

PO-AAU-395 99  
ISN = 47353

MARKETING ASPECTS TO SUPPORT DEVELOPMENT OF  
THE CHAPARE IRDP PID

Prepared for USAID, La Paz, Bolivia

Project Number : 511-0000.01

Contract Number: 511-0000-S-00-2005

Michael S. Hanrahan  
Crops Marketing Advisor

La Paz, Bolivia  
March 31, 1982

MARKETING ASPECTS TO SUPPORT DEVELOPMENT  
OF THE CHAPARE IRDP PID

TABLE OF CONTENTS

		Page
I.	INTRODUCTION	1
	Summary Table	2a
II.	MARKETING AND PID DEVELOPMENT	3
	A. CACAO	3
	1. Summary of Marketing Considerations	3
	2. Discussion	4
	3. Documents and Persons Consulted	7
	B. TEA	8
	1. Summary of Marketing Considerations	8
	2. Discussion	10
	3. Documents and Persons Consulted	12
	C. Rubber	13
	1. Summary of Marketing Considerations	13
	2. Discussion	13
	3. Documents and Persons Consulted	15
	D. BLACK PEPPER ( <u>Piper Nigrum</u> )	15
	1. Summary of Marketing Considerations	15
	2. Discussion	17
	3. Documents and Persons Consulted	18
	E. PINEAPPLE, PALM HEART, AND PASSION FRUIT CANNING	18
	1. Summary of Marketing Considerations	18
	2. Discussion	20
	3. Documents and Persons Consulted	22
	F. ORANGES	23
	1. Summary of Marketing Considerations	23
	2. Discussion	23
	3. Documents and Persons Consulted	24
	G. BANANAS	25
	1. Background	25
	2. The Report	25
	a. Scope of Work	26
	3. Report Cost	29
	4. Documents and Persons Consulted	29

	<u>Page</u>
H. BRAZIL AND MACADAMIA NUTS	29
1. Summary and Marketing Considerations	29
2. Market Background	30
3. Documents and Persons Consulted	30
I. RICE	31
1. Summary of Marketing Considerations	31
2. Discussion	32
3. Estimate of Project Cost	34
4. Documents and Persons Consulted	35
J. BANANA AND YUCCA DEHYDRATING	35
1. Background	35
2. The Study	35
a. Scope of Work for Engineering Services	36
b. Scope of Work for Economic and Agronomy Services	38
3. Provisional Estimate of First Investment Costs	39
4. Documents and Persons Consulted	40
K. INPUT SUPPLY	40
a. Recommendation	40
b. Documents and Persons Consulted	41
II. OTHER MARKETING TOPICS	41
A. PRICE AND VOLUME DATA	41
1. Background	41
2. Project Activity	41
3. Documents and Persons Consulted	43
B. THE MARKETING ROLE OF PRODES	43

\* \* \* \* \*

\* \*

\*

- / -

MARKETING ASPECTS TO SUPPORT DEVELOPMENT OF THE  
CHAPARE IRDP PID

1. INTRODUCTION

USAID/La Paz is preparing both a PID and a Project Paper for a Chapare Integrated Rural Development Project (IRDP). The PID has been outlined. Technical assistance was seen as necessary in economics, agronomy-soils, agricultural marketing, and perhaps other areas.

This report covers agroindustrial and agricultural marketing aspects in support of the development of the Chapare IRDP PID. Report content is defined in the project contract, and was refined in a report outline and memo prepared and distributed in USAID/La Paz on March 10, 1982. At that time, the commodities to be included were defined as cacao, tea, rubber, orange juice, pejivalle, bananas, pineapple, rice, nuts, pepper, and passion fruit. Marketing information on these commodities was to be summarized from available existing reports. A limited number of interviews with companies marketing these commodities was to be held. As the project developed, three new topics were added to the list contained in the March 10 memo. These were the dehydration of bananas and kudzu the organization of input supply in campesino-operated central input stores; role of PRODES in marketing.

The marketing information presented addresses the following points: what is the near term market size, or potential, for the listed commodities, considering both internal and external markets? What product specifications are required? How many farmers and hectares can be included under each crop? To whom will products be sold? Which institution will implement the project? What supporting services, such as rural access roads or rural power supply, will the marketing activity require? When can the project be implemented? In addition, a very brief description of each recommended processing activity is included.

For each commodity, any activities that it will be possible to develop during the next twelve months are identified. For cacao, tea, black pepper and fruit canning, this means the immediate initiation of the continuance of production and processing activities. For bananas, rice, dehydration, and the organization of input supply and product sales, this means further marketing research, which is expected, for rice and input supply, to lead to near-term project activity. The possible expansions of project activities begun during the first year are outlined through 1986. When possible, estimates are made for investments that may be required upon the conclusion of market studies. Finally, oranges, nuts and rubber are identified as commodities where no agricultural or agro-industrial marketing activities will be possible until 1987 or later.

Summarizing across commodities, a number of general constraints have been identified, as follows:

1. Volume product flows in uniform, even quality and are absent in all raw products except bananas. This means that production projects must precede or go together with any marketing activities.
2. In all commodities, very large volumes of raw product purchasing capital will be required. It is unlikely that these funds will be available from commercial banks or from the GOB.
3. Technical assistance will be requisite in all production and marketing activities. Bolivians, and not expatriates, can and should provide this.
4. Rural access roads are necessary to support the agroindustrialization of cacao, tea, pineapple, palm harts, passion fruit, bananas, and rice marketing.
5. Rural power supply is necessary to support tea processing, fruit canning, and rice marketing.

In addition, a steady flow of containers must be assured under the tea and fruit canning projects. Raw product collection and hauling must be provided under the marketing projects associated with cacao, tea, fruit canning, bananas, input supply, and rice milling.

Finally, it is strongly recommended that the Campesino users of these projects be directly involved from the planning stage onwards. Users should actually outline how the projects are to be organized, administered, and run, including technical aspects, and users should define project content.

This report addresses market potential and associated topics. The feasibility of outlined agroindustrial and agricultural marketing activities has not been analyzed, nor is it implied that any project discussed is feasible. Furthermore, recurrent costs will be significant at least in cacao, tea, canning, and input supply. These costs will begin to reach full levels only in 1985 and beyond. Time and scope have not permitted analysis of recurrent costs, but their finance will fundamentally determine project success.

Summary Table - A table summarizing first stage marketing requirements for PID development is shown on the following page.

SUMMARY OF MARKETING REQUIREMENTS FOR PID DEVELOPMENT - FIRST STAGE

- 2e -

ACTIVITY	Immediate Project	Market Study Part of PP	No Marketing Actmty next five years	Estimated LOP <sup>1/</sup>		Study Man Months (No.)	Coverage in		Required Supporting Services			OBSERVATIONS
				I. Cost (\$1000)	Purchasing Capital (\$1000)		Hectares (No.)	Farms (No.)	Roads	Power	Other	
A. CACAO	X			496	1,280	0	2,000	2,000	X	X	TA Sales	Production development must come first. This will require at least 3 years.
B. TEA	X			500	150	0	140	280	X	X	TA Sales	Institutional problems associated with the expansion of the Chinese Mission project can be expected.
C. RUBBER			X	-	-	-	-	-	-	-	-	A production project is probably justified.
D. BLACK PEPPER	X			10	80	0	36	144	-	-	TA Sales	A complete production project was prepared by Karl Hoffman et.al.PRODES, February, 1980.
E. FRUIT CANNING PLANT	X			400	500	0	28	56	X	X	Productn. TA, *Con-tainers, Sugar	Pineapple hectarage expansion must start June,1982. A 450 mt/mo. plant can be installed 1982-83.
F. ORANGES			X	-	-	-	-	-	-	-	-	A production project is justified.
G. BANANAS		X		na	na	3	na	na	X	-	TA Sales	A project is probably possible by December,1982.
H. NUTS			X	-	-	-	-	-	-	-	-	Virtually no information was available.
I. RICE		X		325	232	3	1,000	ne	X	X	TA F. Train-ing	Study May-Sept., 1982. Project possible Dec., 1982, or in 1983.
J. BANANA, YUCCA DEHIDRATING		X		1,150	na	3	na	na	na	X	TA Sales Others	Feasibility study to determine levels of other factors.
K. INPUT SUPPLY		X		na	na	1	na	ne	-	-	TA F.Train-ing	Study May-Sept., 1982 project possible Dec.,1982, or in 1983.

LOP = Life of Project

Na = Not available

Ne = No estimate

<sup>1/</sup> Annual operating costs, other than raw material purchasing costs, are included in these estimates only for the canning plant. Normally, the excluded annual operating costs will be large and recurrent. LOP costs shown represent first stage development. LOP estimates for expanded first stage activity are not shown on this table.

## II. MARKETING AND PID DEVELOPMENT

### A. CACAO

#### 1. Summary of Marketing Considerations

- a. Project Title  
Cacao Collection, Processing, and Sales
- b. Crops Involved  
Cacao
- c. Products To Be Produced  
Dried, fermented cacao beans of large size and uniform high quality, to be packed and shipped to national chocolate manufacturers.
- d. Production Targets  
First stage production targets recommended are: 750 metric tons (mt) of dry beans per year, to be produced on 2000 hectares, involving 2000 farms. Seven to eight fermenting and drying plants will be required, to be phased in as production develops. During or after the first stage, there will be opportunity to increase total production to 1600 to 3100 mt, on 4250 to 8250 total hectares.
- e. Prices (dry beans)
  - (i) Bolivian Manufacturers, to producers, variable quality, in La Paz, \$b3800 - \$b4200 per qq, or \$US0.87-0.97 per pound. This is a post-devaluation, March 1981 price, and still very tentative.
  - (ii) New York spot, Friday, March 12: \$US0.89 per lb.
  - (iii) Annual average NY futures, first nine months 1981: \$US0.891 per lb.
  - (iv) There were no green bean quotes available, as there is no green bean market in Bolivia. At current dry bean prices, green beans would be priced below \$US0.12 per pound.
- f. Production Zones  
According to Baucom et. al., cacao is suited to areas having annual average temperatures between 21 and 30 degrees and annual average rainfall between 1200 and 4000 mm. The best cacao is grown at annual average temperatures of 24-25° and rainfall between 2000-3000 mm (Page 30). The same report recommends Chapare soils associations R1, R12, R13, R12/13, C, and T2 (page 31). According to PRODES, first stage production would be located in Puerto Alegre, Valle Ivirza, Sajto, San Francisco and Todos Santos. (Volume I, Chapter VIII-1).

g. Product Specifications

Formal dry bean specifications were not available. According to INCADEX, quality is a function of bean size, color, acid content, and, above all, uniform, technically correct processing. These attributes are attainable in the Chapare by using hybrid varieties (available in Alto Beni nurseries), and by the central, technically correct fermenting and frying of green beans.

h. Buyers

Dry beans are to be sold to the 25 odd existing Bolivian chocolate manufacturers. In particular, INCADEX has just completed the installation of chocolate tablet machinery which will generate an incremental dry bean demand of 500-700 mt per year by 1985.

i. Implementing Agency

No implementing agency was identified. INCADEX or other manufacturers may be willing to financially participate in processing, to assure quality control.

j. Required Supporting Services for Marketing

To support cacao collection, processing, and sales, rural access roads and purchasing capital are required.

k. Timing

Plantation of 2000 hectares of cacao and construction of seven to eight fermenting and drying plants (phased according to the production schedule) can begin immediately.

2. Discussion

a. Production, Exports, Imports, Consumption, and Prices

Between 1976/77 and 1981/82, MACA officially estimated dry bean production at 2800 to 3200 mt annually. That estimate has been flat at 3000 mt for the last three years. (FAS, page 2). Interpolating in 1979 from field inspection of coca hectareage, probable true yields, and installed national processing capacity, Baucom et al. estimated true production at 1500 mt annually (page 24). The latter is taken here as the correct figure.

Bolivia's cacao bean exports are estimated at 750 mt annually. INCADEX currently exports beans, and believes exports can be tripled in the near future, given a steady supply of uniformly high quality beans. Argentina is a large cacao importer, supplied chiefly from Brazil. Bolivia has a comparative advantage in northern Argentina, as well as growing trade with other Latin countries under several regional trade agreements.

The manager of INCADEX showed consultants several Argentine bean orders he was unable to fill due to lack of supply.

Bolivia currently imports about 500 mt of dry bean equivalents. About 250 mt of this is processed sugared cacao powder (coca powder). The rest is chocolate confections, chiefly contraband chocolate candy. Officially, imports are estimated 225-250 mt per year, 90% of which is sugared coca powder.

The new chocolate tablet machinery represents an incremental bean demand of 500-700 mt per year because it enables the production of cookie coatings, ice cream toppings, candy bars, and like products not now produced in Bolivia. The minimum bean demand represented by this machinery, and by the stated plans of INCADEX's general manager, is 200-250 tons of import replacements plus 450-500 tons of new cocoa butter. With minimal demand growth, either internally or for export, 700 more new tons will be required.

Total annual dry bean consumption by 1986, the first date when new Chapare plantations could come into production, is therefore estimated as follows:

1979 consumption of national dry beans :	750 mt
exports :	750-1500 mt
imports :	500 mt
demand growth 1979-1986 :	395 mt
incremental butter demand :	<u>-500-700 mt</u>
minimum range of expected	
1986 consumption :	2895-3845 mt
national production :	<u>-1500 mt</u>
incremental 1986 dry bean disappearance:	1395-2345 mt

The current Alto Beni production situation is not known. Production was reported to be expanding there in the late 1970's, but is now reported to be flat, due to falling international prices, lack of technical assistance in production, lack of credit and crop finance and disease problems. For prudence, one-half (700-750 mt) of the minimum estimated 1986 incremental dry bean disappearance is reserved for the Alto Beni.

In March 1982, La Paz dry bean processors were paying a post devaluation price of \$b3800-4200 per qq, or \$US0.87-0.97 per pound. New York spot cocoa prices were varying between \$US0.85-0.90 per pound. Between 1966 and 1972, annual average New York cocoa prices varied between \$US-.23 and 0.39 per pound. They then rose steadily until a 1977 peak of \$US1.72 per pound was reached. World cacao prices have declined steadily since 1977, and have exceeded \$US1.35 per pound in

just 22 of the 51 months between January, 1978 and the present. Average monthly New York prices have not exceeded \$US1.00 per pound since October of 1980. Bolivia's cacao prices have historically paralleled world prices, just as at present. No green cacao prices were available, as there is no Bolivian market for green, wet, unprocessed beans. At a conversion factor of 6:1, and presuming that 3/4 of processing costs are raw product costs, while 1/4 of processing costs are other costs, 1/ green bean prices at present cannot exceed \$US0.12 per pound.

#### Summary

At this writing, the following incremental dry cocoa bean production would clear the Bolivian market at present prices: 500 mt of imports and 500-700 mt of butter-based products. By 1986, the first date when new Chapare plantations could come into production, minimal demand growth will add an additional 395-1145 mt to dry bean demand. Therefore, the minimum incremental dry cacao bean demand by 1986 is estimated at 1395-2345 mt. Minimal export growth would push the figure to 2350 mt, or more. Discounting a maximum possible production development in the Alto Beni of 750-800 mt (which however, might actually be zero), the immediate plantation of 2000 to 4250 hectares of Chapare cacao, on as many farms, is indicated. Bolivia's dry bean prices have historically paralleled world prices. Currently, prices stand at \$US0.87 to \$US0.97 per pound, and have been near these levels since August of 1980. Assuming a first-stage development of 750-800 hectares, production development will be associated with the installation of seven to eight fermenting and drying plants. An implementing agency was not identified.

- b. Principal Marketing Constraints and Associated Project Activities  
The Process - The process to be employed in the seven to eight fermenting and drying plants is described by Baucom et.al. on pages 55-61, and again by PRODES in Propuesta de Estrategia, Volume II, Chapter VII-23, Section 3.2. Briefly, this consists of harvesting, collecting, receiving, fermenting, drying, storing, and packing for final shipment. A sales and warehousing activity in Cochabamba is desirable.

The Plants - First stage development of 700-800 mt of cacao will require seven to eight fermenting and drying plants, each of 600 mt wet, or 100 mt dry capacity. These will work 8 months per year. Because the cacao will be produced on hundreds of small

farms, it is better to decentralize the gathering and fermenting activity, as fermentation must begin within 24 hours of harvest.

The total investment cost at each fermenting center is estimated at \$US62,000: \$25,000 for the structure and associated equipment (fermentation boxes, drying trays, bags, scales, hand tools, etc.); \$25,000 for the collection vehicle (a jeep pickup); and \$7,000 for studies and other. In addition, each center will require \$10,000 for non-raw material operating expenses (equivalent to 2 months operating costs), and \$160,000 for the annual purchase of 600 mt of green beans (at \$US0.12 per lb.). Total operating capital required per center: \$US170,000 (Baucom, et.al. pp 67-70; PRODES, Propuesta, Vol. II, Ch. VIII-23, Sec. 4.1 and 4.2).

Activities included that are indispensable to final product sales are:

- . Technically correct harvesting, immediate depulping, and collection of green beans within 12 hours of harvest.
- . Provision of \$170,000 of operating capital per center.
- . Technically correct fermenting and drying
- . Technical assistance in harvesting, gathering, and processing. A qualified cacao processing engineer should be physically present in the plant whenever cacao fermenting and drying is taking place.

Warehousing, Sales, and Market Development - Baucom et.al. recommended that the assembly, warehousing, and central sales of dry bagged beans take place in leased Cochabamba facilities. Market development can also take place there. Operating costs associated with these activities will reach \$US16,000 per year by 1986.

Required Supporting Services - Rural roads to access producers and to link the fermenting and drying centers with main roads are necessary.

Requirements for Further Market Research - No additional market research is required for the size of the proposed project: the plantation of 2000 ha. of cacao, to yield 700-800 mt. of dry fermented beans annually.

### 3. Documents and Persons Consulted

PRODES: Propuesta de Estrategia y Acciones para el Desarrollo del Chapare. Vol. II, Ch. VIII-23, "Planta Beneficiadora de Cacao).

MASI: Regional Development of the Tropical Chapare of Bolivia. Volume II, Ch. V.B.4, pages 241-247.

Mr. Ramiro Jauregui, Gerente INCADEX, Tel. 364269

PRODES and U.S. State Department. Cacao, Spices, and Dehydrated Vegetable Study for the Chapare Region of Bolivia. La Paz, Bolivia, October, 1979.

FAO: Committee on Commodity Problems, "Main Issues in the World Commodity Situation and Outlook." FAO Publication # CCP 81/8, July, 1981, pages 4-5.

USDA-FAS: Cocoa, Foreign Agriculture Circular FCB 3-81, October, 1981.

\* \* \* \* \*

## B. TEA

### 1. Summary of Marketing Considerations

- a. Project Title:  
Tea Collection, Processing, and Sales
- b. Crops involved  
Tea
- c. Products To Be Produced  
Black tea graded for size and packed in 25 kilo wooden chests, with a poly-liner. During later project years, consumer-sized packages may be added. These might include 1/2 and 1/4 pound, and 2 gram bags.
- d. Production Targets  
First stage production targets recommended are: 95 to 155 metric tons (mt) of black tea per year, to be produced on 90 to 140 hectares, involving 180 to 280 farms. One to two 120 mt capacity dry tea processing plants will be required.

If, with successful operation, the project develops according to the more optimistic forecasts of MASI, PRODES, and HANSA, these targets can be tripled or quadrupled, to as much as 600 mt of new dry black tea production by 1990.

e. Prices

- (i) CBF, to producers, for green leaf: \$b10 per kg.
- (ii) CBF, in La Paz, for black tea, in 25 kg.chests: \$200 per kg.
- (iii) Current imports, black tea, 35-50 kg. chests: \$US3.00 per Lb.
- (iv) Average 1978-81 London auction: US\$0.98 to \$1.01 per Lb.

f. Production Zones

According to MASI (page 199), tea is suited to Chapare production zones 2, 3, 4, 7, and 8. According to PRODES, immediate areas would be Villa Tunari, Chimoré, Paracti, and Crystal Mayu. In general, the world's better quality teas are produced above 1500 meters elevation.

g. Product Specifications

Specifications for Chimate tea, which is of good quality by world standards, were supplied by CBF, as follows:

	<u>Valor BOP</u>
Materia seca en %	93.67
Cenizas totales en %	5.80
Cenizas insolubles en ácido %	0.80
Cenizas solubles en agua %	66.59
Oleobinidad de ceniza soluble en agua %	0.99
Extracto acuoso en %	35.08
Fibra cruda en %	11.09
Color pardo negrusco	

h. Buyers

Tea is to be sold to existing Tea importers, packers, and retailers, such as HANSA and Hornimans. In later years the project may pack and sell under its own label.

i. Implementing Agency

CORDECO is willing to implement this project, by expanding its current 40 ha pilot tea area to as much as 200 ha. Either the pilot 50 mt processing plant will be expanded to as much as 220 mt, or two plants of 120 mt each will be built. CORDECO wishes to maintain its current close ties with the Chimore Tiawanese Mission on this project, and may be unwilling to work with PRODES.

j. Required Supporting Services for Marketing

To support tea collection and marketing, rural access roads, rural power supply, tea chests, and purchasing capital are required.

k. Timing

Plantation of 90 to 140 hectares of tea and expansion of the pilot plant according to the tea production expansion schedule to 120 mt can begin immediately.

2. Discussion

a. Production, Consumption, Prices, Exports, and Imports

In 1978, MACA estimated national production of black tea at 291 mt. For 1981, the CBF estimated black tea production at 120 mt, while PRODES estimated 137 mt. The MACA estimate is optimistic, and 80 hectares of tea in the Mapiri area have gone out of production since 1978.

Presently, 22 new hectares of tea, not yet in production, have been planted in the vicinity of Km 52 on the Caranavi-Alto Beni road. Forty more new hectares have been planted in the Chapare. The CBF plans to begin tea production in a new 45 mt per year plant at Km 52 in 1982. This plant will shortly be expanded to 60 mt.

The following 1981 black tea consumption estimates have been obtained for Bolivia: by the CBF, 280 mt; by the Chimoré Mission, 318 mt; by MACA, 500-600 mt; and by MASI-PRODES, 680 mt. The latter is a demand projection, made in 1979, and was based on official MACA data from earlier years.

Comparison of these estimates yields the following table:

<u>Source</u>	<u>Production Minus Consumption</u>	<u>No. of Hectares Implied</u>
CBF	-143 to -160	130 - 145
Chimore Mission	-181 to -198	165 - 180
MACA-PRODES-MASI	-363 to -560	330 - 510

Two retailers reported immediate willingness to buy 120 mt per year more tea than at present.

Post devaluation internal prices have yet to be fixed, but CBF proposes to pay producers \$b10 per Kg. for green leaf, and proposes to charge \$b200 per Kg in La Paz for black tea packed in 25 Kg chests. Current input prices are above \$US3.00 per pound for black, chest-packed tea. The average annual London auction price for all teas has ranged between US\$0.98 and \$1.01 per lb. for the last 4 years. These data indicate that tea is one of the few Bolivian agricultural commodities whose internal price is lower than the corresponding world price.

Bolivia does not presently export tea. One firm visited showed consultants a letter from an English wholesaler offering to buy 50 tons of Bolivian tea at US\$2.70 per Kg. (\$1.22 per lb.) Import statistics are unreliable, due to contraband, but were reported at 260 mt by FAO in 1979. Not less than 15 brands of imported tea are available on the La Paz Black Market. The above table suggests that 143 to 560 mt of black tea were imported in 1981.

### Summary

There is immediate room in the Bolivian market to replace not less than 160 to 200 mt of annual black tea imports. Imports are currently priced well above Bolivian tea. Discounting 45-60 tons that will come from CBF's new Alto Beni plant, a first stage (immediate) Chapare project is indicated. This will probably be an expansion of the CORDECO-Taiwan project. Targets are: 95 to 155 new mt of black tea per year, to be produced on 90 to 140 newly planted hectares, involving 180 to 280 farms. One 120 mt per year processing plant will be associated with the first stage.

For the long term, these targets may be tripled or quadrupled, to as much as 600 mt of new dry black tea production by 1990. Exports are possible in this commodity.

### b. Principal Marketing Constraints and Associated Project Activities

The Process - The process employed in the Chapare pilot plant is briefly described by PRODES in Propuesta de Estrategia y Acciones para el Desarrollo del Chapare, Volume II, Chapter VIII, under the heading "Planta Beneficiadora de Té". Briefly this consists of harvesting, collecting, receiving, drying, rolling, fermenting, re-drying, grading, and packing the tea. The process may be observed in two existing CBF Alto Beni Plants: at Chimate, Mapiri; and at Km 52 on the Caranavi-Alto Beni road.

The Plant - The same PRODES document estimates total costs, including operating costs for a 120 mt annual dry black tea plant at US\$1,047,000. This estimate is for a plant to produce bagged tea. A plant that would produce only tea chests, for sale to retailers, might be built for about \$750,000. The plant should be located within the tea fields. If not, special collection trucks will be needed as a part of the project.

The total estimated cost of the CBF's new 45-60 mt plant at Km 52 is US\$500,000. This includes land, buildings, machinery, equipment, storage, administration facilities, and ancillary works. Total area of constructed buildings is estimated at 1000 m<sup>3</sup>, and total machinery cost at \$166,000.

Activities included that are indispensable to success in final product sales are:

Tea Collection - Tea must be collected at field's edge and transported to the plant within 12 hours, due to the high perishability of the green leaf.

Operating Capital - The purchase of 660 tons of green leaf at \$10 per Kg will require \$150,000. The plant will also require 3 months finance for other operating expenses, estimated by PRODES at \$34,000. Total operating capital required \$184,000.

Containers - 4,800 poly-lined, 25 Kg wooden chests are required to pack 120 mt of black tea. Assuming these can be contracted at US\$10.00 each, \$48,000 will be required for tea chests.

Technical Assistance - A qualified tea process engineer should be physically present in the plant whenever tea is being processed.

Sales and Market Developments - Potential buyers should be invited to inspect the plant while it is being constructed. They should also be frequently invited to inspect tea processing, and asked to suggest how the process can be improved.

HANSA expressed interest in financial participation in the project, particularly in process activities, and particularly in quality control.

Uniform quality, meeting London specifications (not available at this writing), should be the primary processing objective.

Required Supporting Services - Rural roads to link the tea fields with the plant are requisite to project success. The plant will also require electricity for machinery operation, and perhaps for drying.

c. Requirements for Further Market Research

No additional market research is required for the size of project proposed: 120-220 mt of black tea. An aggressive sales manager is required.

3. Documents and Persons Consulted

PRODES      Propuesta de Estrategia y Acciones para el Desarrollo del Chapare. Volume I, Chapter VIII, "Promoción de Cultivo del Té". Volume II, Chapter VIII, "Planta Beneficiadora de Té".

MASI          Regional Development of the Tropical Chapare of Bolivia, Volume I, Chapter V.B.2, pages 194-213.

Mr. Tommy Hegedú J., HANSA, Ltda. Técnico Experto en Té, Tel. 812705

Ing. Julio Peña y Lillo. CBF, Jefe, Proyecto Agroindustrial de Té.  
Tel. 324957

Ing. Armando Torrico A., Jefe, Programa Agroindustrial and  
Ing. Gilberto Hinojosa, Gerente General, CORDECO, Tel. 28250-51  
(Cochabamba).

## C. RUBBER

### 1. Summary of Marketing Considerations

Rubber development in the Chapare will be a production project. No marketing interventions will be required for the life of the project. No additional marketing studies will be needed. If approval for a variety improvement, tree dissemination, and plantation project were obtained today, the first latex output of significance would occur ten years hence.

### 2. Discussion

The Current Chapare Production Situation - In 1978, the Formación de Mano de Obra Calificada (FOMO) conducted a farm by farm census of Chapare rubber trees, actually counting trees. FOMO estimated that there were then twenty to twenty two thousand rubber trees in the Chapare. If planted in a single plantation, these would cover 40 to 45 hectares.

In general, rubber trees do well in the Chapare. First rubber development started in 1964. Experiments at Chipiriri and La Jota have shown that trees there develop at equal rates to those at Brazilian and Malaysian stations, and faster than trees at Riberalta (based on repeated measurements of tree diameters). Latex yields are reported as better than world averages. At least one farmer is regularly exploiting rubber trees at this time, on a 3 hectare plantation. However, the current volume of latex does not justify processing investments in anything greater than a few hand presses.

Production, Consumption, Exports, Imports, and Prices at National Level - Bolivia's total rubber output is estimated by CBF at 3900 mt of bolaches. Of these, 1200 tons are exported to Brazil, while the remaining 2700 mt are processed into laminated blocks at CBF's Riberalta laminating plant. Annual output at Riberalta is estimated at 1700-1750 mt of laminated natural rubber blocks. Of this, about 150-200 mt is used within Bolivia and 1450-1600 mt is exported under subsidy to Brazil. Apparently, there are long term export agreements in place between the CBF and Brazilian buyers.

Several buyers of CBF laminate report that the product is of high quality, competitive by world standards, has high local market acceptance, but is also expensive relative to both synthetic and imported natural rubbers.

Based on interviews with CBF and with three of the four largest Bolivian rubber users, annual Bolivian rubber demand is estimated as follows:

Natural rubber: 150-200 mt (40-50 mt imported)  
Synthetic rubber: 550-800 mt (all imported)  
Total demand: 700-1000 mt

Prices - Use of natural vs. synthetic rubber is highly sensitive to relative prices and there are large substitution possibilities between the two types. However, there will always be a demand for both, due to technical factors in processing. Historically, internal Bolivian natural rubber prices have been higher than world natural rubber prices making export difficult. Current CBF exports to Brazil involve subsidies.

Available pre-devaluation prices were:

	<u>\$b per Kg.</u>
CBF laminated blocks, ex. buyer:	70-105
bolaches, ex. buyer:	45- 73
imported natural rubber:	60
imported synthetic rubber:	26

The post-devaluation situation is not yet known.

Conclusion - If all internal rubber demand were converted to natural types, less than 1/2 of the current Riberalta output would clear the national market. Therefore, any new production will have to be exported. Because the first Chapare latex production is at least 10 years away, marketing interventions under this PID are not required.

Long-Term World Market Outlook - Natural rubber is an industrial raw material. Its demand depends on the vigor and growth of the world economy, particularly that associated with automobiles (tires and spare parts) and heavy industry. When synthetic rubber was discovered, oil was cheap. Synthetic rubber quickly captured most of the world rubber market. With the conversion to radial tires and the spectacular rise of oil prices, the demand for natural rubber again increased. For several years, natural rubber has been capturing market share from synthetic rubber. Today, that market share (about 40-45%) is higher than it has been for many years, and is expected to continue to increase.

The recent stagnation in the world economy has reduced the demand for rubber of all types. Between February 1980 and May 1981 world natural rubber prices fell by 30%. Data on total consumption and stocks were not available at this writing. An international natural rubber agreement was concluded in 1979.

The long-term market outlook for natural rubber must be regarded as favorable. Oil is expected to become increasingly scarce and more highly priced, crop diversification in Malaysia is expected to continue, there is a continuing prospect of political instability in Southeast Asia, and the stagnant world economy must at some time recover. All of these events will stimulate world demand for natural rubber.

Regarding the Chapare, Manaco-Bata advised consultants that it operates a multinational block-purchasing system to supply its shoe factories in 92 countries. Given a Chapare product of uniform high quality and competitive price, Manaco-Bata may be able to place large quantities of natural Bolivian rubber.

3. Documents and Persons Consulted

Ing. Juan Cuellar, rubber technician. PRODES, Villa Tunari

Ing. Mario Flores T., Director Proyecto Goma. CBF, La Paz  
Tel. 34 3028 or 32 4203

Mr. Guido Méndez W., Gerente Rubber Ltda. Cochabamba  
Tel. 6 0196

Mr. Adam Kripple, Gerente de Compras. MANACO, Cochabamba

Mr. Abel Pacheco, Gerente. GOMATEX, La Paz

FAO. Commodity Review and Outlook 1980-81  
Rome, 1981, Page 111

Committee on Commodity Problems, "Main Issues in the World Commodity Situation and Outlook". Document CCP-81/8, July, 1981, Page 11.

MASI Regional Development of the Tropical Chapare of Bolivia.  
Volume I, Pages 222-229.

\* \* \* \* \*

D. BLACK PEPPER  
(Piper Nigrum)

1. Summary of Marketing Considerations

a. Project Title  
Black Pepper Processing and Sales

b. Crops Involved  
Black Pepper (Piper Nigrum)

c. Products To Be Produced  
Black peppercorns, packed in 100qq bags

- d. Production Targets  
Life of project targets recommended are: 72 mt of dry black peppercorns per year, to be produced on 36 hectares, involving 144 farmers. One rudimentary processing center will be required.
- e. Prices  
Baucom et. al., Cochabamba retail, 1979: \$US2.00/lb  
Hoffman et. al., to producer, February, 1980: \$US0.91/lb  
Hierbas y Cía., to producer, March, 1982: \$US0.56-0.63/lb <sup>1/</sup>  
Approximate annual average N.Y. wholesale spot prices, \$US per lb.,  
Brazilian black pepper: 1979, 0.919; 1980, 0.833; 1981, 0.672  
(first three months.
- Before interpreting these, please see the discussion on prices in Section 2.a, below.
- f. Production Zones  
It is proposed to follow the project designed by Hoffmann et. al. (1980). There would be four plantings of 1/4 hectare in each of the 9 Chapare agro-ecological zones.
- g. Product Specifications  
Formal specifications were not available at this writing, but may be obtained from the American Spice Trade Association (ASTA), Englewood Cliffs, N.J.
- h. Buyers  
Dry, bagged pepper is to be sold to existing importers: Hierbas in Cochabamba, Hansa and Grace in La Paz and to others (Salvadora, Montero).
- i. Implementing Agency  
An implementing agency was not identified. It is proposed that PRODES, with its agronomy field staff in the Chapare, implement this project as proposed by Hoffmann et. al. Much of the rudimentary processing required by pepper can be done comparatively, by the growers themselves.
- j. Required Supporting Service for Marketing  
None are required.
- k. Timing  
The plantation of 36 hectares of pepper and the construction of the rudimentary processing center can begin immediately.

<sup>1/</sup> No purchases actually took place at this price.

## 2. Discussion

### a. Production, Exports, Imports, Consumption, and Prices

National black pepper production is believed to be nil, as are exports. The latest import data available from MACA covered the period 1969-79. Over this period imports ranged between zero and 156 mt annually and averaged 56.7 mt. Two spice importers were interviewed. One did not import any pepper in 1981, the second had not imported any pepper since 1979. These companies did not estimate market size, but felt that 50 mt per year would easily clear the market. Brazilian contraband pepper was reported to enter Bolivia in large quantities relative to market size, and at low prices. This was a major obstacle to market development for legitimate imports.

Apparently, there has been very little recent wholesale Bolivian trade in pepper, other than contraband. Hence, markets are not well established. Baucom et.al. presented evidence (page 76) to suggest that internal prices were much higher than world prices. However, that evidence also permits the conclusion that retailer mark-ups are high. Historically, extreme fluctuations have been the rule in all spice prices, including pepper. World pepper prices have been declining since 1979 or earlier, and currently stand at about 50 US cents per pound.

- ### b. Principal Marketing Constraints and Associated Project Activities.
- Pepper Production - Pepper production is necessary before marketing, as there is now no production. Most prior work recommends variety trials before any significant production is attempted (MASI, Baucom). However, Hoffmann reports that about 3000 pepper plants were brought to the Chipiriri and La Jota stations some 15 years ago, and flourished for a time. These plants have since disappeared due to the lack of care, but yielded 700-1200 grams per plant annually during their lives. The project proposed by Hoffmann et.al. (February 1980) is trial oriented and at once will yield about the amount of pepper that the internal market can absorb. This production project and the elementary marketing activities proposed below should be developed together.

The Process - Pepper processing is rudimentary, and consists of immersion in boiling water for one minute, sun drying to 10-12% moisture content, cleaning, and bagging. A brief description is given in Baucom et.al., page 81.

The Plant - A description of a parboiling and drying facility was not available. Presumably, this would consist of parboiler, which could be wood fired, to hold 100-200 Kg. of peppercorns per batch, and a covered concrete drying platform. The pepper could be cleaned on screens or tables, by hand. Estimated investment cost for facility

to process 72 tons annually: \$10,000. Purchasing capital required: 72 tons times \$US 0.50 per pound, or \$US80,000. Hand labor, bags, and other miscellaneous operating expenses will be incurred, and are not included in these estimates.

Required Supporting Services - Technical assistance will be required during harvesting, parboiling, and cleaning, and especially during production. A sales agent will be required.

3. Documents and Persons Consulted

Baucom et.al. Coca, Spices, and Dehydrated Vegetable Study for the Chapare Region of Bolivia. La Paz, October 1979. Pages 74-82, and 91-98.

Hoffmann et.al. Proyecto Producción de Plantas y Semillas Mejoradas, Sub Proyecto Cultivo de Pimienta Negra (Piper Nigrum). Oficina Regional PRODES-Chapare, Cochabamba, Febrero 1980.

PRODES - Propuesta de Estrategia y Acciones para el Desarrollo del Chapare. Vol. II, Ch. VIII.11

Jorge Bollman, Director de Proyectos de Hansa Ltda. (La Paz,) Tel. 35 5459.

Gregorio Hierbas, Gerente, Hierbas y Cía. (Cochabamba), Tel. 2 2158.

\* \* \* \* \*

E. PINEAPPLE, PALM HEART, AND PASSION FRUIT CANNING

1. Summary of Marketing Considerations

a. Project Title

Pineapple, Palm Heart, and Passion Fruit Canning

b. Crops Involved

Pineapples, palm hearts, and passion fruits.

c. Products to be Produced

Pineapple pulp in 5 Kg. cans

Pineapple slices in 1 Kg. cans

Palm hearts in 1 Kg. cans, starting in 1985

Passion fruit juice in 1 Kg. cans, starting in 1985.

d. Production Targets

First stage annual production targets recommended are: 960 mt of processed pineapple products, or 1600 mt of raw pineapples, to be produced on 28 hectares, involving 56 farmers. One 450 mt per month capacity canning plant will be required, at a total 1982 investment cost of US\$400,000. On this, US200,000 will be a cost to the project and US\$200,000 will be a cost to private industry. The first stage production targets imply an operating capital requirement of US\$500,000.

If, with successful operation, the project develops according to the expectations of PRODES and Del Valle, annual 1985-86 production targets may reach: 9,600 mt of processed pineapple products (16,000 mt of raw pineapples), plus 60 mt of processed palm hearts, plus 300 tons of passion fruit juice (1000 mt of raw passion fruit). These would be produced on a total of 605 hectares: 280 in pineapples, 20 in palm hearts, and 200 in passion fruit. In this case, a total of 1000 farmers would be involved: 560 in pineapples, 40 in palm hearts, and 400 in passion fruit. To support these targets, the 450 mt per month processing plant would be expanded to handle 6,500 mt per month at an additional project cost of US\$220,000. These 1985-86 production targets would require a total of US\$4.3 million in purchasing capital. Total operating capital required for the 6,500 mt plant could not be estimated at this time.

e. Prices (pre-devaluation)

- (i) One palm heart, 1.2 to 1.5 Kg. to grower \$b8
- (ii) Passion fruit, to grower \$b20 per Kg.
- (iii) Fresh pineapple, Chapare, 1981-82, to grower, each \$b2 to \$b15, average \$b8. Attractive price to grower: \$b10 each
- (iv) Buenos Aires wholesale price, box of 24 one Kg. cans of South African pineapple: US\$17.

f. Production Zones

According to PRODES, pineapple is suited to the Mariposas, Melga, Barrientos, and Lauca Eñe areas. In that Del Valle will be involved, the canning plant will probably be in Mariposas.

g. Product Specifications

Formal product specifications were not available. Del Valle is now canning these products, and would presumably keep its present specifications.

h. Buyers

Del Valle will purchase, can, and sell the entire output from this project.

- i. Implementing Agency  
PRODES will organize and direct growers. PRODES will make contractual arrangements between growers and Del Valle. The latter will operate the plant, and sell the products.
- j. Required Supporting Services for Marketing  
The canning plant will require the following supporting services: a production project in each commodity; operating and purchasing capital; large volumes of cans and paperboard boxes; rural power; rural access roads; and large volumes of sugar.
- k. Timing  
Plantation of 14 new hectares of pineapples and installation of the 450 mt per month plant can begin in 1982.

## 2. Discussion

- a. Demand  
Unlike other report commodities, production targets in these fruits are based on market analysis by the Del Valle canning company. Del Valle maintains an export development department, and has visited Argentine wholesaler importers. Del Valle believes it can sell the indicated production volumes in Argentina and Europe. For example, in December, 1981, the Company secured immediate orders for 340 mt per month of canned pineapples from just two Buenos Aires importers. Argentina currently imports pineapples from Mexico, Ecuador, South Africa, Paraguay and Brazil. Import volumes were not available. The company periodically receives passion fruit juice orders from Europe.
- b. Principal Marketing Constraints and Associated Project Activities.  
Production - At this writing, there are approximately 14 hectares of smooth skinned pineapples in commercial production in the Chapare. From these, and from the PRODES Villa Tunari nursery, there are another one-half million or so suckers available for transplanting. Thus, as many as 28 hectares of commercial smooth skinned production could be in place by the end of 1983.

There are no commercial plantations of either palm hearts or passion fruit in the Chapare at this time. However, small plots or isolated plants of pejivalle and passion fruit can be observed in the Chapare. These appear to flourish, though passion fruit production is technically difficult.

It is imperative that production be initiated or expanded, at least in pineapples, before Del Valle moves its canning plant. To begin canning in December 1983, the 14 new pineapple hectares must be planted by June 1982.

The Process - A technical description of the process was not obtained from Del Valle. Presumably, this would consist of technically correct harvesting; hauling; peeling, slicing, or squeezing; mixing; canning; storing; and selling.

The Plant - Del Valle proposes to move to Mariposas a canning line currently installed in its Cochabamba factory. The value of this line is US\$200,000. A new peeler, motors, generators, and other machinery and equipment would be added to this line, and a 720 m<sup>3</sup> building and storage would be constructed. These additions would cost the project US\$200,000. A canning factory of 450 mt per month in one 8 hour shift, would result. By the end of 1983 (assuming 14 new pineapple hectares are planted by June 1982), the factory would have capacity to can the produce from 28 hectares of pineapples: 1600 tons of raw pineapples, or 960 mt of processed pineapple, to be grown by 56 farmers. This size operation would require US\$225,000 for the purchase of 1.064 million pineapples at \$b8 each. Additionally, US\$275,000 will be required for sugar, cans, paperboard boxes, labor, and other operating expenses incurred during the 2-1/2 month, December to February, operating season.

If export markets develop as expected, Del Valle believes the plant can be expanded to 6,500 mt per month capacity, and used to process palm hearts, passion fruit, and greatly increased volumes of pineapple. Expansion to 6,500 mt per month would require an additional investment of US\$220,000: A new pineapple peeler and capper (\$150,000); a new palm heart peeler and capper (\$30,000); a new passion fruit cooker, deseeder, and squeezer (20,000); miscellaneous tables and other equipment (\$10,000); and expansion of the store (\$10,000).

Using Del Valle's indications of current market potential, which are impressions and not careful estimates, the expanded plant would handle about ten times the 1983 pineapple volume, and also process the output from 20 hectares of pejivalle palms and 200 hectares of passion fruit. Given the initiation of the requisite raw product production activities by the end of 1983, annual processing volumes, starting in December 1985, would reach 16,000 mt of raw pineapples (9,600 mt of processed pineapples); 60 mt of processed palm hearts; and 1000 mt of raw passion fruit (300 mt of processed passion fruit juice). At prices of \$b8 per pineapple, \$b8 per palm heart, and \$b20 per Kg of passion fruit, the 6,500 mt plant would require US\$4.3 million for annual raw product purchases. Detail to estimate the other operating costs associated with the larger plant was not available. Clearly, these other costs would total several million dollars.

Processing seasons in these three commodities are compatible: pineapples are processed December to February, passion fruit December to July, and palm hearts all year.

The 450 mt plant could be used to process smaller quantities of palm hearts and passion fruit, during pineapple off-season. Potential volumes were not estimated.

Sales - Del Valle will sell

Required Supporting Services - Production projects in each fruit, the participation of Del Valle, and the requirement for operating capital have been repeatedly mentioned. The first stage project (450 mt per month) will require ten million one Kg. cans with closures, and 425,000 paperboard boxes. Tinplate, closures, and boxes are all imports. Rural power supply to run the factory, and rural roads to access production areas will be required. Large volumes of sugar will be used in processing.

c. Requirements for Further Market Research

No additional market research is required for the 450 mt plant. Before embarking on an expansion to 6,500 mt per month, with the associated production expansion, a careful appraisal of market size should be made. At a minimum, this would involve visits to Argentine importers and correspondence with European importers. The appraisal should specify product volumes, prices, quality and sanitary standards, labels, containers, additives, purchasing seasons, and so on. The appraisal's objective is to assure beforehand that the proposed volume, packs, quality, and other specifications from the larger plant will be sold.

3. Documents and persons Consulted

PRODES      Propuesta de Estrategia y Acciones para el Desarrollo del Chapare. Vol I, Ch. VIII. 6, "Promoción de Piña". Vol.II Ch. VIII. 26, "Procesadora Múltiple de Productos Tropicales."

Hanrahan, et.al. Fruit and Coffee Development Projects in the Yungas and Chapare Zones of Bolivia. Chapter V - Development of Pineapple Production and Marketing in the Mariposa Zone of the Chapare. La Paz, July, 1980.

Marcelo Vásquez, Gerente and Roberto Vásquez. Industrias Alimenticias del Valle. Cochabamba, Tel. 4 1042

Ing. Roberto Peña R., Director-Gerente General, Fábrica Nacional de Conservas Dillman. Cochabamba, Tel. 2 4028

\* \* \* \* \*

## F. ORANGES

### 1. Summary of Marketing Considerations

Orange development in the Chapare will be a research and production project, designed to replace existing with improved trees. No marketing interventions will be required for the life of the project. No project-financed marketing studies are recommended. Supply and demand for Chapare oranges are estimated to be in balance. Even if research, production of improved varieties, and their dissemination proceed vigorously, it will be seven years before significant production impacts occur.

### 2. Discussion

Hanrahan and Hoffmann (1979, pp III-64-65) and Duplache (1982) concluded that the production and consumption of Bolivian oranges are in approximate balance. Given the present production volume, the present quality, and the present production seasons, the fresh internal market is saturated. Internal opportunities exist in the fresh market, but these are related to improving the quality of the oranges themselves, extending production seasons, and developing latent urban quality markets. In 1979, it was estimated that a fresh export market of approximately 1000 tons per year exists in Chile, north of Caldera. However, the Yungas and not the Chapare is favorably positioned to exploit that market. Yungas fruit is higher in quality, and the Yungas is more favorably situated geographically.

The processing situation is equally negative. Volume flows of uniform quality fruit with good processing characteristics are absent in the Chapare. Currently, the Bolivian processed fruit market is in severe contraction. One processor estimated current sales as 35% normal. A series of other problems impedes processor growth. These relate to the availability and cost of containers and operating capital; the national sugar policy; political instability; lack of GOB support for the industry; contraband; and other factors (Hanrahan and Hoffmann, pages III-23 to 35). In addition, the characteristics of currently produced Chapare orange varieties have made them the least preferred of all Bolivian processing oranges.

Bolivia is not favorably positioned to export frozen concentrate orange juice (FCOJ). In addition to all of the factors already cited, the world FCOJ market outlook is dim for both the intermediate and longer terms. Increasing production, vigorous market penetration by new producers, increasing stocks, and Brazilian dominance are fundamental characteristics of the world FCOJ market. Brazil is the world's largest producer and exporter of FCOJ, and currently holds three-fourths of the world's export market. Brazilian production

is steadily expanding. Short term aberrations, such as those induced by this winter's freeze in Florida, should not be confused with long term fundamental market trends.

Chapare interviews disclosed that experimental plantations of the Pera Bahiana and Washington Navel varieties have begun to yield superior quality fruit at Chipiriri and La Jota. PRODES has several thousand rootstocks ready for grafting to these varieties at its central nursery in Villa Tunari.

Conclusion - Orange development in the Chapare will be a production and not a marketing project. The project will be designed to produce quality varieties grafted to disease resistant rootstock, and to disseminate these to farmers. The objective is the replacement of existing trees, not hectare expansion. Market size will be a barrier to any significant production expansion over the life of the project. The low volume of quality fruit, its non-uniformity, the severely contracted internal market, the absence of export possibilities for Chapare oranges, and many other factors impede export market development.

Even in the absence of these factors, it will be seven years before any significant volume of improved varieties can reach the market.

### 3. Documents and Persons Contacted

Francisco Duplache. Director del Estudio de Factibilidad para el Proyecto de Desarrollo Integrado del Chimore. PRODES Office, Cochabamba, Tel. 4 5980.

Roberto Peña. Director-Gerente General, Fábrica Nacional de Conservas Dillman. Cochabamba, Tel. 2 4028.

FAO Committee on Commodity Problems, "Main Issues in the World Commodity Situation and Outlook". FAO Document # CCP 81/8, Rome, September 14-18, 1981.

USDA-FAS Brazil's Orange Juice Industry. Publication FAS-M-295, Washington, April, 1980.

USDA-ERS. Fruit - Outlook and Situation. Publication TFS-221, Washington, November, 1981

Hanrahan, Michael S. and Hoffmann, Robert M. Market Potential for Bolivian Citrus and Tropical Fruits. La Paz, December 1979 (USAID/B Library No. R-M-005).

\* \* \* \* \*

## G. BANANAS

### 1. Background

A number of past writers have estimated that Bolivia's internal fresh banana market is in approximate supply-demand balance (Hanrahan and Hoffman, 1979; IICA, 1981, Cuadro N°70; Duplace, 1982). At the same time fresh banana export markets appear to exist in Northern Argentina and Chile. Over the 1977-1980 period, yearly Argentine and Chilean fresh banana imports grew from 104,000 to 178,000 mt and from 29,000 to 123,000 mt respectively, and in both cases increased each year over the period. There have been a variety of past attempts to exploit these markets. Some years ago a State corporation, CONCOFRUIT, was formed. CONCOFRUIT was to export fresh Bolivian oranges and bananas to Chile and Argentina, but was ineffective. In 1978, René Benavides and partners made a trial 60 ton shipment of Chapare bananas to Chile. This shipment rotted at the border, due to an unrelated political incident between Bolivia and Chile. Benavides then elected to suspend export attempts, but he still feels that export possibilities exist in Northern Chile. Between 1977 and 1979, three separate groups of Argentine shippers actually exported varying amounts of Chapare bananas to Salta, Jujuy, Tucuman, and other Northern Argentine markets. Approximately fifty truckloads of bananas per year were shipped (Hanrahan and Hoffmann, pages IV-24 to 26). For unknown reasons these shipments have since ceased.

Most Chapare bananas are of the dwarf caverdish type. As such, bananas are the only fruit which, at this time, present a uniform, volume flow of quality raw product throughout the year. The acceptance of this banana is good in world, Argentine, and Chilean markets. Bananas are thus the only Chapare agricultural commodity which do not require a production project prior to a marketing effort.

Given these considerations, a fresh banana export project is indicated. However, market data -as well as a limited amount of production data- is not presently available in the quality and detail requisite to support a project design. Therefore, a marketing, project design, and feasibility report is required.

### 2. The Report

The objective of the report will be to analyze the economic feasibility of exporting fresh Chapare bananas to Argentina and Chile. The feasibility report will include, as its most heavily emphasized element, a detailed analysis of the fresh banana market in those two countries. Economic analysis will constitute more than 90% of the effort.

a. Scope of Work

(i) Production Analysis

- (1) Estimate the total annual production volume (tonnage) of Chapare bananas and the percentage of that tonnage constituted by the Dwarf Cavendish (or other suitable) variety.
- (2) Estimate tonnages harvested per month.
- (3) Recommend any improvement in production practices needed to make fresh Chapare bananas acceptable in Argentine or Chilean markets.

(ii) Market Analysis

- (4) Prepare a roster of Argentine and Chilean fruit shippers who are interested in importing Chapare bananas, to include the following items:
  - . Name, address, telephone, telex of the company
  - . Volume of bananas handled in the last three years.
  - . Volume of Chapare fruit they are willing to move.
  - . Varieties preferred.
  - . Delivery or shipping points (where will the fruit be sold).
  - . Preferred norms and standards, including cosmetic standards.
  - . A discussion of any seasonal demand patterns that may affect an export project.
  - . Preferences in containers, package styles, and labels.
  - . Payment practices.
- (5) Determine raw and finished product prices and pricing points.
- (6) Analyze any seasonal demand factors, and estimate total banana volumes that can be shipped by month.
- (7) Recommend and specify a shipping method (truck vs. rail), after considering the following items:
  - . Past experience with Chapare bananas.
  - . Cost.
  - . Reliability.
  - . Requirement or lack thereof for transshipment.
- (8) Recommend the best containers, package styles, and labels, giving reasons.

- (9) Report on phytosanitary standards and requirements in the two countries, and recommend appropriate standards for Chapare bananas. Attention shall be paid to any past incidents where Bolivian fruit has been detained at either border.
  - (10) Provide a detailed description, showing sample forms, of permits, licenses, certificates, etc. required to export bananas from Bolivia and to import them to Argentina and Chile. List agencies and institutions, giving names, addresses, and telephone numbers, which must be involved. Estimate the amount of time and describe the effort required to secure the several approvals.
  - (11) On the basis of this prior marketing work, recommend a project size: the number of farmers and hectares to be involved and the number of tons to be shipped monthly.
- (iii) Institutional Analysis
- (12) Report briefly on past efforts to export Chapare bananas, focusing especially on factors contributing to success or failure.
  - (13) Recommend an institutional organization for the project, including:
    - An implementing institution.
    - The relationship between the exporting entity and the campesino growers.
    - The organization and administration of harvest scheduling, fruit collection, shipment and payments.
- (iv) Feasibility Analysis
- (14) Estimate the financial attractiveness of banana production to the campesino producers.
  - (15) Estimate the first, or investment, costs that would be required to export Chapare bananas, including: any civil works; any storages, including cold storages; and any equipment required to export.
  - (16) Estimate the annual and recurrent costs to be incurred to operate the export scheme, including: power, labor, management, interest, containers, transport, handling, and any other annual or recurrent costs.

- (17) State the number, qualifications, and compensation for the associated labor and managerial force.
- (18) Estimate the tonnage of bananas to be moved, the marketing margins and the associated project revenues.
- (19) Evaluate the financial feasibility of the export marketing effort by preparing a five year financial pro-forma showing.
  - . Investment, or first, and subsequent replacement costs.
  - . Annual cash operating and recurrent costs.
  - . Revenues and net returns.
- (20) Subject the financial pro-forma to a financial sensitivity analysis by using five different price spreads (between producer prices and Argentine or Chilean prices) and estimate the break even sales volume associated with each price spread.

The institutional and feasibility analyses will require extensive and continuous consultation with Chapare campesinos, probably through area sindicatos. The institutional organization of the project should follow campesino recommendations on such points as staffing, pricing, production, scheduling, delivery points, size and duties of the labor force, mark-ups and marketing margins, and so on.

An academically qualified and professionally experienced Bolivian marketing specialist will be contracted to execute this scope of work. Academically qualified means the marketing specialist will possess a Licenciado, Masters, or Ph.D. degree in economics, agricultural economics, or business administration. He should have five years professional experience, including the preparation of feasibility and market potential reports covering the import or export of fresh, perishable agricultural produce.

A written final report, covering all scope of work points, will be presented at the conclusion of the specialist's work. It is estimated that report preparation will require three months: one month of research in Bolivia, three weeks of research in Argentina, two weeks of research in Chile, and three weeks writing time.

3. Report Cost

Cost is estimated as follows:

	<u>\$US</u>
(a) Salary: 3 mos x \$2,500/mo	7,500
(b) Per diem: 60 days x \$45	2,700
(c) Travel and Transportation	750
(d) ODC's	<u>1,000</u>
Total estimated report cost:	\$US11,950

Since the outline of the marketing activity is not known, it is not presently possible to estimate its investment or operating costs.

4. Documents and Persons Consulted

- Hanrahan, Michael S. and Hoffmann, Robert M. Market Potential for Bolivian Citrus and Tropical Fruits (Chapter II and V). La Paz, December, 1979 (USAID/B Library No. R-M-005).
- Hanrahan, et.al. Fruit and Coffee Development in the Chapare and Yungas Zones of Bolivia (Chapter V). La Paz, July, 1980 (USAID/B Library No. R-F-009).
- IICA Diagnóstico Comercialización Nivel Nacional (Cuadro No. 70). La Paz, Enero, 1982
- Francisco Duplache. Proyecto de Desarrollo Integrado del Chimoré, PRODES, Cochabamba, 1982. Tel. 4 5980.
- FAO Trade Yearbook (Vols. 33 and 34). Rome, 1979 and 1980.
- René Benavides L. Cochabamba, Tel. 4 8885

\* \* \* \* \*

H. BRAZIL AND MACADAMIA NUTS

1. Summary of Marketing Considerations

No nut marketing interventions will be required for the life of the Chapare IRDP. It is believed that there are now no macadamia trees in the Chapare. The number of Brazil nut trees is not known. There are no Brazil nut plantations, but there may be a small number of wild trees. Macadamia trees require 2-3 years in nursery, including grafting. Commercial production begins 3-5 years after transplanting from the nursery. According to Hoffmann, Guevara, and Cuellar, Brazil nut trees planted at Chipiriri and La Jota began dropping nuts some 10 years after planting. In either case, commercial production in the Chapare is at least 8 years away. No further marketing studies are recommended.

## 2. Market Background

Virtually no information on the Bolivian production of either nut was available. The internal market for both is apparently nil. MASI concluded that there was no Macadamia potential in the Chapare, or in Bolivia (p.144). The CBF recommended that nut production should not be tried in the Chapare (Ing. Mario Flores interview, CBF, 12 March, 1982). However, Hoffmann reported that a cultivar of five Macadamia trees at La Jota developed vigorously, and began producing nuts after just five years. These trees were then mistakenly chopped down by unsupervised workmen.

Macadamia - World production is rapidly expanding, generally under the aegis of effective government stimulation in several countries. Beside the U.S., the world's largest producer, production is expanding rapidly in Guatemala, Costa Rica, Mexico, South Africa, and Australia. Virtually all production in these countries is for export to the U.S.A. Demand is also growing rapidly, so that prices have remained steady. The U.S. is the world's only major importer, although imports by other developed countries are expected to grow as U.S. usage grows. In 1981, the FAS-USDA stated that the world market remained "relatively untapped" (FAS, FN 5-81, p. 11).

Brazil Nuts - Brazil's 1981 Brazil nut output was the lowest in 14 years, arresting a price decline that began in 1980. World trade was also down in 1981. Major importing countries are US, UK, and West Germany. Walnuts are a close substitute for Brazil nuts in these countries.

Average annual New York spot prices for medium unpolished Brazil nuts, in dollars per kilogram were: 1977, \$1.63; 1978, \$1.93; 1979, \$1.96; 1980, \$1.73. The four year average was \$1.81.

## 3. Documents and Persons Consulted

USDA-FAS NUTS. Foreign Agriculture Circulars FN-1-81 (April, 1981), FN 2-81 (June, 1981), and FN 5-81 (December, 1981).

Duplache, Francisco and Landes, Hugh C. Proyecto de Desarrollo Integrado del Chimoré. PRODES, Cochabamba, March, 1982. Tel 4 5980

Campbell, C.W. and Malo, S.E. La Macadamia. Serie de Traducciones Técnicas #10, UFLA/IBTA/PRODES. La Paz, December, 1977 (PRODES, Cochabamba, Library Document No. 27-1237-C00).

MASI Regional Development of the Tropical Chapare of Bolivia. Vol I Ch. III. C, page 144.

Ing. Mario Flores, Director del Proyecto de Castañas CBF, La Paz, Tel 32 4957

Hoffmann, Karl; Guevara, Javier; Cuellar, Juan (equipo técnico residente en el Chapare). PRODES, Cochabamba, Tel 4 5980

I. R I C E

1. Summary of Marketing Considerations

a. Project Title

Farmers Rice Cooperative

b. Crops Involved

Rice

c. Products to be Produced

Dried, un-hulled rice. Milled rice in bags. Input supply and production improvement can be part of the project.

d. Production Targets

A first stage milling target of 1000 mt of paddy is recommended. If the ENA Chapare mill at Villa Tunari is acquired, only storage space will have to be constructed to reach this target.

If farmers respond and the 1000 mt milling target is attained, the mill can be expanded. New mills and associated works can be brought, an input supply scheme can be added, and production improvement can be made a part of the project.

e. Prices

On March 27, 1982, rice prices were changed. Prior to that time, ENA's official producer paddy prices by grade were:

	<u>\$b per</u> <u>Fanega</u>	<u>\$b per</u> <u>Mt.</u>	<u>US\$ per</u> <u>Mt.</u>
Superior	1,968	11,300	256
Buena	1,778	10,210	232
Popular	1,746	10,020	228

ENA's per mt wholesale selling prices <sup>1/</sup> for milled rice in Cochabamba are: Superior, US\$678; Buena, US\$621; Popular, US\$596.

f. Production Zones

Rice is produced throughout the Chapare. If the ENA mill is acquired for the project, the first stage project area would be Villa Tunari vicinity.

g. Product Specifications

ENA paddy specifications are:

<sup>1/</sup> As of March 27, 1982.

<u>Clases</u>	<u>Humedad</u> %	<u>Manchado</u> %	<u>Quebrado</u> %	<u>Yesoso</u> %	<u>Impureza</u> %	<u>Otras va-</u> <u>riedades</u> %
Extra Superior	14	1	5	5	1.5	8
Superior	14	2	8	4	1.5	9
Buena	14	3.5	18	6	1.5	12
Popular	14	6.5	25	10	2	20
2a. Popular	14	8.5	35	15	2	20

h. Buyers

Rice may have to be sold to ENA by law. Otherwise, it will be sold to rice wholesalers in Cochabamba and Santa Cruz.

i. Implementing Agency

No implementing agency was identified. The project would be a logical expansion of CORDECO's Chapare rice variety trial research project. Since a co-op is proposed, FENACRE might implement the project.

j. Required Supporting Services for Marketing

To support the first phase, rural access roads, rural power supply, and purchasing capital are required.

k. Timing

An organizational study, purchase of the ENA or other facilities and the first drying and milling can take place before the end of 1982.

2. Discussion

a. Production and Consumption

Between 1975 and 1980, the annual Bolivian production of milled rice varied between 57,500 and 88,600 mt. Of this, some 10,500 to 12,600 mt (or 15,000 to 18,000 mt of paddy) came from the Chapare. In 1982, IICA estimated the annual Bolivian per capita consumption of rice as follows: La Paz, 12 Kg; interior cities, 18 Kg; rural areas, 14 Kg. The per capita consumption figures are relatively low, perhaps because of artificially high prices fixed by the Government. Historically, internal rice prices have been well above world levels. IICA (1982) concluded that Bolivian rice demand would grow by 20,000 tons between 1980 and 1990, while the Empresa Nacional del Arroz (ENA) estimated that it would be able to move about 6,000 mt more rice in 1982 than its available supply. Consumption growth is estimated at 10% per year.

ENA reports that Chapare rice is generally inferior to that produced elsewhere in Bolivia. This is probably due to the low level of rice production technology employed, which in turn is a function of the transient position of rice in Chapare cropping systems.

b. ENA and Chapare Rice Milling

There are numbers of small rice mills in the Chapare. Precisely at the conclusion of the 1981 rice milling season, ENA brought one of the largest and best of these. The mill, located near Villa Tunari, has a milling capacity of 200 qq (9.07 mt of milled rice) per day. Associated facilities include a 380 qq per 6-hour turn batch dryer, storages in Ivirgarzama, and a house. The purchase price is believed to have been US\$300,000.- The mill is 3 years old, in very good condition, and reportedly produces superior quality milled rice. ENA also operates a 30,000 qq store in the city of Cochabamba.

Since purchasing the mill in March, 1981, ENA has not used it. Problems are reportedly similar to those in the Wheat Marketing Division, MICT. Decision making is centralized in Cochabamba. ENA rice buyers live in Santa Cruz. There are no buyers resident at the mill. Rather, these come periodically (Three times in 1982) to see if there is any rice to purchase. The normal rice buying practice in the Chapare is to drive by farms, offering to buy, rather than to wait somewhere for campesinos to come to sell. ENA's 1982 purchasing capital arrived about March 1, after the harvest was 2/3 over. Finally, ENA fixed prices for the 1982 crop on March 27, after the harvest was completely over. In that there were no buyers at the mill, ENA did not use the standard local system, there was no purchasing capital, and prices were fixed after the harvest concluded, it is understandable that campesino rice sellers were absent when ENA buyers periodically visited.

In the past, ENA has purchased Chapare rice. In 1981, according to ENA's National Marketing Director, 800 mt of Chapare rice was purchased. ENA purchased this rice from intermediaries and millers, not from farmers or its own mill. ENA had a purchase target of 10,000 qq of Chapare rice for 1982. Against this target, no rice was actually purchased.

c. A Project Outline

Summarizing the rice production and marketing situation in the Chapare, a significant volume of low quality rice is produced. Marketing is outside the farmers' control. There is little or no effective state intervention. These problems are amenable to attack via a producer oriented marketing system.

It is suggested that a farmers' cooperative organization be formed, of a type common in the midwestern U.S. Owned, directed, and operated by farmers, this organization would purchase, dry, store, mill, and sell rice. Project ingredients would include the purchase of a mill, stores, drying facilities, transport, and associated equipment; acquisition of purchasing and operating capital; campesino training in bookkeeping, mill operation, and co-op administration; and perhaps other elements. With successful operation, both input supply and production technification schemes could later be added to co-op activities. A farmer's rice cooperative is a logical extension of the variety trials and seed improvement project now underway in the Chapare, under Taiwanese-CORDECO auspices.

Project Design - It is recommended that an effort of 2-3 man months be budgeted from first stage Chapare funds for the design, before September 1, of a campesino rice milling cooperative project. The key team members will be a Bolivian sociologist and a Bolivian marketing specialist. A food processing engineer will have a secondary role. The project should be designed on the basis of campesino recommendations, via consultations through Chapare sindicatos. The design would contemplate the purchase or construction of the requisite facilities and equipment. Campesino training to direct, administer, and operate the mill will be included. A suggested institutional organization of the mill will be part of the design.

The marketing specialist and sociologist who undertake this design can, at the same time, design any assistance to the development of campesino-operated tiendas de consumo, discussed in Section K, below.

Required Supporting Services - Rural power supply, rural access roads, purchasing capital, campesino training, and technical assistance will be required to support the project.

3. Estimate of Project Cost

A preliminary estimate of the costs associated with the design, purchase and operation of the mill, excluding non-purchasing capital operating costs, is:

	<u>US\$</u>
(a) The study (3 mm x \$4000)	12,000
(b) Purchase of works and equipment	300,000
(c) Construction of stores	25,000
(d) Rice purchasing capital (100 mt x \$232)	<u>232,000</u>
Total	<u>\$569,000</u>

This figure is a very rough estimate and should be more carefully estimated before it is included in a project paper.

It is suggested that first stage Chapare funds, obtained from Title III, be used to execute the study. The above project cost estimate, or a superior one resulting from the study, can be included in the PP, in anticipation that a rice marketing project will be part of the Chapare IRDP.

4. Documents and Persons Consulted

IICA. Diagnóstico Comercialización Nivel Nacional. La Paz, 1981

Hugo Trillo, Director de Comercialización, ENA, La Paz

Hoffmann, Karl; Guevara, Javier; and Cuellar, Juan. PRODES (equipo técnico residente en el Chapare), Cochabamba Tel. 4 5980

Hinojosa, Gilberto and Torrico, Armando. CORDECO Cochabamba, Tel. 2 8250-1.

\* \* \* \* \*

J. BANANA AND YUCCA DEHYDRATING

1. Background

About 15 years ago, a set of dehydrating equipment was brought to Bolivia and given to the Corporación de las Fuerzas Armadas para el Desarrollo Nacional, COFADENA. An early attempt to use this machinery to dehydrate vegetables in Santa Cruz was unsuccessful. The machinery was crated and transported to Cochabamba, where it has remained unused to the present.

In 1978, MACA estimated that some 384,000 mt of bananas were produced in the Chapare, on about 24,000 hectares. By 1985, this production may reach 450,000 mt on as much as 30,000 hectares. Bananas are a permanent crop, widely grown in the Chapare. Yucca is an annual crop, normally present at early stages in several common Chapare crop rotations. In 1978, it was estimated that there were about 100 hectares of yucca in the Chapare, with a total output of 1,500 mt. The supply and demand of both crops in the internal fresh market is believed to be about in balance, though large production expansion possibilities exist in both (Hanrahan and Hoffmann, 1979, Chapters II and V).

The possibility of dehydrating fruits and vegetables has been discussed by a number of writers. Baucom et.al. recommended against vegetable dehydration in the Chapare (1979, Ch. V.), but this recommendation covered potatoes, onions, tomatoes, carrots, and

other vegetables. Bananas and yucca were not separately considered. Buitrech et.al. (1982) discuss the dehydration of bananas, yucca, and forrages, without reaching specific conclusions. No market information covering dehydrated yucca and bananas was available at this writing.

PRODES is interested in the dehydration of these two crops, given the presence of the machinery, their Chapare production, and the possibility of a rapid project start.

#### Recommendation

Before any funds are committed to this project, it is recommended that its feasibility be studied.

## 2. The Study

The objective of the study will be to analyze the technical and economic feasibility of using the COFADENA machinery for the dehydration of Chapare bananas and yucca, and to recommend for or against a Chapare dehydrating project in these commodities. Engineering and economics will be of primary interest. Agronomy will be minor by comparison.

### a. Scope of Work for Engineering Services

An academically qualified and professionally experienced Bolivian food processing engineer will be contracted to perform the following services.

- (1) Examine the COFADENA machinery and assess its current condition in detail.
- (2) Determine whether the machinery is suitable for the dehydration of yucca and bananas.
- (3) Appraise the present dollar value of the machinery on the basis of replacement cost.
- (4) State the specifications for raw yucca and bananas that the machinery is capable of handling: size, degree of maturity, moisture content, uniformity, or any others of importance.
- (5) Estimate the first costs that would have to be incurred to put the machinery into use in the Chapare, to dehydrate yucca and bananas, including:
  - the purchase cost of equipment
  - the cost of any new equipment that would have to be purchased, so that yucca and banana dehydrating is technically possible
  - any reconditioning costs associated with the present equipment

- . the cost of moving the equipment to the Chapare and assembling it there
  - . the cost of associated civil works required to put the equipment into use to dehydrate bananas and yucca, and to store the final products.
- (6) State the technical operating parameters of the equipment, under at least three operating scenarios (output levels or final product mixes), including:
- . volumes of raw products to be processed
  - . mix, specifications, volumes of outputs, including wastes and by-products
  - . amounts of power and other utilities to be consumed, and their costs
  - . number and compensation of the associated labor force
  - . number, technical qualifications, and compensation of the associated managerial and administrative staff
  - . number of days per year and hours per day the plant will operate
  - . types, costs, and number of containers to be used, and their source of supply
  - . any other inputs or additives required, their costs, volumes, and sources of supply

Technical operating information is to be presented in sufficient quality and detail that annual operating and recurrent costs can be estimated without further analysis. Replacement schedules for machinery and equipment are to be prepared as a part of this task.

- (7) Present at least three alternative final product mixes specifying volumes of each product to be produced. Operating parameters from point (6) should be specified for each alternative.
- (8) Prepare a detailed narrative description of how the machinery is to be moved to the Chapare and put into operation, and a similar narrative of the dehydration process.

A written report covering all specified services, will be presented at the conclusion of the engineer's work. The engineer should hand this report to the economist not later than five weeks before the final feasibility report is due.

It is estimated that the engineering services will require three weeks and cost US\$5,000.

Academically qualified means the engineer will possess a professional, closely related engineering degree. He should have five years industrial food processing experience and be familiar with food dehydrating machinery.

b. Scope of Work for Economic and Agronomy Services

An academically qualified and professionally experienced Bolivian agricultural economist will be contracted to perform the following services:

(i) Analysis of Markets for Dehydrated Yucca and Banana Products

- (1) Determine raw and finished product prices and pricing points.
- (2) Prepare a list of names and addresses of prospective buyers, and approximate product volumes each will purchase per year. Compare this to present volumes of processed foods handled by these same buyers.
- (3) Determine final product specifications desired by the purchasers of the dehydrated products: container and label requirements, variety preferences, moisture content desired, nutritional parameters, health or phytosanitary requirements, terms of payment, or others. Special attention should be paid to this point on any export markets.
- (4) Compare market potential (points 2 and 3) with the engineering analysis of plant production capacities, considering the alternative final product mixes and volumes presented by the engineer.
- (5) Specify the size and product specifications (types) of the Bolivian processed animal feeds market, considering chicken, hog, cattle, or other feeds.
- (6) Name final product delivery points and tonnages, state shipment methods, and estimate the associated shipment costs.
- (7) Determine whether any seasonal patterns in buyer behavior will affect plant operations.

(ii) Production and Feasibility Analysis

- (8) Estimate the current acreage, yield, and production of Chapare bananas and yucca. If these are below the plant's raw product requirements, estimate the short term production expansion possibilities in these crops, considering especially their financial attractiveness to campesinos.

- (9) Estimate costs associated with any plant input not estimated by the engineer.
  - (10) Evaluate the financial feasibility of the best final product mix proposed by the engineer, using standard project worth estimators, and prepare a 10 to 15 year financial pro-forma, showing:
    - . investment, or first, costs and subsequent replacement costs.
    - . annual cash operating costs
    - . revenues and net returns
- (iii) Institutional Analysis
- (11) Recommend an implementing agency, or a suitable institutional organization for the plant.
  - (12) Propose an organization of raw product supply from campesinos and raw product purchasing by the plant. Recommend for or against the use of raw product purchasing contracts.

A final written project report, covering all specified services, and including the engineers report, will be presented at the conclusion of the agricultural economist's work. The economist will be responsible for the overall content and preparation of the project final report.

It is estimated that the agricultural economist's services will require nine weeks and cost US\$10,000.

Academically qualified means the agricultural economist will possess a Licenciado, Masters, or Ph.D. degree in economics, agricultural economics, or business administration. He should have five years professional experience, including the preparation of feasibility and market potential reports in agricultural processing industries.

3. Provisional Estimate of First Investment Costs  
PRODES estimates the cost to purchase the COFADENA equipment at US\$1.0 million. An additional US\$150,000 would be required to recondition, move, and install it.

Since the plant's technical parameters are not known, it is not presently possible to estimate requirements for either purchasing or operating capital.

4. Documents and Persons Consulted

PRODES Dr. Winston Estremadoiro, Executive Director, Prodes, Cochabamba. Tel 4 5980

Duplache, Francisco and Landes, Hugh C., Proyecto de Desarrollo Integrado del Chimoré, "Agroindustrial Possibilities - The Dehydration of Yucca, Bananas, and Forrages." PRODES, Cochabamba, March, 1982. Tel. 4 5980.

Baucom, et.al. Cacao, Spices, and Dehydrated Vegetable Study for the Chapare Region of Bolivia (Chapter V - Dehydrated Vegetables). La Paz, October, 1979 (USAID Library Report # R-C-009).

\* \* \* \* \*

K. INPUT SUPPLY

Time did not permit a survey of Chapare input dealers. Volume and types of agricultural inputs moved, items available, prices, and so on are not known. Normally, inputs in the Chapare are supplied by re-sellers, who purchase in Cochabamba, and re-sell in the Chapare in small volumes at high markups. Input supply in volume does not exist, consequently, inputs are very expensive. This is expected to be a major project bottleneck, as production is intensified and non-traditional crops are introduced.

At this time, three highly successful tiendas de consumo function in the Chapare. These are the Tiendas de Consumo San Miguel, Bolivar, and Gualberto Villarroel. All are in the Chimoré. The tiendas bulk purchase fertilizers, pesticides, chain saws, tools, and other inputs. Orders are taken from syndicato members, and the inputs are purchased in Cochabamba. Reported savings to members are 20-50% on the cost of inputs purchased. The stores are very popular with their campesino member-owners.

a. Recommendation

It is recommended that the Chapare IRDP strengthen these stores, and aid in the formation of new ones. To do so, a sociology study is recommended. A Bolivian rural sociologist would work with the existing stores, and with syndicates, to design a project to assist and develop more stores. The Chapare IRDP might make loan capital

available, construct buildings and stores, and train campesinos in accounting and store management. Between now and September 1982, the same marketing-sociology team that designs the rice milling cooperative can simultaneously design this project. About one extra month would be required to recommend this project design. In the present case, identification of a suitable implementing institution will be critical.

b. Documents and Persons Consulted

Hoffmann, Karl; Guevara, Javier; and Cuellar, Juan. PRODES (resident Chapare technical team), Cochabamba, Tel. 45980.

\* \* \* \* \*

III. OTHER MARKETING TOPICS

A. PRICE AND VOLUME DATA

1. Background

A number of writers have claimed that market news -such as price and volume information, or the level of purchasing and selling activity is scarce in the Chapare. This puts farmers at the mercy of intermediaries. In the absence of such information, planning is less precise. For example, decisions to expand production may be uninformed.

The División de Comercialización (DC), MACA, now operates a rural and urban market news service. In the cities of La Paz, Cochabamba, Santa Cruz, Potosí, and Sucre, DC enumerators periodically visit wholesale and retail markets, and housewives. A standard form is filled out. The form is then summarized, encoded, and forwarded to DC, La Paz, where the data are published every six months in the DC's Boletín de Noticias de Mercadeo Agropecuario series. The form includes price data, and a descriptive appreciation of the approximate volumes and origins of the commodities present in the market (Hanrahan and Hoffman, 1979, page III-50).

The city of La Paz has four enumerators, thus La Paz markets are visited daily. Cochabamba has one enumerator, who is able to visit only every two days.

In La Paz, these price data are summarized on a single news bulletin, translated into Aymara, and broadcast Mondays, Wednesdays, and Fridays on Radio Illimani. DC's La Paz resources permit this, but the present level of Cochabamba and Santa Cruz resources (staff, vehicles, and materials) does not.

In 1980, the University of Florida undertook a sociology research project which analyzed means of communication in the Chapare (Delaine and Van Crowder). This research defined the frequency by days, by times, and by program types of the Chapare campesino radio listening. Of all Chapare households, 73% had a radio in the house (Page 49). At least 8% of all Chapare campesinos listen to the radio daily. Radio listening is especially heavy on Saturdays, Sundays and Mondays, when 61%, 80%, and 23%, respectively, of campesino households listen (Page 50). Radio listening is heaviest during the early morning and early evening. The hours of 06:00 to 07:00 and 19:00 to 20:00 are the peak times (page 53). Local and agricultural news programs are the most frequently listened to program types (page 56). The research also defined the most frequently listened to radio stations (page 54).

## 2. Project Activity

As a part of the Chapare IRDP, it is proposed to extend DC's native language market news broadcasts to the Chapare and Santa Cruz, and to refine and expand the commodity volume and quantity data gathered, published, and broadcast.

The increase of DC's native language broadcasts will involve more frequent market visits, the collection of additional information, the preparation of radio bulletins by DC staff, the translation of these bulletins into Quechua, and their delivery to selected radio stations. Participant stations will have to be identified and their cooperation secured. The latter task will be facilitated through the existing agreement between MACA and Escuelas Radiofónicas de Bolivia, ERBOL (see Delaine and Van Crowder, page 157).

To achieve this purpose, DC's Cochabamba and Santa Cruz offices will be strengthened through the addition of resources at project and at GOB cost.

Required resources will include: the addition of one DC's staff person to each office, the purchase of two vehicles, and the provision of a small budget for materials purchase (paper). The Director of Commercialización, MACA, has been briefed on this idea, and is in full accord with adding this activity to the normal functions of his office.

Project Cost - The Director of DC is presently preparing a cost estimate for the activity just described. This will be sent to ROD-USAID, La Paz during April 1982.

There is no reason why MACA cannot be required to support part of this effort, for example, the addition of adequately compensated staff, under the Chapare IRDP project agreement. A similar approach was taken when the GOB was forced to strengthen the División de Sanidad Vegetal, under the PL 480 Title III project agreement.

### 3. Document and Persons Consulted

Arteaga, Freddy and Sánchez, O.T. El Sistema de Información de Mercado, su Finalidad y Problemas. MACA, Departamento Nacional de Mercadeo Agropecuario, La Paz, Agosto, 1981.

Delaine, B. and Van Crowder, L. Los Medios de Comunicación en el Chapare. UFLA-IFAS, Documento de Trabajo No. 26, La Paz, 1980 (USAID Library No. UFLA-IFAS 26).

Hanrahan, M. and Hoffmann, R. Market Potential for Bolivian Citrus and Tropical Fruits. USDS, La Paz, October, 1979 (USAID Library Report No. R-M-005).

Arteaga, Freddy. Director de Comercialización. MACA, La Paz

## B. THE MARKETING ROLE OF PRODES

During a field visit to Cochabamba, PRODES was asked what specific activities it, as an institution, would implement in the Chapare. Activities mentioned were the production of plants in central nurseries, the operation of integral agricultural service centers, the employment of promotion agents, and project administration.

Experience at regional development corporations has shown that it is sometimes desirable to centralize commodity sales. Several RDC's have marketing departments. These sell the produce from enterprises operated by the RDC's. With time, such a role may develop for PRODES, as an alternative to leaving commodity sales decentralized in each discrete project.

\* \* \* \* \*

\* \* \*

\*