (before the original entrepreneurs). If there were not enough left to fully recover the investment, then there would have to be a guarantee scheme that would cover the loss either partially or wholly. COMDESA could be the guarantor behind promising projects that are short of capital or collateral.

The advantages of such a system would be:

- Considerable enlargement of the universe of potential entrepreneurs that would make subloans.
- The commercial banks themselves would be more liberal if they knew COMDESA were a partner in certain projects.
- It would give COMDESA a niche in the development world that it is supposed to fill, but has not at the present time.
- It would give COMDESA the experience necessary within two or three years to continue making investments with its own money.
- It would act as a stabilizing agent within the project by bringing in administrative controls and methods which are necessary in any new firm and often neglected in small- and medium-size industries.

It is because of the above that this alternative should be carefully considered as opposed to providing guarantees directly to the original entrepreneur. This is only offered here as a suggestion because the loan potential goals can still be reached without this scheme, as survey findings have revealed.

B. Catalyzation of Potential Programs

As a result of survey findings and throughout this report, four programs have been suggested: national agricultural implement plants; utilization of a pilot plant at INTN; promotion of wire silos and storage sheds; and the development of cooperative general stores. All of these programs were identified as significant endeavors that address themselves to problems of magnitude.

In order to carry out such programs, an institution or a group of people needs to act as the catalyzing agent. This would be a costly effort, and at the present time the only organization that in principle seems to have some interest is CREDICOOP. It is doubtful that CREDICOOP can undertake the development of these major programs, given the human and capital resources that it presently has at its disposal. Perhaps with some additional support, it can spearhead these programs. None of the four programs mentioned above will be developed, unless someone acts as the catalyzing agent.

C. Qualification Analysis of Subloans

In determining the subloan's qualification for financing under these programs, the first and most important consideration is: How is this project going to increment small farmers' income? This important question has to be answered by the entrepreneur or cooperative that will benefit from the funds. It will be the responsibility of the evaluating team at the Central Bank to check the justification given by the interested entrepreneur or cooperative. The other project considerations should also be analyzed by the Central Bank, but this is the responsibility of the commercial banks which, after all, are the ones that are assuming the risks. Conventional evaluating techniques used by the bank are efficient and conservative in nature. The relevant question is, what impact will each project have on farmers' income? The development of a quantitative model only has some significance when the first question has been satisfied. With reference to an evaluating model, the following comments merit consideration. Small farmers' income can be incremented in three alternative ways:

- Increase the volume of his production by the addition of new markets for his products. This "volume" benefit is a form of income incrementation that assumes the farmers have more land to cultivate, or that part of their production is not being utilized.

- Better prices for his products.
- Cheaper prices for his inputs.

The impact of any of these three alternatives varies in degree, and only after a few loans are analyzed will experience indicate which alternative seems to yield the greatest benefits. Once this is known, the Central Bank team can promote this type of activity.

Another consideration to be kept in mind is that there is no control over the arrival of projects that are to be analyzed. It is not expected that many projects will be at the bank's door at one time. Each application will have to be studied on a case by case basis. The final criterion after some experience is gained would be to develop two ratios:

$$\text{Loan dollar per capita ratio} = \frac{\text{Number of farmers directly benefited}}{\text{Dollar amount of USAID funds to be used}}$$

$$\text{Loan dollar multiplier-effect ratio} = \frac{\text{Total monetary benefit to farmers}}{\text{Dollar amount of USAID funds to be used}}$$

ARTICLE I - STATEMENT OF WORK

A. Objective for Which the Technical Services are to be Used

To prepare elements of a project paper (PP) for a loan which will finance agro-industrial subprojects for small farmer infrastructure development and employment generation. The types of industries to be financed through the loan will be functional and crop-specific agro-industries but will not include traditional "infrastructure" areas such as roads or electric power.

B. Description

1. Objectives

Objectives of the proposed loan include: (a) increased agricultural processing capacity for products grown by small farmers; (b) more firms providing small farm inputs and purchasing outputs to increase geographic coverage and to encourage market competition; (c) more market opportunities for both traditional and nontraditional small farm production; and (d) job creation in labor surplus areas.

2. Methodology

Information inputs for the PP will be developed through two methods. First, the consultants will analyze available data and opinion, including the ongoing USAID/GOP Small Farmer Subsector Assessment and secondary data available in the Ministry of Agriculture and Ministry of Industry and Commerce, BID, OEA, IBRD, and local organizations such as CEPEX, CAH, and others. Second, the consultants will conduct basic exploratory research including direct interviews with institutions and industries.

C. Scope of Work

The Contractor shall provide 27.64 man months of professional, technical, and clerical personnel necessary to perform the services called for herein in the staffing pattern set forth below. This effort shall be directed towards the accomplishment of the following:

1. Analysis

a. Review of small farm inputs both for production and personal consumption and demand for inputs not readily available.

b. Review of small farm outputs including marketing arrangements and identification of problems such as transportation shortages, spoilage, etc. (To the extent possible, the consultants should obtain

information for a and b above from the Small Farmer Subsector Assessment and interviews with leaders of cooperatives. Emphasis should be placed on special characteristics and problems of the geographic areas in eastern Paraguay in which the small farmer target group is concentrated.)

c. Review of human resources including managers and skilled/unskilled labor available for the creation of new industries or the expansion of existing businesses to better serve the small farmer.

d. Identification of other constraints, in addition to shortage of capital, which inhibit development of agro-industries in Paraguay.

e. Comparative analysis of banking institutions and other sources of finance to assess the relative position of these organizations and to select the institution or institutions through which A.I.D. loan funds could be channeled.

f. Examination of the role and function of various Paraguayan organizations, including CREDICOOP and UNIPACO, in terms of their relations to agro-industries and service enterprises.

2. Development of criteria for selection of subprojects

The consultants should develop a list of criteria for the lending institution or institutions through which A.I.D. loan funds are channeled which will insure that subprojects contribute to the objectives of the loan. Criteria should reflect the following considerations:

a. Measures such as internal rate of return and sensitivity analysis for agro-industrial and service industry projects, and other indicators of subproject profitability and feasibility that can be used to evaluate projects submitted.

b. Determination that the subprojects will have a significant impact and will establish a long-term relationship with the small farmer.

c. Criteria must provide a system which will assign priority to subprojects so that they can be rank ordered in terms of a and b above.

d. The amount of imported raw materials and capital goods required should be an important factor in subproject selection, with industries using a large proportion of domestic resources receiving higher preference than those which require imports.

3. Identification of potential subprojects

The Contractor should develop a list of potential subprojects which will provide for prompt initiation of the loan project and will illustrate in the PP the types of activities which the project will finance. For each opportunity identified, the Contractor should provide the following information:

a. An estimate of the benefits to the small farmer. These benefits can be stated quantitatively, qualitatively, or a priori, depending on the nature of the opportunity and the information available.

b. The Contractor will state in detail how the benefits were calculated.

c. The Contractor will list investors interested in undertaking the subprojects identified.

ARTICLE II - STAFFING

The level of staffing for the performance of this contract shall be 27.64 total man months of direct specialized labor in the categories specified below:

<u>Number</u>	<u>Category</u>	<u>Man months</u>
1	Senior Development Specialist	4.5
1	Mechanical Engineer	4.5
2	Agricultural Engineers	9.0
1	Economist	1.5
1	Secretary	4.5
1	U.S. Industrial Engineer	3.64
	Total	<u>27.64</u>

ANNEX No. 2

LIST OF COOPERATIVES THAT WERE INTERVIEWED

<u>Zone</u>	<u>Location</u>	<u>Name</u>	<u>No. of Members</u>
I	Loreto-Concepción	Co'e Pyajhu Ltda.	240
	Loreto-Concepción	Candido Silva Ltda.	38
	Concepción-Concepción	Del Norte Ltda.	40
	Belén-Concepción	Ypané Ltda.	<u>84</u>
	Sub-Total		402
II	Saltos del Guairá-Canendiyú	COPASAGU	343
	Hernandarias-Alto Paraná	Palma Ltda.	15
	P.P.Stroessner-Alto Paraná	Minga Guazú	452
	J.E.O'Leary-Alto Paraná	J.E.O'Leary Ltda.	240
	Hernandarias-Alto Paraná	Mayor Alfredo Plá	220
	Colonia Yguazú-Alto Paraná	Takushin Yopaira	140
	Cnel. Oviedo-Caaguazú	Cnel. Oviedo Ltda.	<u>684</u>
	Sub-Total		2,094
III	Capiatá-Central	Hortifrut Ltda.	20
	Capiatá-Central	Asuncena-San Blás	27
	Capiatá-Central	Ybyraró Ltda.	25
	Piraretá-Cordillera	Moisés Bertoni	8
	Itacurubí-Cordillera	Itacurubí Ltda.	97
	Caraguatay-Cordillera	Caraguatay Ltda.	26
	Caraguatay-Cordillera	Promoción Ltda.	370
	E.Ayala-Cordillera	La Barrereña Ltda.	<u>109</u>
	Sub-Total		682

<u>Zone</u>	<u>Location</u>	<u>Name</u>	<u>No. of Members</u>
IV	Yaguarón-Paraguari	San Buenaventura	18
	Yaguarón-Paraguari	Yaguarón Ltda.	171
	La Colmena-Paraguari	La Colmena	52
	Acahay-Paraguari	Acahay Ltda.	87
	Carapeguá-Paraguari	Carapeguá Ltda.	150
	Paraguari-Paraguari	Paraguari Ltda.	125
	Quiindy-Paraguari	Quiindy Ltda.	<u>170</u>
	Sub-Total		773
V	Villarrica-Guairá	Ideal Ltda.	85
	Villarrica-Guairá	Independencia	45
	Iturbe-Guairá	Santa Clara Ltda.	* /
	Buena Vista-Caazapá	El Progreso Ltda.	* /
	Yuty-Caazapá	Yuty Ltda.	<u>289</u>
	Sub-Total		419
VI	San Ignacio-Misiones	Segunda Coop. Triguera	35
	San Ignacio-Misiones	Misionera Ltda.	21
	San Ignacio-Misiones	San Ignacio Ltda.	374
	San Juan Bautista-Misiones	San Juan Bta. Ltda.	<u>119</u>
	Sub-Total		549

* / Membership was never properly determined.

<u>Zone</u>	<u>Location</u>	<u>Name</u>	<u>No. of Members</u>
VII	Obligado-Itapúa	Colonias Unidas	829
	Encarnación-Itapúa	Del Sur Ltda.	240
	Carmen del Paraná-Itapúa	Carmeña Ltda.	170
	San Luís-Itapúa	San Luís Ltda.	152
	Cnel. Bogado-Itapúa	Cnel. Bogado Ltda.	206
	Fram-Itapúa	Apereá Ltda.	30
	Fram-Itapúa	Fram Agrícola Ltda.	226
	Pirapó-Itapúa	Pirapó Agrícola Ltda.	300
	Capitán Miranda-Itapúa	Capitán Miranda Ltda.	44
	"	Cerrito Ltda.	70
	"	Ing. Agr. H. Bertoni	53
	"	Agrícola Pioner	40
	Sub-Total		2,360
VIII	San Pedro-San Pedro	Trigenar Ltda.	13
	Itacurubí del Rosario-San Pedro	Itacurubí del Rosario Ltda	33
	Volendam	Volendam	160
	Villa del Rosario-San Pedro	Villa del Rosario Ltda	120
	Pto. Rosario-San Pedro	La Rosarina	80
	Friesland	Friesland	196
	San Pedro-San Pedro	Norteña San Agustín	130
	San Pedro-San Pedro	San Pedro de Ycuá-mandiyú	58
	Sub-Total		790

<u>Zone</u>	<u>Location</u>	<u>Name</u>	<u>No. of Members</u>
IX	Chaco	Ferheim	800
	Chaco	Neuland	172
	Chaco	Chortitzer Komitee	<u>1,400</u>
	Sub-Total		2,372
X	Pedro J. Caballero-Amambay	Aquidabán Ltda.	14
	Pedro J. Caballero-Amambay	Amambay-Agrícola Ltda.	<u>37</u>
	Sub-Total		51

S U M M A R Y

<u>Zone</u>		<u>No. of Cooperatives</u>	<u>Membership</u>
I	Concepción	4	402
II	Canendiyú-Alto Paraná Caaguazú	7	2,094
III	Central Cordillera	9	682
IV	Paraguarí	7	773
V	Guairá-Caazapá	5	289
VI	Misiones	5	549
VII	Itapúa	12	2,360
VIII	San Pedro	8	790
IX	Chaco	3	2,372
X	Amambay	2	<u>51</u>
	Total Membership		<u><u>10,362</u></u>

ANNEX No. 3

LIST OF METAL WORKING ESTABLISHMENTS THAT COULD PARTICIPATE
IN THE MANUFACTURING OF AGRICULTURAL IMPLEMENTS

- 1 - Victor Koop - Asunción
- 2 - Fundería Milán - Asunción
- 3 - M/M - Asunción
- 4 - Astillero San Isidro S.A. - Asunción
- 5 - Industrias Ybycuí - Asunción
- 6 - Fabrimet - Fernando de la Mora (Asunción)
- 7 - Agrometal - Asunción
- 8 - Taller 14 de Julio - Asunción
- 9 - Talleres Gadea - Asunción
- 10 - Talleres Borgman - Friesland
- 11 - La Agrícola - Encarnación
- 12 - Taller Cooperativa Colón (Chortitzer) Chaco
- 13 - Industria Metalúrgica Horst Marteus - Chaco
- 14 - Fidelin Varela - San Ignacio
- 15 - Heriberto Schebella - Encarnación
- 16 - Taller Andrés Riecan - Carmen del Paraná
- 17 - Super Básculas Longhino S.R.L., Villarrica - Guairá
- 18 - Jorge Paredes Cabello - Asunción

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