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EVALUATION  
OF  
CHAPARE REGIONAL DEVELOPMENT PROJECT

PREPARED FOR USAID - BOLIVIA  
UNDER CONTRACT N° 511 - 067 - C - 00 - 6130  
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LIST OF ABBREVIATIONS

CP	Chapare Regional Development Project
EI	Experience Incorporated (Project TA contractor)
SDBT	Secretaría para el Desarrollo del Trópico Boliviano
IBTA	Instituto Boliviano de Tecnología Agropecuaria
Ha	Hectare (2.47 acres)
PP	Project Paper
TA	Technical Assistance
CORDECO	Corporación Regional de Desarrollo de Cochabamba
FENACRE	Federación Nacional de Cooperativas de Ahorro y Crédito
PRODES	Proyecto de Desarrollo del Chapare - Yungas
MACA	Ministerio de Agricultural y Asuntos Campesinos.
UPD	Unidad de Producción Demostrativo (Demonstration Production Unit)

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## EXECUTIVE SUMMARY

### INTRODUCTION

This report evaluates the progress of the USAID Chapare Rural Development Project (project No. 511-0534, loan No. 511-T-067) which was signed with the Government of Bolivia in August, 1983. Interviews (Appendix A), field observations, review of project documents and report preparation was conducted between August 4 and September 19, 1986 by a team composed of two agricultural economists, an agronomist, and an environmental specialist. Approximately 30% of the consultants' time was spent in the Chapare and Cochabamba and the remaining time was devoted to interviews and report preparation in La Paz.

### ISSUES AND RECOMMENDATIONS

#### Project Strategy

Issue: A central premise to the success of the Chapare Project was the successful control of coca production. This was not achieved until July 1986, nearly two years after the project began, and it is still too early to tell if this control effort will be sustained. However, experience to date has clearly demonstrated that coca control is indeed essential to the achievement of project goals.

Furthermore, the initial project design was overdimensioned; there were too many components and diversified activities to be successfully implemented in the conflictive environment of the Chapare. Despite the lack of coca control, there has been a tendency to use the Project Paper as a rigid recipe for development, an approach which was too inflexible for socio-economic and ecological conditions in the Chapare. It has been impossible to implement many of the Project's components due to the lack of coca control.

Recommendations: If the currently successful coca control effort cannot be sustained, it will not be possible for the Chapare Project to achieve its goals. Project funds should be reprogrammed into new project components outside of the Chapare (eg. Cochabamba Valley or other highland areas) which can reduce migration pressure into the region.

If coca control efforts continue to be successful, approximately US\$3 to 5 million of unused funds originally earmarked for agroindustrial credit will be available for reprogramming. These funds should be reprogrammed into new project components in the Cochabamba Valley which could reduce migration pressure into the Chapare (eg. small scale irrigation improvement, livestock and forage, small grains, vegetables, and community infrastructure).

A survey of potential new project components in the Cochabamba area should be initiated as soon as possible to establish the basis for the design of this new Project component.

The existing Project components within the Chapare region need to be carefully focused on the areas of highest priority: (1) continue to recruit and train of promoters, (2) develop and demonstrate technological packages incorporating annual, perennial and agroforestry crops, (3) prepare and disseminate appropriate extension/research publications, (4) discard the large agroindustry component and refocus on small agroindustry and marketing activities, and (5) initiate a pilot farm credit program in an area having minimal coca production in preparation for an expanded credit program should coca control be successful.

Project personnel have been able to gain farmer confidence in large part because the Project has not been openly associated with coca eradication efforts. This distinction must be vigorously maintained.

#### Project Administration

Issues: The Chapare Project (CP) is an ambitious undertaking in a difficult environment and as such requires substantial administrative guidance. Project implementation has been impeded by the failure of USAID to assign adequate Project Management resources and long delays in procurement. These problems in turn have permitted or exacerbated administrative difficulties at the level of the implementing agencies.

Although most Project activities are in the Chapare, Project administrative offices remain in Cochabamba, approximately 180 km from the Project area.

Recommendations: USAID must recognize that adequate Project Management resources must be allocated if projects are to achieve the desired level of performance, particularly in a project as large and complex as the Chapare.

USAID should assign a Project Manager who has at least 1/3 of his time available for the CP, with an assistant who will spend at least 1 week per month in the field (Cochabamba and Chapare) to handle on-site coordination, technical review and troubleshooting.

The project has suffered from substantial procurement delays, not all of which have been resolved to date. USAID must streamline its procurement activities if the Chapare or other projects are to be implemented in a timely manner. Additionally, IBTA/Chapare and SDBT must follow-up on procurement problems in a more aggressive and organized fashion.

Project administrative offices (SDBT and IBTA/Chapare) should remain in Cochabamba, despite the distance from the Project area. There is no basic infrastructure in the Chapare (eg. electricity, telephones, housing), the extremely humid environment will damage office equipment (xerox, computers, etc.), and most administrative tasks (bid quotations, purchase of material, coordination with other agencies) must be done in Cochabamba.

Issue: There is a paucity of tangible results in some components of the Project because the objectives have not been clearly conceptualized and translated into an aggressive course of action. The development of technological packages incorporating previous experience (eg. MACA-PRODES-IICA, 1982), economic analysis, perennial crop research and agroforestry activities could have benefited from stronger guidance by the Experience Incorporated TA team.

Recommendation: In a project such as the Chapare the TA team is a critical catalytic ingredient. The TA team needs to take a more aggressive role in the planning and execution of research activities plus the synthesis, implementation and analysis of technological packages incorporating both annual and perennial crops. Emphasis needs to be placed on the technical and economic evaluation of cropping systems, giving particular attention to intercropping strategies which can reduce investment and credit requirements for perennials.

#### Refocus of Project Activities

The evaluation team has identified seven basic improvements in Project focus which can produce more effective results.

Issue: A "cropping system" approach has not been emphasized in the project and has been completely ignored in the economic analysis undertaken to date. Yet Chapare farmers typically grow a sequence of crop mixtures rather than monocultures. Mixed cropping of annuals with perennials are particularly important to offset the establishment cost of perennials.

Recommendation: IBA/Chapare and EI should give greater attention to the establishment of perennial crops and intercropping systems based on annuals plus perennials. Intercropping strategies should be explicitly considered in all economic analysis, and particularly in any analysis that will be used as a basis for determining credit requirements.

Issue: The Chipiriri Experiment Station is located in the wettest part of the Chapare, an environment which is not only ill-suited for agricultural production but which is also atypical of most of the Chapare. Because of environmental conditions, the Chapare is ill-suited for cattle production. Furthermore, colonists have demonstrated relatively little genuine interest in livestock.

Recommendation: The dairy production, water buffalo and pasture/forage components of the Chapare Project should be eliminated. The resources consumed by these components could be used more productively elsewhere. The livestock component should be limited to swine production and small animals.

All research on citrus and field crops at Chipiriri should be discontinued and refocused into the drier zone near Puerto San Francisco on UPDs and the experimental sub-station proposed for the area.

The SDBT and USAID should seriously consider constructing new housing at Villa Tunari rather than at Chipiriri. Road access to Puerto San Francisco is better from Villa Tunari than Chipiriri; the latter road requires two river crossings which are impassable during rainy periods.

Issue: In the absence of follow-up funding, research and extension activities in the Chapare will cease at the termination of USAID funding. This makes it essential that all research extension activities be conducted and designed to produce a lasting benefit to the region.

Recommendation: The three principal instruments of change which the Project can leave in the Chapare are: (1) trained promoters, (2) research results that document improved technological packages, and (3) new and improved genetic material.

Although recruitment and training of promoters has proceeded well to date, we wish to call attention to promoters due to their importance. The highest possible attention and priority should be given to the recruitment and training of promoters. Recruiting should focus in areas already serviced by extension agents. This will minimize travel time and allow extensionists to concentrate their efforts to the point that visible improvements can be achieved in the communities already served.

Research results must be published in a form suitable for use by promoters and farmers, disseminated throughout the Chapare, and used as the basis for all promoter training classes. It does not matter that 90% of these publications are discarded, but it is important that they be available for the 10% who are innovative and are willing to use them. Immediately establish an editorial committee, hire a competent editor, plan the publications to be produced during the next two years, and publish as rapidly as possible, and use these publications in promoter training. Intensify efforts to acquire new and improved genetic material, and make arrangements for the commercial production of annual seeds in a zone outside of the Chapare.

- \* Issue: There has been no useful implementation of the Chapare Project component calling for market services and an Information clearinghouse.
- \* Recommendation: Market services are among the most important components of the Chapare project. SDBT should promptly assign an individual the responsibility of collecting and disseminating information on market prices. SDBT should also improve the capacity for making preliminary studies on proposals for small and medium business to determine their relevance to the Chapare Project (however, financial analysis should be made by the lending institution). There is no need for a separate Information Clearinghouse.
- \* Issue. Establishment of large agroindustry to provide demand-pull and consequent enlarged markets for farm products is a principal component of the Chapare Project. To date only three industries have been identified as suitable. None will have a significant early impact on Chapare incomes and no additional good agroindustrial prospects are in sight. Of the requisites for successful agroindustry - abundance and assured supply of raw materials, adequate infrastructure (roads and electric power), processing and transportation costs competitive with other areas, well defined market possibilities, reasonable security for capital investment, and potential for growth - Chapare has only the last.

Although small agroindustry development is a component of the Chapare Project, no significant progress has been made. However any substantial growth in Chapare agriculture and livestock will establish quickly a need for small agribusiness facilities, particularly for perennial crops (coffee, cacao, tea) and minor specialized crops (essential oils, ornamental plants, etc.). Also there may be an opportunity for hog breeding operations. Improving Chapare meat and fish supplies by assisting modestly the frigorifico and ice plant in Puerto Villarroel is another possibility. The present small industry concept - under \$20,000 investment and full bank guarantee - may not be adequate.

Recommendations: The present concept emphasizing the use of Chapare Project funds for developing large agroindustries is inappropriate and should be removed from project strategy and design, subject to the following:

- a) Implementation of the fruit processing project in Cochabamba can support the gradual establishment of greater fruit production in Chapare and should be completed if possible.
- b) The commercial swine fattening project should be replaced by a hog improvement program, including a medium scale agroindustry in Chapare with facilities for breeding, supplying feed, and assisting small farmers with veterinary services and marketing.

- c) The particle board operation should be re-evaluated as to the extent of the financial commitment which may now exist and the practicality of its proposed raw materials acquisitions in Chapare.

Agroindustrial emphasis should be shifted to the development of small scale processing industries within the Chapare and marketing of Chapare products locally to Cochabamba, and to Santa Cruz when the new road is completed.

The Project should be altered to provide funding possibilities for small and medium scale agroindustry with maximums of \$50,000 for small and \$250,000 for medium. Total requirements in the next three years will be small, not exceeding \$500,000 annually. Emphasis should be on facilitating crop and livestock production, including negotiated guarantees when full loan guarantees are not available.

Principal responsibility for identifying small and medium agroindustry development should be placed on SDET. Provision should be made for specialized short-term consultants as needed. Utilizing the International Executive Services Corps could be helpful.

- \* Issue: Formal financial market activity in the Chapare is insignificant when compared to the number of farmers and overall level of economic activity. Only two bank branches exist in the region. For all practical purposes there is no formal credit delivery system in the Chapare and few farmers have access to credit. There is almost no mobilization of savings in the Chapare by financial institutions.
- \* Issues: Although agricultural credit is not required for crop diversification, it will probably be important to promote efficient commercialization of crops such as coffee which require processing. Credit can be used to concentrate production into a particular geographic area and stimulate production volume to levels required to support a processing center.

As constraints, most farmers have relatively modest credit needs (eg. \$1-4,000) and no prior experience with credit. Furthermore, their lack of savings, despite income from coca, suggests that their financial management abilities are weak.

Recommendations: Credit activities in the Project should not be limited merely to disbursing loans, but should give much greater attention to strengthening the financial infrastructure in the Chapare by assisting to reconstruct

credit unions, encouraging financial intermediaries to become more aggressive and innovative in mobilizing deposits, and related activities which will assist to develop efficient financial infrastructure.

Lending plans should be scaled down. If coca repression continues there should be a special consideration for medium-term (3-4 years) loans for the establishment of perennial crops.

Short-term (1 year) and mid-term (3-5 years) credit should be available to farmers in amounts of \$5,000 or less. A short course (1 day) in financial and credit management should be developed and delivered to credit applicants by SDBT, and successful completion of the course should be a pre-requisite to credit approval. This course should be offered in the Chapare.

The alternative of using cooperatives or "Grupos Notariados" for provision of group credit should be encouraged, since this will greatly reduce the lender cost as opposed to the execution of individual credit instruments with many small farmers.

OVERALL PROJECT ANALYSIS AND RECOMMENDED STRATEGY

PROJECT BACKGROUND

Project Design

Location. The entire Chapare region encompasses an area of approximately 2.5 million Ha. at the foot of the eastern slope of the Andes. The project focuses on a 422,000 Ha portion of this region which has become the focal point of coca production as a result of favorable environmental conditions and transportation infrastructure (Figure 1).

The project area has been divided into 9 micro-regions covering 6 life zones. The principal town in the project area is Villa Tunari, about a 4 hour drive from Cochabamba. A new highway currently under construction will cross the Rio Ichilo and link the Chapare region with Santa Cruz within approximately two years.

Project goal. "To stimulate balanced economic development and an enhanced standard of living in the Chapare region resulting from a mixture of public and private sector participation, a diversified economic base and more equitable income distribution" (Project Paper, p. 25)

Project purpose. "To modify and improve the agricultural and forestry systems of farmers in the Chapare to respond better to diverse, profitable marketing opportunities provided under sustained, environmentally acceptable, medium technology production models" (Project Paper, p. 25)

General Strategy. "Realization of the project purpose is based on a demand pull strategy through which enhanced marketing of agricultural and forestry commodities will stimulate increases in production and, by extension, an improved income and standard of living for Chapare farmers." (Project Paper, p. 25).

Timetable and funding. The project has been designed for implementation over a five year period with a total budget of US \$36 million (Table 1). Disbursements and balance of funds are summarized in Table 2.

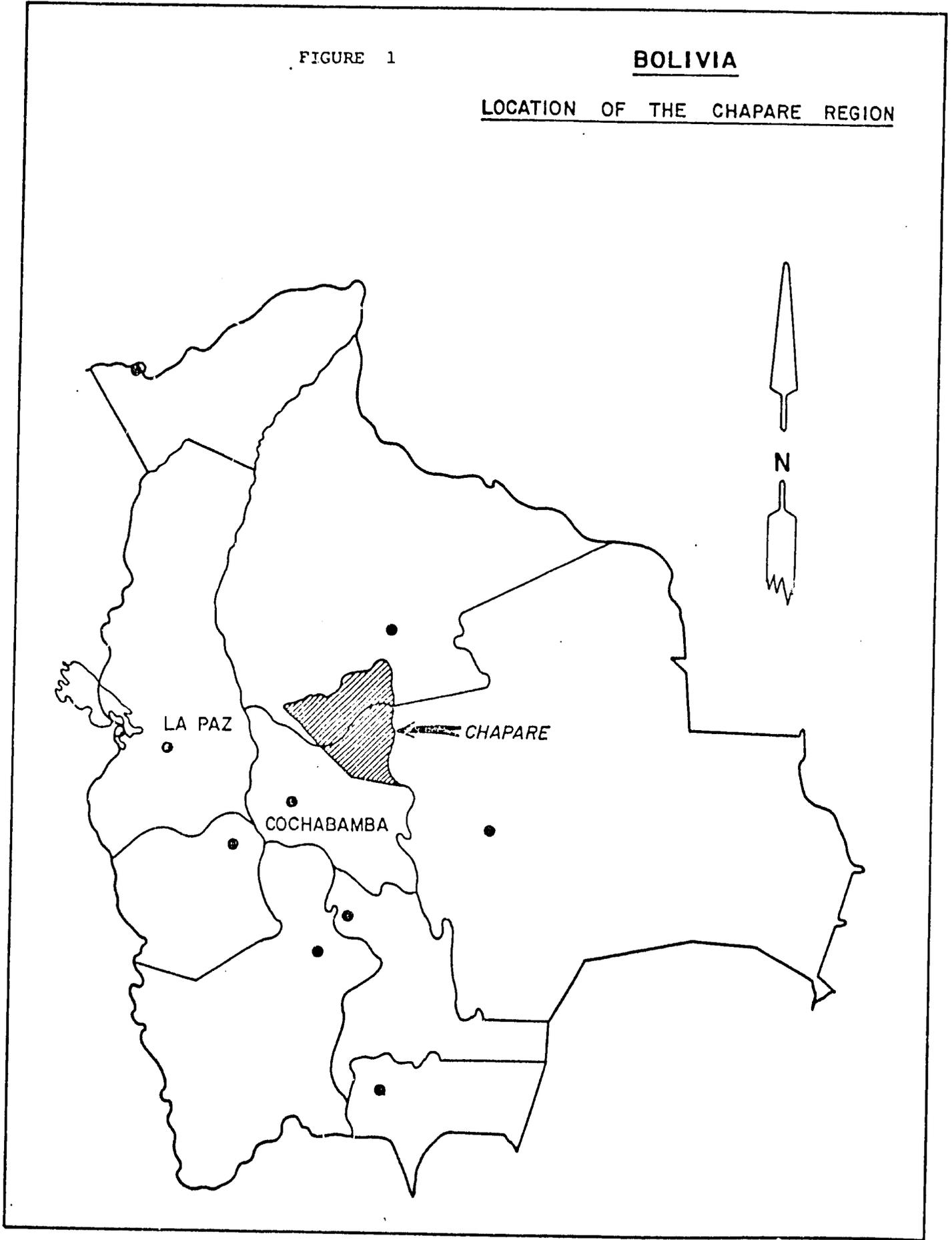
TABLE 1: SUMMARY PROJECT BUDGET (thousand of \$US)

Component	USAID	Host Country	Total
Agribusiness Dev. & Marketing	5,258	9,741	14,999
Administration & Institutional Dev.	1,850	267	2,117
Agricultural & Forestry Production	6,816	11,855	18,671
Contingency	476		
Totals	14,400	21,863	36,263

FIGURE 1

BOLIVIA

LOCATION OF THE CHAPARE REGION



# CHAPARE

FIGURE 2

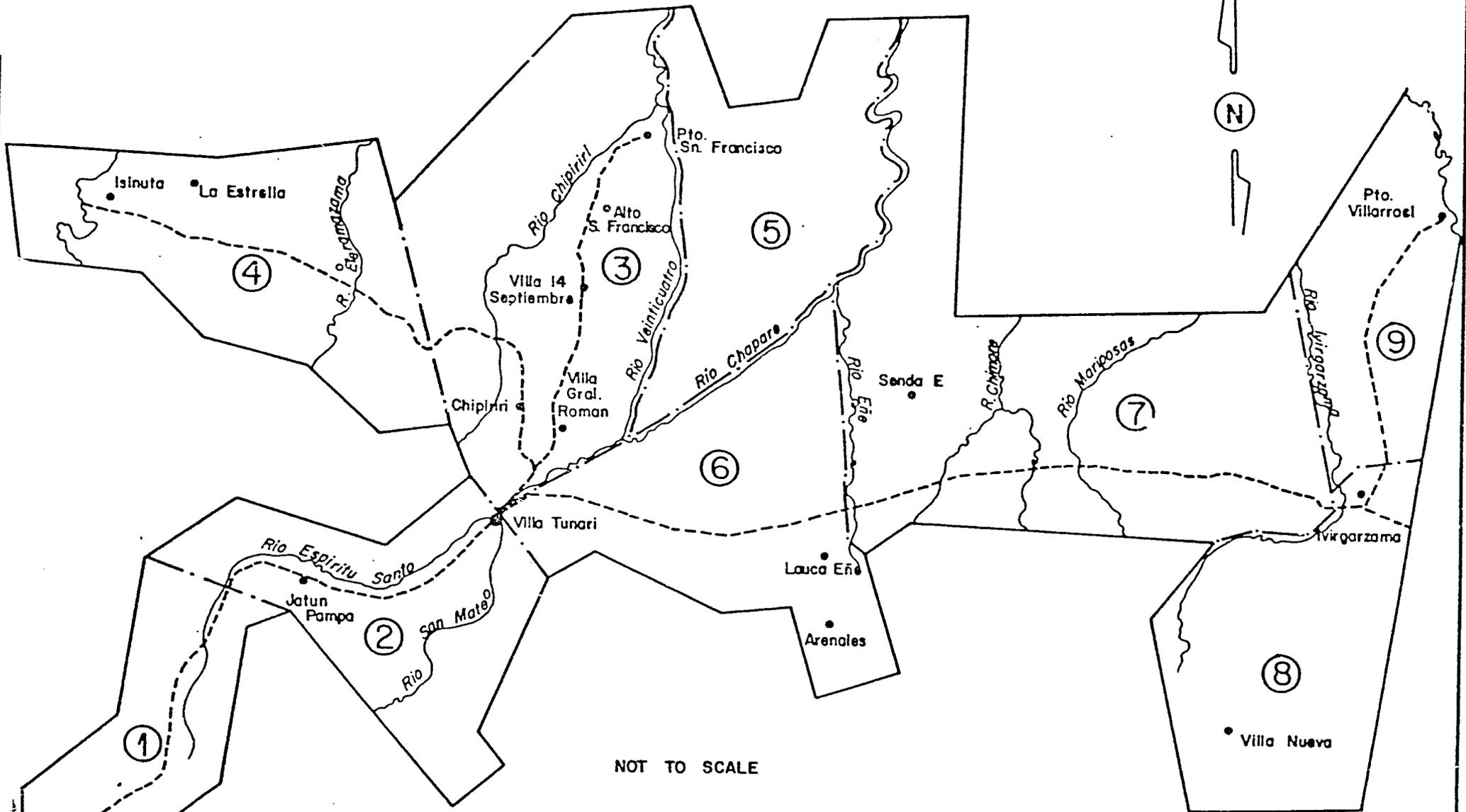


TABLE 2: ILLUSTRATIVE FINANCIAL PLAN AS OF JUNE 30, 1986(US\$000)

	A. I. D.			A. I. D.			A. I. D.		
	Grant	Loan	Total	Grant	Loan	Total	Grant	Loan	Total
<u>03 Institutional Development</u>									
1. SDTB	978	872	1,850	4	384	388	974	488	1,462
2. Banco de Cochabamba	-	-	-	-	-	-	-	-	-
	<u>978</u>	<u>872</u>	<u>1,850</u>	<u>4</u>	<u>384</u>	<u>388</u>	<u>974</u>	<u>488</u>	<u>1,462</u>
<u>01 Agricultural and Forestry</u>									
<u>Production</u>									
1. FENACRE	477	-	477	196	-	196	281	-	281
2. IBTA	2,725	2,611	5,336	1,007	1,046	2,053	1,718	1,565	3,283
3. CORDECO	220	-	220	-	-	-	220	-	220
4. Farmers Federation	-	-	-	-	-	-	-	-	-
5. Research & Extension	-	783	783	-	-	-	-	783	783
6. Agricult. Prod. Credit	-	-	-	-	-	-	-	-	-
7. Farmers Organization	-	-	-	-	-	-	-	-	-
Marketing Credit	-	-	-	-	-	-	-	-	-
	<u>3,422</u>	<u>3,394</u>	<u>6,816</u>	<u>1,203</u>	<u>1,046</u>	<u>2,249</u>	<u>2,219</u>	<u>2,348</u>	<u>4,567</u>
<u>02 Marketing-Agroindustrial</u>									
<u>Development</u>									
1. Citrus	-	1,368	1,368	-	-	-	1,368	1,368	1,368
2. Swine	-	1,368	1,368	-	-	-	1,368	1,368	1,368
3. Particle Board	-	1,080	1,080	-	-	-	1,080	1,080	1,080
4. Kudzu	-	692	692	-	-	-	692	692	692
5. Small Industries	-	750	750	-	-	-	750	750	750
		<u>5,258</u>	<u>5,258</u>				<u>5,258</u>	<u>5,258</u>	<u>5,258</u>
	<u>4,400</u>	<u>9,524</u>	<u>13,924</u>						
<u>04 Contingencies (5%)</u>									
	-	476	476	-	107	107	-	369	369
	<u>4,400</u>	<u>10,000</u>	<u>14,400</u>	<u>1,207</u>	<u>1,537</u>	<u>2,744</u>	<u>3,193</u>	<u>8,463</u>	<u>11,656</u>

### Unique Features of The Chapare Project (CP)

Although the Chapare Project (CP) may appear to resemble other integrated rural development efforts, it is different in several very important respects. Some of these distinctive features have negative implications for development efforts in general and financial market activities in particular.

For example, (1) unlike many area development programs that stress taking advantage of crops and enterprises in which the area has a comparative advantage, CP is trying to reduce or eliminate the activity that is the most profitable. (2) The CP has an unusually large number of agencies involved which compounds coordination and communication problems. This is mainly because of the coca control-and-reduction parts of the program. (3) Due to security reasons plus lack of infrastructure, much of the leadership and many of the technicians working on CP live and do a good deal of work outside the Chapare. (4) The project started in the midst of a hyper-inflation which severely affected all financial institutions, bankrupt the Banco Agrícola Boliviano, wiped out personal savings, affected project disbursements, and generally produced a period of tremendous economic uncertainty and distortion. (5) The Bolivian economy has been severely depressed, dampening the ability and interest of entrepreneurs to invest in new activities in the Chapare and limiting the markets for many of the products that might be produced there. (6) The widespread illegal coca production, combined with attempts to control coca, results in a significant amount of absentee land ownership, high wages caused by extremely profitable coca production, and genuine security concerns. (7) The Project area was selected, not based on a high agricultural potential, but because it is felt to be world's largest single zone of coca leaf production for illicit drug market. The Chapare soils and climate are only marginally suited for agricultural development and (8) the road system has deteriorated and major bridges and culverts have been washed away. Until a new road connects the Chapare with Santa Cruz, the CP is a long way from major domestic or international markets, aside from Cochabamba. Even with the new road to Santa Cruz it is unlikely that many of the products from the Chapare will find substantial new markets. Thus, most new agricultural enterprises that might be stimulated in the Chapare face thin markets.

Nevertheless, several unique features of the Chapare are a plus for development. (1) It has a high degree of farmer organization that is not usually found in colonization areas. (2) Virtually all of the farmers are commercialized: they buy inputs and sell a substantial part of their products. Chapare farmers understand how to interact with a monetized market. (3) Most Chapare farmers are hard working, willing to experiment, and quick to adopt profitable technological changes: the recent explosive growth of the coca industry is proof. (4) Because of differing micro climates and soil conditions, resources in the Chapare allow the production of a variety of products.

### Accomplishments to date

Despite severe constraints including lack of coca control, significant progress has been made (Table 1). Most importantly, IBTA/Chapare extension agents have gained the confidence of farmers in the area and have succeeded in establishing limited on-farm plantings of non-coca crops, PIOR to the collapse of the coca market in July 1986 due to control efforts.

However, little progress has been made in the credit and agroindustrial components due to the failure to control coca production, hyper-inflation and related problems in the national economy, and the high level of financial risk associated with investment in the Chapare region. The extension of credit to farmers has been intentionally delayed by USAID because, without coca control, it was felt that these credits could be used to increase coca plantings.

### Population in the Chapare

How many people live in the Chapare and how will coca control affect this population?"

The Chapare has exhibited explosive population growth fueled by the continuing colonization and the labor demand associated with coca production. The Chapare population can be broken down into three groups:

COLONISTS have been arriving in the Chapare region in significant numbers since the 1940s. Their principal reason for moving into the Chapare was, and continues to be, a lack of opportunity in their native areas on the Altiplano and Valles Altos. This migration is fueled by Bolivia's high population growth rate (2.8% per year) plus, during the current decade, the lure of coca income. Although colonists arrive from all parts of Bolivia, migrants from the Cochabamba area are particularly numerous. This general migration pattern is typical of the general expansion of population into the Andean lowlands throughout Latin America.

Although virtually all colonists grow coca, interviews with colonists suggest that most of them will remain in the Chapare despite depressed coca prices because they have no better place to go. To paraphrase typical comments. "My father's farm was divided among several brothers, I could not find steady work. The Chapare is hard, but here we can grow food if things get bad."

COCA GROWERS include colonists or absentee landowners who earn significant profits from this activity, and typically invest a substantial portion of their earnings outside of the region. This group includes coca farm caretakers or sharecroppers working for an absentee landowner. It is hypothesized that many of these people will leave the region if coca prices remain low.

LABOR AND SERVICES. As a result of the coca boom this is the most numerous group in the Chapare. These are transients who do not hold land in the region but work as field labor, coca "pisadores", etc. Some of these may eventually colonize the area, but most of them will return to their native communities where they may have a small landholding. Most of these people have left the Chapare during the past two months due to the collapse of the coca market.

The project attempts to provide services exclusively to the first group, the colonists.

There are no reliable statistical data on the Chapare population. In the PP the project area was estimated to contain 12,000 families with a total population of 60,000 dedicated to slash and burn agriculture with coca typically being the principal cash crop. More recent estimates of employment are shown in Table 4.

TABLE 4: EMPLOYMENT AND AREA UNDER CULTIVATION IN THE CHAPARE REGION (Source: USAID/BOLIVIA, 1986).

	FY 1985 (base)	FY 1986 (estimated)
Employment:		
* Coca leaf production (direct and indirect)	100,000	105,000
* Non-coca related	5,400	5,600
Area in Cultivation (hectares):		
* Total	75,000	79,000
* Coca	32,500	33,500

Narcotics control personnel in the U. S. Embassy have estimated that there may have been 300,000 or more people in the Chapare prior to recent enforcement efforts. Other estimates range as high 650,000.

Today, following enforcement, estimates of total population range from 75,000 to 250,000. Most of the labor and service personnel have left the area, at least temporarily, as well as probably some of the coca growers. A more reliable estimate of the Chapare population is needed as a basis for planning future Project and control efforts.

#### Human Carrying Capacity

Recent undocumented estimates of Chapare population range from 75,000-250,000 people (15,000-50,000 families). Multiplying the average of these estimates (32,500 farms) times the average farm size (15 has) gives a total settled area (487,500 ha) larger than the project area. There exists every possibility that colonists have settled outside the boundaries of the project, but there is no documentation to support this hypothesis or the validity of the population or farm size estimates.

In the Chapare environment, approximately 15 Ha of land are needed to support a single family in a sustainable manner at existing levels of technology. Assuming that our previous calculations are reasonable, then human carrying capacity of the Chapare using traditional food production technology has already been exceeded. The area's large population is being supported by coca income, which permits the importation of foodstuffs into the Chapare on a large scale.

If coca repression continues some farmers on marginal lands may migrate. Their vacated lands could then be consolidated to larger farms, re-settled by new colonists, or passed on to relatives. In no case will the land be abandoned since land ownership has a high social value.

It is recommended that a more accurate estimate of the colonist population and remaining area of unsettled lands be conducted to better determine the available options for both development and control programs.

Economics of Coca Production

Effective coca control was not achieved until mid-July 1986 when U.S. helicopters arrived in Bolivia to support raids against drug laboratories in the Beni. The dramatic success of this effort is reflected in the price of coca leaf in the Chapare.

Normal price	US \$200-300/carga
Peak 1985 price	US \$800/carga
July-August 1986 price	US \$15-50/carga with very limited or no market

During field visits the first week of September 1986 very little harvest activity was observed. Colonists in the Chapare report that the only market available for coca leaf at present is the legal market, which is paying US\$ 20/carga.

Future price levels cannot be predicted. They depend on the efficiency of continued enforcement efforts and the ability of producers to shift to smaller and more clandestine processing operation (similar to the "guerrilla agriculture" practiced by U.S. marijuana growers).

A crop budget for well managed coca production is reproduced in Table 5, which suggests that coca production will cease to be an economically attractive activity with a price under \$30/carga, even on fields which are already established. On a less suitable soils where yields are lower, a higher price (say \$50/carga) might be required to make continued production attractive. Colonists who were interviewed indicated that a price of \$50-100/carga would be required to make coca an economically attractive crop. However, even at low prices some production will undoubtedly continue for local use and as a cash crop where family labor is available and no alternative economic activity is present.

TABLE 5: CROP BUDGET FOR MAINTENANCE OF A PREVIOUSLY ESTABLISHED COCA PLANTATION

Item	Quantity	Value (\$US)
<u>COSTS:</u>		
Herbicide		
Material (\$US)	90	90
Labor (man-days)	3	10
Cultivation (manual)		
Labor (man-days)	36	126
Fertilizer		
Material (\$US)	135	135
Labor (man-days)	3	10
Harvest (2 man-days/carga)		
Labor (man-days)	72	252
Drying (.67 man-day/carga)	24	<u>84</u>
COST SUB-TOTAL		707
<u>INCOME</u>		
Coca Price of \$30/carga		
Gross income		1,080
Net income		373
Coca Price of \$50/carga		
Gross income		1,800
Net income		1,093

Notes:

Labor cost \$US 3.50/day  
Yield (carga/Ha) 36.00  
Weed control based on one manual cultivation and one herbicide application between each harvest.

Economics of Non-Coca Crop Production

The economics of crop production in the Chapare is not well understood. There are two fundamental problems: (1) raw data of questionable quality, and (2) use of an inappropriate crop budget model for the Chapare. These problems tend to distort conclusions concerning the viability of alternative crops and the cropping patterns which should be promoted in the Chapare.

IBTA/Chapare and SDBT collected economic data on various crops presently grown in the Chapare based a series of farmer interviews (Sanchez and Taylor, 1986). These data were analyzed to determine the economic return for each crop. However, the economic analysis was presented from the standpoint of an "investor" rather than the viewpoint of the small farmer. Table 6 summarizes the expected economic return for various Chapare crops using existing technology, based on the analysis by Sanchez and Taylor, but incorporating the following two modifications:

- \* The cost of a farm administrator was eliminated from the crop budgets. In reality the farmer himself is the administrator and his earnings are based on the difference between cost of production and selling price, not a fixed monthly fee.
- \* Interest costs (12%) have been eliminated from the crop budgets. Most farmers do not borrow money and thus do not experience interest cost.

This revision has been made to generate crop budgets more representative of the economic picture seen by the Chapare colonist.

TABLE 6: ECONOMIC RETURN FOR VARIOUS CROPS IN THE CHAPARE USING EXISTING TECHNOLOGY (Source: modified from Sanchez and Taylor, 1986 and IBTA/Chapare, 1986).

Crop	Net Income/Ha (\$ US)	Years Required to Break Even
Annuals:		
Rice	\$ 30/Ha	
Maiz-	-21/Ha	
Frijoles	495/Ha	
Yuca	769/Ha	
Perennials:		
Oranges	1,652/Ha	10 years
Bananas	180/Ha	5 years
Avocado	1,483/Ha	6 years
Coca ( \$80/carga)	2,254/Ha	2 years

Notes: Net income/Ha for perennials is the net income during the break even year. Results were modified by eliminating the cost of interest and farm administration.

A review of Table 6 suggests that there are problems with the basic data used in the analysis. For instance, bananas are shown to earn only \$180/Ha-yr, and had the interest and administrative costs not been removed the analysis would show that bananas would NEVER reach the break-even point. Yet bananas have long been a principal cash crop in the Chapare, directly contradicting the results of the economic analysis. Similarly, the large difference between citrus and banana profitability appears artificial, as does the high profitability of some annual crops such as yuca.

There are also several issues concerning methodology which need to be addressed. As previously mentioned the inclusion of interest and administrative costs can be misleading when the farmer neither pays himself a fixed monthly wage nor pays interest. The large impact of these two items on the cash flow for citrus is shown in Table 7. Interest costs should be included only when credit is involved. Inclusion of 12% interest as an "opportunity cost" similarly appears unreasonable on the near-subsistence level farm.

TABLE 7: CASH FLOW FOR ORANGE PRODUCTION. (Source: adapted from Sanchez and Taylor, 1986)

Year	Cash Flow (US \$) With Interest & Mgt. Costs	Cash Flow (US \$) Without Interest & Mgt. Costs
1	-639	-422
2	-545	-270
3	-605	-265
4	-677	-265
5	-759	-265
6	-850	-265
7	-952	-265
8	-1066	-265
9	-247	-697
10	665	1652
11	1667	2586
12	1819	2537
13	2004	2503
14	2245	2503
Cumulative	\$ 2060	\$10,196

The economic analysis also does not adopt a "farming system" approach. For example, annuals are generally interplanted with perennials during the establishment phase. This reduces the weeding cost allocated to the perennial crop thereby reducing establishment costs below those shown in the economic analysis.

In the production of crops such as rice which can substitute for purchased commodities, the portion of the crop which is consumed will have a higher economic value than the wholesale price; its true value will be the retail purchases for which it serves as a substitute.

Finally, a colonist may still cultivate an "uneconomical" crop when his family can provide labor at a cost below the going wage rate. Employment is not always available in the Chapare (in the absence of coca production) or elsewhere in Bolivia, and employment at a low wage may be preferable to no employment at all.

There is a need to re-evaluate both the data and methodology used in crop budget analysis. Cost and yield data from Promoters farms and UPDs should be used to refine the economic data. If the economic analysis does not reflect the colonist's true basis for his cropping decisions, it will contribute little to the understanding of existing and potential small farm cropping strategies.

PROJECT STRATEGY

Development Scenarios to Consider

Three basic questions need to be considered when analyzing the future direction that the Chapare Regional Development Project should take.

- (1) How long and successful can the current coca repression be expected to be?

Previous control efforts in the Chapare have had little impact on the production of coca leaf; control operations were ineffective and short-lived. Coca producers waited for the operation to terminate and then resumed normal activities. This intermittent control effort conditioned the Chapare to maintain existing coca fields and continue new plantings, while waiting for repression activities to wind down.

The current repression effort underway since mid-July 1986 in the Beni region, has severely curtailed the demand for coca leaf and driven the price down to levels that make production, at best, only marginally economic. No other repression or control activity has lasted so long nor affected the Chapare coca grower so dramatically. While some Chapare farmers visited consider this repression just a repeat of past control efforts and look forward to renewed markets, others feel that the "coca boom" is over and are interested in new crops to offset the loss of coca income. The key issue is the extent and success of the present control effort. Incomes in the Chapare have already been severely diminished and the local interest in non-coca crops is increasing rapidly. If the current repression lasts for six months or more, incomes will have reached such a low level that Chapare farmers will be desperately seeking new varieties, and not only to supplement their income but also to feed their families. This situation is the one envisioned in the Project Paper and is the most favorable scenario for implementing the development components of the Chapare Regional Development Project.

- (2) What are the prospects for introducing alternative crops or cropping systems that are ecologically suited to lowland Chapare, produce sustainable yields with low levels of technology and management, and generate family incomes greater than traditional subsistence levels?

Coca leaf is by far the most profitable crop in the Chapare; all other crops have been grown for home consumption or have not received the necessary managerial attention to produce a quality product for distant markets. If the coca repression continues, alternative crops, new varieties, and new technologies will become increasingly attractive to coca farmers who have little desire or opportunity to migrate. Alternate crops (i.e., cacao, coffee, pineapple, oranges), although not as easily marketed or as profitable as coca, will be rapidly incorporated on small farms. This situation does not assume that coca plants will be pulled up and replaced with alternative crops. Rather new crops will be inter-planted with young coca or planted as a monoculture on newly cleared lands. Coca plantings in the Chapare will not be voluntarily destroyed. they will be abandoned and overtaken by natural forest second growth. Most Chapare farmers can only cultivate about 2-3 hectares per family including coca and subsistence crops. Given that most farms are between 10-20 hectares in size, there is considerable room for expansion of alternative crops without disturbing established plantings of coca or other perennials.

- (3) Are there better ways and other less conflictive areas where developmental activities might be more successfully financed?

The agricultural potential of the Chapare is limited due to the wet climate and nutrient-leached soils, particularly in the extremely wet area at the base of the Andean slopes. Climate and soils are much more favorable for agricultural development in northern section of the Chapare, but road access is limited. Due to continuing colonization pressure roads are extended further into unsettled areas, not always suitable for sustained agricultural production. The settlement of the Andean slopes and the Amazon lowlands is a consequence of minifundia, low productivity of sierra farms and, expanding population. One alternative to the continued development of the Chapare is to improve the agricultural production of the Cochabamba valleys and highlands to stabilize the rural populations and reduce the need to migrate. Improvement of forages, livestock, small grains, vegetables, and irrigation are activities that might be encouraged.

At present the agricultural potential of the Cochabamba Valley in particular is actually declining due to problems of reservoir sedimentation, salinization and waterlogging of soils. MACA irrigation engineers estimate that about 1/3 of the irrigated soils in the Cochabamba area are already impaired by these problems, and the situation is continuing to deteriorate. This is one obvious factor which encourages migration from Cochabamba into the nearby Chapare. It may be desirable to utilize a portion of the Project funds to improve production systems in the valleys and highlands, while continuing appropriate agricultural extension and research efforts in the Chapare.

The following four scenarios are offered to assist the mission in determining current and future development priorities and policy in the Chapare and alternative surrounding regions.

Scenario 1: Coca production continues and Project continues. If coca control is not effective and the Chapare Project continues, few accomplishments can be expected. Agricultural credit will fail because farmers will have little interest in producing the products needed to supply these industries. Although research and extension activities will develop crops and technologies suitable for the Chapare, most farmers will have little incentive to implement these packages.

Scenario 2: Coca production continues but without Project. Not much difference from the actual present situation with the exception that the agricultural extension and research will not have the opportunity to reach non-coca growers with alternative adaptive technologies.

Scenario 3: Coca production repressed and Project continues. This is the ideal situation in which the organization/planning efforts of the SDMT/IBTA/EI teams of the past two years could be put into practice. The Chapare farmers would be eager for cropping alternatives and technical assistance. Agricultural credit could be tested for annuals as well as perennials. Selected agroindustrial activities could be attractive for investors and farmers.

Scenario 4: Coca production repressed but without Project. Without a development project and no coca the Chapare farmer would continue at subsistence levels. Limited migration out of the area may occur. Private investors would not be encouraged to invest in the region and agroindustrial development would be far less likely to occur. USAID development investment could be focussed on improving agricultural production in valleys and highlands with more dramatic results.

#### What To Do Next

The future of USAID development activities in the Chapare depends on the success of the coca control program. USAID should monitor the situation closely for the next six months utilizing this period to prepare for full implementation should coca control efforts be successful, yet postponing major expenditures (ie major credit programs) until the long-term effectiveness of coca control becomes more clear.

Specifically USAID should:

1. Continue extension efforts at current levels.
2. Prepare credit plans for farmers and agroindustry, but do not execute the final loan documents. The only exception would be pilot-scale credit activities in areas with minimum coca production.

3. Eliminate research at the Chipiri Station, refocusing crop research toward UPD's. Research on large animals (buffalo and cattle) and forage should be terminated. Otherwise continue research at existing levels but give increasing emphasis to perennial crops and farming systems.
4. Explore development opportunities in the Cochabamba valley or elsewhere which could help reduce migration pressure into the Chapare. The unused US\$3-5 million originally designated for large scale agroindustry could be utilized to fund select projects to improve agricultural productivity and community infrastructure. A preliminary survey should be conducted as soon as possible to identify potential projects and funding levels.

Decolonization of the Chapare using incentives to destroy coca plantings and return to the valley or highlands should not be considered as an alternative. We can foresee many potential pitfalls in this approach, not the least of which is the problem of compliance monitoring after the reverse-migration incentives have been granted.

#### Recommended Long-term Strategy

After a period of approximately six months, or when the success or failure of coca control efforts become clear, USAID should implement the appropriate recommended strategy.

1. If coca traffic resumes on a large scale with little prospects for renewed suppression, USAID funding for the Chapare should be suspended indefinitely. Redirect Chapare Project funds to productivity enhancement and infrastructure projects in Cochabamba or other areas to help reduce migration pressure into the Chapare. No credit activities should be undertaken in the Chapare, aside from maintenance of the previously-mentioned pilot credit program in an area of minimal coca production.
2. If coca growers legally retain 2 hectares or a newly decided limit for coca, USAID assistance should be limited to agricultural/forestry research and modest extension activity. A cautious approach to agricultural credit and agroindustrial promotion should be taken.
3. If prospects are good for continued coca suppression, USAID assistance should be accelerated to the level which farmers can usefully accept. Actively promote credit and agroindustry activities.

## ANALYSIS OF PROJECT COMPONENTS

### AGROINDUSTRIAL DEVELOPMENT

#### 1. Present Strategy and Project Design

The Chapare Project establishes agribusiness as a principal component, the objective being to exert a strong "demand-pull" to foster the production of agricultural commodities as raw material. Specifically, the Project Paper strategy envisaged early establishment of four large scale agroindustrial projects (investments of \$600,000 upward) and at least 10 small scale operations (averaging under \$20,000). These were to be private sector operations, assisted by USAID project funds channelled through intermediate credit institutions.

#### 2. Present Status of Large Agribusiness Projects.

After feasibility studies, the four large agroindustries selected for development were particle board, fruit processing, swine fattening, and kudzu dehydration. Among those discarded were plywood, cattle fattening, meat processing, yuca flour, wood pulp and ceramics.

a. Particle board. Founded in 1978, the Industrial Maderera de Prensaje y Afinos S.A. (IMPA) in Cochabamba ran into a series of financial problems holding back completion of its factory. In 1984-85 the Central Bank provided funds enabling completion, with the requirement that raw material sources be re-directed to qualify for USAID financing as an agroindustrial participant in the Chapare Project.

IMPA agreed to source the particle board plant with wood from land clearing in Chapare, to the maximum extent possible. All of this wood is second growth (chume) with wide dispersion in species, diameters, densities, and suitability for processing. At present it is burned or left to rot, possibly with some advantage in curtailing deterioration of the prevailing poor soils.

The feasibility study indicates an ample potential market in Bolivia for particle board (Von Borries, 1984). However to compete successfully for market share particle board must be priced lower than solid wood and plywood. The factory is extremely elaborate and costly for its planned production of only 42 m<sup>3</sup> daily. Most particle board utilizes waste materials from forest product operations. Raw material from the Chapare is an unproved source. Trees from land clearing must be selected for species, densities, and diameters; moved from small clearings to collection points, and transported an average of 120 km. to Cochabamba. Additionally there is a high raw material cost for imported adhesive as the binder, usually constituting 1/2 to 2/3 of total raw material costs in the finished product.

IMPA is aware that sourcing the plant from Chapare land clearing may be either insufficient or too costly, or both. Alternatives are harvesting wood from second growth land which IMPA holds in the Chapare and using waste from Cochabamba area sawmills.

IMPA is a Cochabamba industry whose purchase of Chapare raw materials is unlikely to have an important impact on the Chapare region. There is no certainty that large volumes of wood will be provided by small farmers. The plant might provide some incentive for Chapare growers to plant solid blocks of fast-growing species. However, because the finished particle board must enter the market as a low priced product, and because raw material costs for the adhesive binder are high, returns to the farmers must inevitably be small.

b. Fruit processing. Perennial crops are considered the best sustainable use of Chapare soils. There exists a substantial base in citrus which can be expanded, and prospects are good for adding other tropical fruits suitable for juice extraction and products manufactured from fruit. Feasibility studies indicate growing domestic markets and opportunities for export to neighbouring countries.

At this time Chapare has neither the assured production of quality citrus nor the infrastructure to support a processing plant. Thus agroindustrial proposals in this area contemplate the provision of financial incentives to Cochabamba processors to stimulate their purchase of fruit from the Chapare.

Negotiations with several entities resulted in an agreement within which Industrias Alimentarias del Valle, a regional processor of fruit in Cochabamba, agrees to increase its purchases of citrus and eventually other fruits in Chapare, and enlarge its plant utilizing Chapare Project loan funds. If feasible, the company will acquire small mobile units for concentrating juices and fruit pulps within Chapare, reducing costs for transporting to the distant Cochabamba plant.

The Del Valle factory is small, conservatively managed, with minimal machinery and investment for its present output. Its products are good quality and well accepted in a steadily growing market. It appears well suited to grow and to provide a market for expanding raw material supplies.

If and when the Del Valle arrangement is concluded the immediate impact on Chapare will be small. Existing citrus in the region is poor in quality and low in price. The principal advantage of the project is that it provides incentive for improvement and for greater planting of both citrus and tropical fruits, and may stimulate the processing of other products such as palm heart.

c. Hog fattening. This project contemplates establishment in Chapare of an agribusiness breeding and fattening high quality hogs, selling weaned pigs and commercial feeds to farmers, providing technical assistance and medicines, and re-purchasing fattened hogs from farmers for sale to processing plants in Cochabamba.

There is already a commitment, not yet implemented, in which project funds would be loaned through intermediary banks to expand substantially the operations of Agropecuaria Copacabana (AC), a

well-managed enterprise now breeding, fattening, and marketing hogs in Cochabamba with a smaller auxiliary operation in Chapare. AC proposes to enlarge greatly the Chapare facilities to produce high-quality pigs there, both for its own account and for sale in lots of 10 to small farmers. Technical assistance, balanced feeds, and veterinary support would be available from AC, and the company would re-purchase the fattened hogs.

Better quality hogs in Chapare are clearly desirable and have a potential for contributing significantly to farm incomes. However, the project in its present form has many problems. The year-round wet climate, risk of disease, unstable farming systems, long haul of commercial feeds into the area, high capital investment, and inadequate small farm facilities make it a high-risk investment for project funds. Intermediary banks so far have refused to provide the guarantee which AID requires, preventing implementation of the AID approved plan.

In Chapare, improvement of hog quality and numbers does not necessarily require the establishment of a large commercial feeding operation. These objectives could be largely achieved by establishing breeding facilities providing better quality hogs in the area, coupled with technical assistance and veterinary services. This might be achieved through project support of a modest increase in AC's Chapare operation. The emphasis would be on conventional livestock improvement rather than the immediate establishment of a commercial fattening operation.

The immediate impact of a hog improvement program on farm incomes would be small but the base would be laid for significant income contributions in future years.

d. Kudzu and Banana Dehydration. These are two of the most easily grown Chapare crops. Possibilities were explored for establishing an agroindustry drying kudzu for hay, pellets, and flour, and banana for chips and flour, all to be marketed in the Cochabamba area as livestock and poultry feed. After analysis of capital costs for equipment and the rather narrow market which exists, the project was judged not viable and was dropped. There is little prospect for greater viability in future years.

### 3. Small and Medium-Scale Agribusiness

AID loan funds are available in the Chapare Project to assist the Regional Development Corporation of Cochabamba (CORDECO) and other entities in developing small scale agroindustry within the region. To date activity has been restricted to research and limited pre-feasibility studies sponsored by CORDECO and prepared by local university personnel. Principal targets so far are lemon oil and menthol along with other minor and specialized crops.

The CORDECO-university projects are not likely to have an important impact overall on Chapare income. However it would be useful to establish a few specialized operations within the area, helping to diversify income sources and farm management patterns. Equally important is the building

of an institutional capacity for research in Chapare products. Project support can improve laboratory facilities and provide better access to research results on similar products elsewhere in the world.

An area of greater potential importance is project support for small and medium-scale industries handling crops which necessarily require some processing promptly after harvest. Such assistance is now being considered for a tea-growing cooperative, an operation in which CORDECO has a substantial interest. To the extent that coffee and cacao become important crops, processing and marketing facilities for them will similarly become necessary. This will also create a demand for crates needed for harvest and shipping.

Because of special circumstances there exists a medium-scale agroindustrial possibility for cattle slaughter and an ice plant in Puerto Villarroel. Originally planned as a large-scale project, feasibility studies indicated a too limited and uncertain cattle supply and excessively long hauls of refrigerated meat to Cochabamba. However a private investor did construct a plant in Puerto Villarroel, which because of its owner's death never operated. The existing ice plant could possibly operate on a small scale to improve meat supply within Chapare and to promote commercial fishing. Currently the situation is being reviewed by an intermediary bank. If the bank is willing to guarantee project credit, such assistance could suitably be considered within the limitations of a medium-scale agribusiness.

#### 4. Credit for Agribusiness

Credit policy established by AID requires the intermediary lending institution to accept responsibility and provide a guarantee covering the loan. This requirement is a major obstacle to agribusiness loans in the high-risk Chapare region. It would be useful to have the capacity to accept partial guarantees when the purpose of the loan is to stimulate crop and livestock production.

There is little experience with procedures for finalizing and disbursing loans. Procedures for handling eligibility requirements and loan applications require joint action and approval by AID and SDTB. However, the paucity of loan applications so far causes each one to be handled, individually. To date AID has played the chief role, in part because of inadequate SDTB staffing. SDTB claims that one of the largest loan applications, by the IMPA particle board plant, reached the stage of AID commitment before SDTB had an opportunity to present its views.

#### 5. Agribusiness Coordination With Farmers and Institutions

Experience to date is inadequate to permit evaluation. It is expected that agroindustry proposals will be structured on contracts for purchase of commodities between the industry and the cooperatives or communal groups. However, the hog fattening proposal contemplates contracts directly between the industry and the individual farmers.

## 6. SDBT and CORDECO

CORDECO, a regional development agency for the Cochabamba region, is a marginal participant in the Chapare project. Its present interest centers on its existing investment in the tea-producing cooperative and on channelling project funds into university research on Chapare products which have potential for small agroindustry.

SDBT and CORDECO, both located in Cochabamba, appear to maintain contacts adequate to the very small requirements imposed by their joint participation in the existing activities. Neither agency has been staffed adequately for work in agroindustry. Up to now their roles have been minor. Identification, development and evaluation of agribusiness has been done principally by AID.

## 7. Marketing and Information Services

Chapare strategy includes the establishment of marketing services and an information clearing house. No significant progress has been made toward these goals. Market analysis to date is to be found only in feasibility studies relating to large agroindustry. There is no systematic effort to explore and report the performance of Chapare goods in the market, an area far more important to farmers today than agroindustry.

Data on seasonal price fluctuations is critically important for planning production and marketing strategies. The most urgent need is a periodic market letter directed to Chapare extension agents, promoters, experiment station personnel, cooperatives, community groups, and other interested persons. It would provide current information market volume and prices, and an updating on events of importance to Chapare Development such as communal projects, roads, etc. It is understood that SDBT is now expanding its economic analysis capability within which it will be possible to place the market services entity. A single individual should be adequate to prepare the market newsletter.

The project paper does not indicate what is meant by an "Information Clearing House". Possibly this means an entity keeping all participants informed as to what is going on. If so, this concept can be combined with market services rather than standing alone as a separate function.

## AGRICULTURAL CREDIT

### Overview of Formal Agricultural Credit in the Chapare.

Only the Bank of Cochabamba (BC) has made CP farm loans to date. As of August 12, 1986 BC had granted 21 loans with a total dollar value at time of lending of about US\$173,000. The average size of loans was about \$8,300. Most of the loans carried a term of 3-5 years and the largest loan was for US\$20,000. All of these loans were made and administered by the Cochabamba office of BC, and all were secured by mortgages on property outside of the Chapare worth at least twice the value of the loans. In addition, the BC branch located in Villa Tunari has been making about 40 small short-term loans for 60 days or less, mainly to local merchants and traders, from about US\$40,000 of local deposits.

It appears that few loans are made by other commercial banks to farmers working in the Chapare. Plans are for the new branch of the BIG Beni Bank in Puerto Villarroel to extend loans during the next year to a total amount of US\$200-300,000 mainly to its current customers who do business in the area.

The Banco Agrícola (BAB) in Villa Tunari made no new loans during 1986 because of the lack of funds. There is only one person working out of this branch and he is mainly collecting loans. In 1985 this branch made only 68 loans, mostly to farmers, worth a total of about US\$50,000. These monies came from the Central Bank.

Two of the three credit and savings cooperatives in the Chapare affiliated with FENACRE have had no significant financial transactions for several years and are essentially dead. The third cooperative, in Mariposa (Pinal), still has 80-90 active members and administers their own small loan fund worth about US\$2,000. FENACRE has had only modest contact with these cooperatives for several years.

The only other source of formal loans for farmers in the Chapare is the Cooperativa Multiactiva Tropico de Cochabamba (CMTC), a multipurpose cooperative formed in November 1984 and closely associated with several farmer federations in the Chapare. The cooperative has about 18,000 members who have paid approximately US\$50 each to join. Part of this money has been used to provide loans to members of the cooperative. Steve Wiles, in his final report to USAID/Bolivia dated May, 1986, reported that in early 1986 the cooperative had about 240 agricultural loans to members outstanding, worth a total of about US\$400,000. These loans were made over 1984-86. Most of them were given in-kind for goods purchased through the cooperative.

It was not possible to update these figures with leaders of the Cooperative in Cochabamba. The manager of the cooperative had recently quit or been fired and the accounts were somewhere between lost and Alice in Wonderland. The cooperative's leaders were not able to give clear

answers on whether or not the cooperative would be continuing to offer loans to their members out of their own funds. As an aside, the cooperative asked the BC for a US\$20,000 loan under the CP project several months ago. This loan is in limbo, probably because the manager of the cooperative left.

While difficult to give an exact figure, it appears that formal loans to farmers in the Chapare will total less than US\$300,000 in 1986, and that fewer than 200 farmers will have access to these loans. CP funding will account for about half of this value and about 1/10th of the borrowers. For comparative purpose, the Villa Tunari branch of the BAB alone, several years ago, was making loans to more farmers for a total value in excess of US\$500,000 annually.

When compared to the number of farmers in the Chapare region and the overall level of economic activity there, formal financial market activity is insignificant. Only a miniscule fraction of the farmers in the region have access to either formal loans or deposit accounts. The amount of formal loans is only a very small fraction of the US\$50-100 million in gross income realized by the farmers in the region each year from the production of coca alone. The Chapare has one of the lowest ratios of formal-financial-activity to gross-value-output of any major economic region in the world.

#### Limitations on Financial Intermediation in the Chapare

There are powerful reasons why formal financial intermediation in the Chapare has not expanded with the CP. In fact, there is less intermediation there now than 4-5 years ago, despite the tremendous increase in real incomes in the area—increases due largely to expanded coca production. The overwhelming reason for this contraction of the formal financial system has been hyper-inflation and associated monetary policies. This has resulted in a shrinkage of the entire system in real terms, to less than 1/10th of its size in the early 1980's. Formal lending in the Chapare has shrunk accordingly, despite CP-sponsored lending.

The value of deposits declined precipitously during hyper-inflation. Understandably, depositors have been slow to return their savings to deposit accounts, even though recent rates of interest on savings accounts are positive in real terms. This is especially true in the Chapare where, over the past several years, individuals with savings found coca investment an attractive alternative. This has meant that financial intermediaries had a sharply reduced pool of deposit funds from which to lend. An illustration of this is the branch of the Bank of Cochabamba in Villa Tunari that had active deposit accounts worth more than US\$2 million in the early 1980's, but now has about US\$40,000 in about a thousand stagnant deposit accounts. The savings and loan cooperatives in the region have been even more adversely affected by this process.

Financial intermediation in the Chapare is further limited by the lack of formal financial infrastructure in the region. Only two bank branches currently exist (Bank of Cochabamba and the Agricultural Bank), both in Villa Tunari, and neither is very active in making loans. The credit and savings cooperatives in the region have been destroyed by three years of inflation. While the new branch of the BIG Beni Bank in Puerto Villarroel will add to the banking infrastructure, most farmers in the Chapare who want to use a formal financial facility will still have to go a long way to do so. The aura of drug stained money has also discouraged some banks from becoming more active in the area.

In addition, banks are slow to lend to farmers in the Chapare due to provisional land titles that do not provide secure collateral for lenders. Further, many of the farmers in the Chapare came there as part of a land settlement program that had important social and political objectives. It would be awkward for lenders to seize land in case of loan default, even if titles were good collateral, because of this historical background. Again, the lenders insistence on a good deal of collateral for CP loans is a symptom of severe credit rationing. Leaders are likely to become less concerned about collateral as the size of the financial system is increased.

In summary, the tiny amount of formal credit extended in the Chapare has resulted from the severe contraction in lendable funds in Bolivia's financial system, the feeling by bankers that they can make more money lending their money elsewhere, and the tremendous growth in the amount of liquidity in hands of producers and traders in the Chapare because of the coca business. Many of these entrepreneurs haven't needed formal loans for their activities. Furthermore, USAID has not been very excited about disbursing loans in Chapare because credit funds could have been diverted to coca production.

#### Design of CP Agricultural Credit Activities

As is the case in many rural development efforts, designers of the CP assumed that a substantial increase in the number and real volume of formal agricultural loans would be critical inputs necessary to encourage farmers to expand non-coca activities. Unlike many other agricultural credit programs, however, it was not assumed that concessionary rates of interest on loans were necessary to subsidize farmers to make changes. It was also assumed that many farmers in the Chapare would need medium- and long-term loans to clear land, implement new technologies, purchase livestock and to plant new perennial crops. The project designers also assumed that IBTA technicians would supervise new technology adoption by borrowers and also provide information useful in loan approval.

Regarding participating financial intermediaries, it was assumed that commercial banks and cooperatives associated with FENACRE would handle most of the agricultural loans in the Chapare. Funds for loans would be largely supplied by PL 480 counterpart. An amount of nearly US \$7 million was initially targeted for this purpose. It was also initially assumed that a lender spread of 4% would be sufficient to cover the costs of lending in the Chapare and also be sufficient incentive to stimulate intermediate credit institutions (ICI's) to make agricultural loans there. A loan-recovery- loan-risk-sharing arrangement was recently introduced to increase the incentives for ICI's to make farm loans in the Chapare.

In retrospect, it appears that at least 5 design weaknesses exist in the credit activities of the CP. (1) The project designers overemphasized the role that loans can play in inducing technological change at the farm level. Some of the IBTA/Chapare technicians continue to think that little or no diversification of coca production will occur without substantial amounts of loans to lead the process. Loans, whether dear or cheap, are weak instruments for prodding farmers to make changes, especially if these changes are not in the best interest of the borrower. (2) The designers of the project substantially overestimated the amount of agricultural loans that could be efficiently used within the CP. (3) It was a mistake to exclude the Agricultural Bank of Bolivia from participating in these credit efforts. (4) Too much emphasis was given to medium-and long-run credit, and too little emphasis given to short-term loans. And, (5) too little incentive for banks to extend loans in the Chapare were included in the original design of the project.

#### Effectiveness of the Credit Delivery System

It doesn't take much time to evaluate the effectiveness of the formal credit delivery system in the Chapare. For all practical purposes there is none. Only two commercial banks have showed interest in the area, the credit unions are essentially dead, the BAB is excluded by USAID from participating in CP lending, and the large multipurpose cooperative, CMIC, appears to be an unreliable source of financing. The BC is the only bank that is extending any loans under the CP. BC's efforts are token at best and the Bank appears to have little interest in expanding its activities in the project area. BIG Beni Bank will probably also be slow in extending substantial amounts of CP loans in its new branch. The financial infrastructure to support the CP activities is yet to be built.

#### Credit Procedures

As far as could be determined, the BC was carefully following the lending procedures set forth by CP, USAID, and PL 480. The bank appears to be extending loans to those who are eligible under CP credit requirements. BC had well managed files on all of the 21 CP loans approved to date. The justifications and plans given for the use of the loans were all for non-coca production. Only two of the borrowers

reported having more than 20 hectares of land in the Chapare: one had 50 hectares and the other about 30 hectares. Although unsubstantiated, it is suspected that a majority of these CP borrowers live in the city of Cochabamba most of the time. Only individuals who lived relatively close to Cochabamba could afford to jump all of the hurdles that the BC placed in the way of potential CP borrowers.

#### Loan Timing and Transaction Costs

The BC is making loans under the CP grudgingly. An average loan takes 4-8 weeks to complete. The Bank exhibits all of the classic characteristics of an intermediary that is severely rationing loans. They are forcing borrowers to come to the Cochabamba office to do all of the negotiating of the loans, and making little use of the branch office in Villa Tunari. They are also very conservative in their collateral requirements and impose substantial transaction costs on borrowers attempting to get these loans. The typical individual who obtains a loan under the BC/CP must visit the bank 3-5 times, in addition to obtaining certification or letters from several other offices. All of this results in total borrowing costs that are substantially more than the real interest charges and commissions (2%+1% per month) that are officially levied on CP loans. Individuals who are full-time farmers and live in the Chapare are essentially rationed out of access to CP loans by these procedures. Since the borrower's loan transaction costs tend to be fixed, this imposes an especially heavy burden on those who might want to borrow only a relatively small amount. It is doubtful that the recent changes in CP loan arrangements, which spreads some of BC's loan recovery risk, will be sufficient to induce them to become much more aggressive in their Chapare lending. Other types of lending are just too attractive.

#### Impact of Credit

Because so few of the economic actors in the Chapare have been recently touched by formal loans, it is unlikely that the CP agricultural credit efforts have had any perceptible impact on coca diversification activities. Again, formal loans have been a tiny fraction of the value of total economic activities in the Chapare. Most of the farmers in the Chapare grow at least some coca, and a few farmers have up to 10 hectares, well in excess of the two hectares allowed by law. In this context it is useful to speculate on what the 21 borrowers from the BC did with the additional liquidity provided by the CP loans.

Certainly, all of the CP borrowers have the opportunity and land resources to produce coca. Many of the CP loans were justified on the basis of purchasing equipment and labor, most of which could be used to clear land. Most BC loan applications, for example, showed that the borrower planned to buy at least one chain saw, a prime tool for land clearing. All loan applications listed an expansion in some non-coca enterprise as a justification for the loan. We don't know what the borrowers would have done without the loan, or what they in fact did at the margin with the additional liquidity supplied by the CP loans. However, it appears reasonably certain that, with or without loans, borrowers allocate their liquidity in a way that maximizes their expected incomes.

The agro-economic data available from IBTA strongly suggest that coca production has been far and away the most profitable enterprise available to most Chapare farmers. Unless the CP/BC borrowers had a moral aversion to coca, it is possible that some of the additional liquidity provided by the loans did, or will, result in the additional coca production. Dropping money out of an airplane over the region, providing more loans to other market intermediaries such as truckers, or augmenting the amount of liquidity available in the region in other ways will all likely have the same results. Only a substantial and sustained drop in the price of coca will induce farmers to direct marginal liquidity mostly to non-coca activities. IBTA does not have any dependable package of inputs-products that will compete with coca as long as there is a strong illicit market. In the absence of coca control, farmers may be induced to diversify only slightly their production through IBTA's efforts.

### Conclusions

(1) The agricultural credit activities under the CP have been too small to make any significant difference in the region. The recent tremendous shrinkage in the financial system, ample amounts of liquidity in the Chapare, small margins on CP loans to farmers, and bankers' uncertainties about the opportunities for formal financial activities have sharply limited both the supply and demand for loans there.

(2) There is almost no mobilization of savings in the Chapare by financial institutions and there is now substantially less formal financial intermediation in the region than 4-5 years ago.

(3) As long as the production of coca is the most profitable activity in the area, it is likely that at least some of the liquidity provided by formal loans will leak into additional coca production, even with the tightest controls. In contrast, if the price of coca remains low, some of the rural liquidity generated by coca income may flow into other activities.

(4) While farmers may be willing to slightly diversify their economic activities away from coca toward activities developed by IBTA, only a sharp and sustained drop in both the price of coca and local labor costs will make other crops and enterprises attractive. Only then will farmers be interested in diversifying their production. However, lower labor costs will also reduce the variable cost of coca production. Farmers in the Chapare already have large amounts of land planted to coca. As long as the price of coca will cover their variable costs of production, which is largely labor, much of this land will probably stay in coca.

(5) In the crop year 1986-87 it is doubtful if BC, FENACRE, and BIG Beni can lend carefully and cheerfully a total of US\$1 million under the CP. The amount could well be less than half of this. These amounts might be doubled if the BAB were allowed to participate in the program.

(6) A margin of 4% on CP loans, even with some sharing of the loan recovery risk, does not give lenders sufficient incentive to aggressively lend to small farmers in the Chapare. Further, it is unlikely the commercial banks will use much of their own funds for lending in the Chapare until there is a major expansion in the amount of liquidity in the overall banking system. As long as this shortage of funds exists, commercial banks will continue to severely ration loans to new customers, small borrowers, and those with weak collateral. Part of this rationing process will entail off-loading of additional loan transaction costs on non-preferred borrowers. However, the provision of USAID credit funds on attractive terms to private banks may alleviate this problem.

(7) Most farmers in the Chapare will not have significant access to formal loans until banks and credit unions located in the region begin to make agricultural loans. Reactivating the branch of the BAB in Villa Tunari and allowing it to participate in the CP would be an important step toward giving more farmers in the Chapare access to formal loans.

(8) Under the best of circumstances an expanded and efficiently functioning financial system will have little direct effect on coca production or enterprise diversification. The price of coca along with the price and yields of alternative economic activities will be the main determinants of farmers' production decisions.

(9) The CP has placed too much emphasis on the need for loans to help speed production diversification, and too little emphasis on the need to build financial infrastructure in the Chapare that is accessible, efficient, and reliable.

(10) Many of the technicians associated with CP, especially extension agents, incorrectly feel that farmers will not adopt new crops and techniques without loans. Clearly, farmers are able and willing to try new things if they expect them to be profitable: witness the tremendous increase in coca production virtually without the assistance of formal loans. Availability of loans can help speed the technological change process, but it does not lead the charge.

(11) CP technicians are likewise placing too much emphasis on the need for medium- and long-term credit to assist in planting tree crops. However, the hardest thing a financial market is asked to do is extend long-term loans to farmers in areas where land titles are not clear and under inflationary conditions. If this constitutes a credit bottleneck, carefully examine the potential to use short-term credit (1 year) as a partial substitute for a longer-term loan.

### Recommendations

(1) The credit activities in the CP should be refocused from mainly dispensing loans to concentrating on strengthening financial infrastructure in the Chapare. This should include deposit as well and credit services. Technical assistance should be focused on helping to reconstruct the credit unions in the area, helping to reactivate the branch of the BAB, and helping branches of private commercial banks in the area improve their operations. This should include reduction of borrower and depositor transaction costs.

(2) As quickly as possible the BC should be encouraged to transfer its lending decisions for CP loans to its branch in Villa Tunari. USAID might be forced to open the spread on loans made at branch offices to encourage this shift. Placing more emphasis on short-term loans should also make it easier for bank branches and credit unions in the Chapare to become involved in CP lending.

(3) Until inflation rates decline substantially, lenders in the Chapare should be encouraged to concentrate largely on short-term loans.

(4) In the next two years financial intermediaries in the Chapare should be encouraged to become more aggressive and innovative in mobilizing deposits. The CP may want to underwrite the costs of some of these efforts.

(5) USAID-PL480 should scale down their plans for lending US\$7-8 million through ICIs in the Chapare. At most, a target of about US\$2 million through ICIs in mostly short-term loans in 1987-88 appears to be more realistic. This assumes that coca production will decline in importance in the region and that financial intermediaries will be strengthened and will also be lending funds of their own in the region.

(6) If intermediaries are still hesitant to lend significant amounts of money in the Chapare with the new arrangements for sharing of loan recovery risk, USAID-PL480 may want to consider increasing the spread on CP agricultural loans from 4% to 6%. This might be done in conjunction with encouraging the banks to shift their loan-making decisions into the Chapare. The key point to keep in mind here is that "outside money" should not be made so cheap that it weakens the incentives of the banks to be aggressive about savings mobilization.

### Need for Improved Financial Markets in Bolivia

USAID/B has a large number of projects in its portfolio that, like the Chapare Project, include loan targeting. This targeting is seldom effective in achieving the overall objectives of development projects because of fungibility, the essential characteristic of all financial instruments. All too often loan targeting gives the designers of the project a false sense of control, ends up introducing more friction into financial markets and makes them work less efficiently and equitably, and diverts policymakers and donor employees from the important task of

improving the performance of financial markets. The opportunity cost of a fragmented and misplaced effort in targeted credit, is that the Mission does not develop a more direct approach to treat the core problem: improving the performance of the financial system in rural areas.

The recent formation of a group in the Mission focusing on rural finance problems is certainly a step in the right direction. Likewise, the new assessment of the financial system in Bolivia and the add-on one of the ongoing projects for workshops, etc. in rural finance are also useful steps. It is especially pleasing to see the Mission stay in touch with the World Bank on its new initiatives in rural finance.

The next step for the Mission is to design a new project, closely coordinated with the World Bank and IDB, that will directly address the overall problems of structure and performance of rural financial markets in Bolivia. Because financial markets are so badly fragmented and contracted in the country, AID may get more bang for bucks placed in the financial market project than money spent in many other areas of the economy.

#### EVALUATION OF RESEARCH AND EXTENSION ACTIVITIES

##### Research and Extension Goals

To be effective the research and extension program must produce a lasting impact in the Chapare after project funding ends. Three strategies can be effective:

1.  
Training of promoters and farmers in new techniques which will continue to be used in the future. This training should go beyond the simple transfer of skills, but should also continuously reinforce the idea that the farmers themselves need to innovate; they cannot simply wait for an extension agent to come and tell them what to do. After the project ends it is likely the extension agent will not be available.
2.  
Dissemination of publications for use as reference materials by interested farmers after the project has ended.
3.  
Introduction of improved and non-traditional genetic material

Extension and research activities have been evaluated with respect to this goal of promoting these long-term changes in production practices.

### Revised Extension Strategy

The PP envisioned that extension activity would focus on 10-20 Ha. Demonstration farms, of which 140 were to be established during the project, 20 in each of 7 micro-regions at the rate of 28 per year. It was expected that the extension agents would develop a plan for each demonstration farm and the farmer would implement this plan under the direction of the extension agent. The project would provide inputs as an incentive.

Early in the project it was found that it would not be feasible to implement demonstration farms:

- \* Coca was the principal cash crop on perhaps 99% of the Chapare farms. In the absence of effective coca control measures, coca would be the principal cash crop on the demonstration farms.
- \* IBTA did not have previous contact with the farmers. The farmers were not disposed to trust the recommendations of an unproven government agency, particularly in view of the perceived linkage to coca control and previous unfavorable experiences with PRODES.
- \* Most IBTA extensionists lacked prior experience in the Chapare and had not yet acquired the local agronomic experience needed to manage farm-size units.

No rational Chapare farmer could be expected to destroy his coca to plant alternative crops, particularly when the technological package was unproven and the marketability uncertain.

During the first months of project implementation, an alternative extension approach was developed for the Chapare. In simplified form it includes the following steps:

1. A presentation to the community explaining the objectives and benefits of the extension program. These presentations are typically organized through the farmer "sindicatos".
2. Following the presentation the community decides whether or not to request IBTA extension services.
3. In response to a request from the community. IBTA begins to provide training and extension services to farmers, selects and trains promoters, and establishes Demonstration Production Units (UPDs).

The UPD is a demonstration plot or on-farm experimental plot (fertilization and variety trials) on the promoter's farm.

These have several purposes including research, training of promoters, and to expose local farmers to new crops and technology.

Due to the lack of effective coca control efforts during the first 1 1/2 years of the project, the original extension strategy was unworkable. The revised strategy appears to work very well and should be continued.

### Extension Activities

In view of the difficult situation created by the lack of vehicles during the first year and lack of coca control until very recently, impressive progress has been made in the provision of extension services. Although the number of farmers interested in working with non-traditional crops has been limited in the past due to the strong market for coca, extensionists have nonetheless been able to gain the confidence of communities, recruiting promoters and beginning to introduce improved agronomic practices. Following the recent collapse of the coca market, requests for extension services and improved genetic material has increased and now exceeds the capacity IBTA/Chapare.

Personnel interviewed predicted that extension services will not be provided in the Chapare region beyond the end of USAID funding for IBTA/Chapare personnel. Following termination of the Project, local promoters will remain as the ONLY agricultural extension agents in the area. This makes it imperative that training of promoters be the primary extension goal. In the long run, it will be the promoters who implement improved techniques on their own farms and assist their neighbors who will be in a position to upgrade agricultural practices in the Chapare. Promoter training should be emphasized. Promoters should be provided a complete set of technical bulletins for their future reference.

The project would benefit greatly from additional extensionists. Every effort should be made to add three more extensionists to IBTA/Chapare staff, bringing the total number to 12. To help close the gap in extensionist capacity, researchers should utilize UPDs for experimentation insofar as practical since this will provide additional contact with promoters and farmers.

It was not possible to observe directly the courses which are offered as part of extension activities. However, a review of course plans suggested that the material was covered in an orderly fashion, and personnel who had attended courses indicated that they were beneficial.

### Research Activities

The overall research objective has been to identify non-traditional crop varieties and agronomic techniques suited to the humid Chapare environment. Research is also being conducted on forage and animal production. Most research has been conducted at the two experiment stations, La Jota and Chipiriri, with additional research and observation trials being conducted on selected UPDs. Even though positive and valuable research results have been obtained, several factors constrain research effectiveness and indicate the need to modify the research strategy.

The two experiment stations are located in wet life zones. The Chipiriri station in particular is located in an extremely humid area having poor soils. This area not only has extremely limited agricultural potential but is also atypical of the Chapare region. As a result, it is difficult to extrapolate experiment station results to the less humid regions of the Chapare which have greater agricultural potential.

There has been a chronic lack of agricultural labor available to run the experiment stations. This situation is so bad that the researchers themselves must perform field labor and labor-intensive trials cannot be undertaken. Recently labor availability has improved since competitive market wages have decreased.

The project duration is inadequate for conducting adequate research on the perennial crops which are felt to hold the most promise for economic exploitation in the Chapare.

The most important aspect of research is dissemination of the results, yet inadequate attention has been given to this problem. For example, researchers indicated that their results will be archived in the agricultural library in La Paz, yet the efficiency of this approach is questionable because the Chapare researchers themselves did not use this library in researching their proposed projects. They also indicated that research results will be published in annual reports and stored in the Experiment Station libraries, yet copies of some previous annual reports are no longer available.

Perhaps even more important is the transfer of research results to farmers in a form that is usable by them. Although promotor training and introduction of new genetic material are the principal mechanisms for technology transfer to promoters and farmers, the preparation and dissemination of simple crop technology bulletins cannot be overlooked. This will be particularly important as a source of reference material when extension services are no longer available.

It is recommended that the research strategy be modified in the following manner:

1. No more research should be conducted at Chipiriri; this site has poor agricultural potential and is atypical of the principal agricultural zones in the Chapare. Instead, the researchers at Chipiriri should redirect their research efforts toward Puerto San Francisco and other drier areas.

An agricultural sub-station should be constructed near Puerto San Francisco as soon as possible to support this redirection of effort.

2. Give more attention to experimentation on UPDs as a means to overcome labor shortages and to obtain experimental results from a wider diversity of soil and climatic conditions than are available at the experiment stations.
3. Give increased attention to the introduction of new genetic material for perennial crops (particularly non-traditional tree crops). Varieties should be selected based on their proven ability to perform in humid zones elsewhere.

Make small plantings at the La Jota station and also distribute planting material to farmers throughout the area with the objective of determining the adaptability to the diverse climatic and soils conditions. Record the location of each planting so that in the future (perhaps 5 years from now) it will be possible to return and determine the adaptability of these varieties.

4. A publication/editorial committee should be established. Also a full time editor should be hired to insure the quality and consistency of the published research and extension reports. Three types of reports are appropriate for three audiences:

Farmer: Short bulletin describing basic crop production techniques. Use diagrams to the greatest extent possible.

Extensionist: Bulletins describing production techniques, varieties, yields, pest control, fertilization, marketing strategies, and other factors to be considered in the management of a particular crop. May also include bulletins on particular agronomic conditions in the Chapare, such as the soils bulletin which has already been published.

Researcher: A research report, oriented for use by other researchers.

All publications should be printed on a standard format and punched for storage in a three-ring binder. Each extensionist and promoter should be given a binder containing all Extension and Farmer publications. The objective is to disseminate this information throughout the Chapare.

### Agroforestry Activities

Although the PP contains a significant agroforestry component, little has been accomplished to date beyond propagation of laurel Gliricidia, and Erythrina in nurseries.

Many of the conditions which prompt agroforestry activities in other areas are absent in the Chapare: there is no lack of firewood, bare areas revegetate rapidly so that tree planting is not needed for erosion control, lumber is abundant, and the natural "chume" regrowth probably replenishes the soil nearly as good as any planted species. Nonetheless, there are at least a few agroforestry activities which should be undertaken in the project.

- ..\* Stand enrichment in the "chume" may be possible by introducing fast-growing species suitable for poles, lumber, or fruit.
- \* Planting of a woody legume may improve the nutrient levels in "chume" soils.
- \* Pure-stand planting of fast growing species such as eucalyptus hybrids adapted for humid zones (hybrid seed available from Aracruz, Brasil) to feed the proposed particle board plant, or tropical pine for lumber.

Technical Assistance

Technical assistance (TA) is provided to IBTA/Chapare through the Experience Incorporated consulting team consisting of six long-term consultants (2-4 years). The project provided for 18 man-years of long-term consultancy, of which 12 man-years have been utilized to date. Table 8 summarizes the utilization of long-term consultants to date and our recommendation for utilization of the remaining budget for long-term consultancy.

TABLE 8: LONG TERM TECHNICAL ASSISTANCE CONSULTANTS SHOWING STAFFING LEVELS TO DATE AND RECOMMENDED FUTURE STAFFING LEVELS.

Consultancy Specialty	Staffing to Date (man-yrs.)	Recommended Staffing (man-yrs.)
Coodinator/Ag. Economist	2	2
Agricultural Economist	2	0
Extension	2	2
Tropical Horticulture	2	1
Agronomy & Systems	2	0
Soils & Fertilization	2	1

The project provides for 45 man-months of short term TA of which approximately 40 man-months remain available at this time. It is recommended that for short-term TA be focused in the following areas:

- Integrated pest management
- Marketing, processing and storage, post-harvest
- Agroforestry
- Pig improvement

Additional short-term consultants may, of course, be needed to address the needs of specific crops, etc.

The team of long-term consultants appears to have adequate technical backgrounds and have complied with contractual terms. They have done an adequate job given the conditions of the Chapare, but need to stimulate counterparts and be more aggressive and creative in the role of planning future research/extension priorities. However, we recommend

that the EI team take a more aggressive role in planning of research activities that produce technological packages utilizing both perennials and annuals. Two years of research effort has been focused primarily on annual crops and now is the time to shift emphasis to perennial crops. It is strongly recommended to consider the technological packages suggested in previous studies (MACA-PRODES-IICA, 1982) and select those that might be adaptable to Chapare conditions for further field investigation.

It is apparent that there are communication difficulties between the technical assistance team, SBDT officials and IBTA/Chapare researchers and extensionists. Furthermore, both the consultants and IBTA/Chapare personnel have admitted to being partly at fault in this matter. The essence of this problem is not clear-cut and is a very difficult one to assess.

- \* Consultants complain that their recommendations are ignored and that counterparts frequently exhibit technical prejudices which are difficult to overcome. This frustrates their effort and desire to provide effective technical services.
- \* IBTA/Chapare personnel complain that consultants do not make enough effort to communicate with them and do not spend enough time in the field.

Fortunately, both parties feel that this situation has improved considerably over time.

We recommend that the consulting team make every effort to spend as much time as possible in the field with IBTA/Chapare personnel and conscientiously attempt to overcome any potential communication barrier. Also it is recommended that one EI team member remain in the Chapare during the days the rest of the team is visiting Cochabamba.

On the other hand, IBTA/Chapare personnel must realize that part of the burden for the effective utilization of the consulting team lies on their own shoulders. If they feel that they are not obtaining the type of services or input that consultants should provide, it is the responsibility of each and every IBTA/Chapare technician to approach the consultants with their questions and needs, and to keep asking until the response they want is provided.

#### Environmental Adequacy of the Selected Crop/Livestock System

Environmental conditions in much of the Chapare region, and particularly in the more humid micro-regions, are ill-suited for the production of many crops. A number of the crops which are being promoted in the region could perform better under less humid conditions, and virtually all of the annual crops being considered for the Chapare can be grown better in other regions of Bolivia. However, the production of annuals such as maize, frijol, cow pea, rice and selected vegetables are

being promoted as a means to improve the local diet or to take advantage of marketing windows. As such, continued experimentation and promotion of these annual crops is highly justified. Even when economic analysis demonstrates that these annuals are "uneconomical", they can be critically important subsistence crops when the farmer and his family have no alternative employment opportunities.

The project's focus on large animals (buffalo and dairy cattle and their forage) is inconsistent with socio-economic and environmental conditions in the Chapare. There appears to be no justification whatsoever to maintaining the water buffalo. Maintenance of the dairy herd is also not justified because of:

- \* Poor genetic quality of the breeding stock.
- \* Excessive humidity which increases disease and related problems.
- \* Lack of interest in cattle production by farmers in the Chapare.

The continuation of the forage program is similarly not justified, since its sole purpose is to support the large animal program which is unsustainable in the area. Future livestock efforts should be focused exclusively on small animals (eg. pigs, chickens, ducks, rabbits, cuy).

#### Ecological Life Zone/Land Use Capability

The land use capability analysis, based on ecological life zones described in the PP establishes an objective foundation of ecological facts concerning the comparative suitability of the lands in the Chapare for sustainable human occupancy and socio-economic development. The analysis indicated that the widely-popularized beliefs in a high agricultural potential for the Chapare are in error. The failure to adequately plan and the resultant failure to achieve original agricultural goals may very well have been a major influence behind the voluntary decision by a majority of settlers to turn to coca production as a major economic activity.

By utilizing the life zone/land use capability analysis it is possible that the on-going development process might be re-oriented to take advantage of the particular opportunities which are offered by the specific ecological conditions of the Chapare.

The annual crops technological package developed by the IBTA/EI team is most adaptable to the northern half (drier) of the Chapare. However in wetter areas of the Chapare, along main trunk road and piedmont areas, clean-tilled annuals are uneconomic except as small scale components of semi-permanent and permanent tree cropping systems in rotation with naturally regenerated forest fallows. The land capability analysis indicates that this farmers experience is valid. While greater productivity and an enlarged assortment of commercial crops can probably be grown, it is not advisable to eliminate this agroforestry focus.

Agricultural extension and research program should incorporate this agroforestry and permanent crop approach. Both mixed and single species plantings should be tested to determine the best combination for given land and soil conditions.

#### Farm Planning Units

Soil suitability has been evaluated at the UPD's which comprise only a single field on a farm, but overall farm mapping and planning has not been undertaken. Each farm has its particular set of soil types, land forms, floodable areas etc. that the farmer has to deal with. The improvement of agriculture, even on small farms (10-20 Has.), requires as a pre-condition, the preparation of a farm plan, including a map of future production subdivisions and cropping and rotation schedule. We recommend that such a plan be based upon a detailed survey and map of the physical conditions of the farm. Technological packages developed should then take into consideration each land form and special soil conditions. The survey need not enter into detailed soil taxonomy, but rather indicate the soils, slope, drainage unit-combinations and their inherent individual production possibility, crop adaptation, requirements as to farming practices, and calendar of synchronized annual activities.

#### Marketability of Selected Crops

The PP focused largely, if not exclusively on the promotion and production of crops for market outside of the Chapare. However, if the prices for coca remain suppressed the production of subsistence crops will become an important activity in the future, as it has been in the past. This makes it both appropriate and necessary for the project to focus on some crops having limited market potential (example: the promotion of frijol and cow pea as a protein source).

Although annuals generally show little marketing potential, a few crops do show some promise if they can take advantage of market windows in Cochabamba or the local Chapare market. For example, the production of tomatoes is reportedly already profitable, as long as they enter the Cochabamba market between June and August when production in the Santa Cruz area is affected by cold. A similar window may exist for "choclo" maize. (A truckload of Chapare choclo was taken to Cochabamba during the last week of August but the farmer was unable to sell any. This may have been a marketing problem, since he attempted to circumvent established market intermediaries and sell directly to the public).

There appears to be a better market potential for perennials, coca being the most obvious example. Bananas and citrus have been important Chapare export crops for about two decades, and while the economic return is not high the market is well known. Coffee, being promoted as a new crop in the region, also has a known and accessible market.

Non-traditional crops such as macademia, cardomom and black pepper may have significant market potential, but the ability of Chapare products to compete in the markets is unproven.

There are several important market constraints that must be kept in mind. The high cost of transportation between the Chapare and Cochabamba will have a large influence on marketability. Trucking prices along this route are established in a monopolistic fashion and coca income has substantially inflated trucking costs. The continual washout of bridges and culverts makes the availability of transport uncertain during the wet season. The marketability of some crops is also affected by currently depressed economic conditions in Bolivia. However, the new Santa Cruz road may open a new and important market.

#### Feasibility of Campesino Implementation

The techniques being promoted by IBTA do not entail agronomic or processing activities any more complex than those required for coca production. For that reason it is felt that the level of technology being promoted by the project is not unreasonably sophisticated and implementation is well within the capability of Chapare colonists. The scale of implementation will be subject to market conditions and credit limitations.

#### Credit Needs and Linkages

As a result of coca production the Chapare has experienced a huge inflow of cash and there has been a high level of rural liquidity. This suggests that there is little, if any, need for credit activities. However, several factors have hindered the small farmer from translating coca income into savings or significant productive assets.

- \* Hyper-inflation from 1983 through 1985 effectively wiped out existing savings and effectively discouraged new savings. The purchase of dollars was the only liquid form of savings available.
- \* Most of the small farmers targeted by the Project have little previous money management experience. Many of their purchases were of limited productive value or had no productive value whatsoever. Examples range from second hand vehicles which quickly broke down to the purchase of beer "by the square meter".
- \* Newer colonists, with five years or less in the region, are still recovering the start-up costs of constructing a new home, land-clearing and planting.
- \* The coca boom inflated prices in the Chapare by perhaps 50%, diminishing the purchasing power of the inflated income.
- \* Much investment went into increased coca production, arguably the most productive investment available.

Interviews with farmers involved in the project, and casual inspection of their homes and farms, reflected little if any accumulation of wealth in any form as a result of coca production, with the exception

of an occasional chainsaw. Thus, while there are indeed many areas where the influence of coca wealth is visible (automobiles, housing improvements and restaurants), this is not the case for the farmers participating in the project who had been selected, in part, based on their limited area in coca production (and thus limited coca income).

Repeatedly farmers indicated that they are experiencing financial distress due to the collapse of the coca market and could not plant substantial areas of new perennial crops without credit. The principal impediment is not the cost of planting new perennial crops, but rather the expense of weed control for several years between the time of planting and harvest.

In view of these circumstances small farmer credit would substantially speed up project implementation, but is not essential. If the agronomic practices being promoted by IBTA are found to be economically viable, many of them will be implemented without loans, albeit at a slower pace.

Loans are considered critical to the successful implementation of only those activities where centralized processing centers can be important because: (1) production can be concentrated in a single geographic area having favorable soils and climate, (2) a centralized production area facilitates collection, and (3) a substantial volume of production can be realized over a short time span.

Will the provision of credit and other assistance provided by the Project cause coca production to increase? This issue can be effectively argued from both directions:

- \* NO. By implementing improved agricultural techniques and through the development of new markets, the farmer will be provided an alternative to coca production. In the absence of these alternatives, he will tend to produce subsistence crops for food and coca for cash, even when coca prices are quite low.
- \* YES. The Project will improve the farmer's infrastructure and utilization of inputs. It will promote development of the technical skills needed to apply these inputs effectively to increase yield. This knowledge and infrastructure can be readily transferred to the production of coca.

However, in the end it will be the price of coca, not the availability of credit or agronomic skill, that will determine whether or not credit or other Project assistance promotes coca production.

## EXECUTION OF RESEARCH AND EXTENSION ACTIVITIES

### Logistical Support

The project has been plagued by severe logistical support problems related to procurement. The process has not only been unreasonably long but has also resulted in purchased equipment having characteristics very different from that specified.

- \* Photocopy machines for Cochabamba offices were purchased through a dealer in La Paz rather than in Cochabamba, and as result the project must fly the technician in from La Paz every time the photocopier needs servicing.
  - \* IBTA/Chapare vehicle procurement required 18 months, and the vehicles which were obtained did not have heavy duty tires, esuspension systems and other components recommended for use in the Chapare.
  - \* A variety of hand tools were specified for 220 volt rating, but 110 volt machines were purchased (Bolivia uses 220 volt system).
  - \* Radio equipment was specified to have 120 watt power rating, but only 50 watt units were obtained.
- These problems appear to be largely within the USAID procurement process and caused considerable delay and frustration.

### Nursery Support

Nurseries have been constructed at the experiment stations; this stock is sold to farmers. Communities have also developed nurseries to support their own plantings. It is felt that insofar as possible future nurseries should be constructed by the communities because:

- 1) The cost per plant in a community nursery is lower than at the experiment station nursery.
- 2) Transportation costs are less because community nurseries are constructed near the areas to be planted.
- 3) Construction of community nurseries provides farmers with more skills making them increasingly self-sufficient.
- 4) Experiment station nurseries do not have adequate capacity to support a major planting program.

It is recommended that future expansion of nursery capacity be focused on community nurseries. Experiment station nurseries should focus on propagation of plants for experimental plantings and propagation of new varieties.

### Project Administration and Management

There has been a real and obvious effort to achieve results in the field, particularly on the part of IBTA/Chapare and EI. Furthermore, the IBTA/Chapare and EI Personnel have successfully adapted the general extension approach outlined in the Project. The positive results which have been achieved in the field to date stem directly from this approach.

On the other hand, inadequate attention has been given to the resolution of procurement problems which have constituted the greatest single hinderance to project implementation. This problem appears to be largely a USAID problem, although it appears that this problem could have been pursued more vigorously by the SDET and given more follow-up by EI.

From the outset the project has been plagued by conflicting interpretations of the relationship between SDET and IBTA/Chapare. Basically, the SDET staff felt that it has a supervisory role over IBTA/Chapare activities, whereas IBTA/Chapare felt that the SDET role was more appropriately one of coordination among the various agencies involved in the Chapare project. Unfortunately, the PP tends to be ambiguous on this issue. The net result is that SDET has developed an unnecessarily close supervisory role over IBTA/Chapare. This has resulted in an additional layer of bureaucracy within the project administration which, in many cases, has been detrimental to project execution.

It is strongly recommended that closer a relationship be developed between USAID and the Project to help resolve the procurement problems and to iron out differences among the various implementation entities. The SDET should focus more closely on coordination, credit and marketing-related activities and should not attempt to act as a technical reviewer to the IBTA/Chapare team. The SDET agricultural production coordinator should spend the majority of his time in the Chapare coordinating and planning a research extension activities jointly with IBTA technicians.

### ADMINISTRATIVE/INSTITUTIONAL DEVELOPMENT

#### Institutional Linkage

Administratively the CP and GOB counterpart was placed in the Ministry of Planning and Coordination (MPC) under the direction of its Subsecretary and directly responsible to the Inter-ministerial Committee (IMC) consisting of Subsecretaries of Finance, Interior, Defense, Foreign Affairs, Agriculture, Health, Education and Transportation. To insure GOB/USAID coordination between coca control and rural development programs the Subsecretary of Interior was included in the IMC to link coordination at the highest levels. The IMC meets periodically.

SDBT

Day to day project administration is delegated to the Secretariat for the Development of the Bolivian Tropics (SDBT) in Cochabamba. The SDBT is responsible for overseeing project implementation, coordination, planning, and evaluation activities. It is composed of the (1) Director, (2) technical coordination unit (agricultural production, agroindustrial development, regional planning, public works, field coordination, and evaluation) and (3) administration unit (controller, contract specialist, general services official). The director and key personnel are appointed by the IMC in consultation with MPC and USAID.

SDBT submits specific project implementation problems for resolution by the Chapare District Consultative Council (CODICH), composed of Cochabamba Departmental implementing agencies as well as Chapare farmer organizations (eg. Federacion de Colonizadores del Chimore and the Federaci3n Especial Agraria del Tropico).

For all institutions involved in the CP and especially the newly formed SDBT, the first two years of project implementation have been difficult at best. First, the success or failure of the CP is dependent on one important factor: the control of coca production. The lack of an effective coca reduction program greatly hindered Project implementation. Second, continual social agitation in Bolivia during 1984-85, including strikes and road blocks, caused serious setbacks in field implementation and work plans. Both socio-political problems and the humid climate of the Chapare restricted field work, resulting in an effective work period of six months annually. Third, the washout of roads and bridges, coupled with lack of funds for repair, creates a physical barrier which impedes implementation activities.

Despite the difficulties encountered by SDBT and IBTA/Chapare not one case was reported of an employee who abandoned his work to enjoy more lucrative incomes in the drug trade.

To date SDBT has not been able to fully exercise to its role as originally envisioned due to two basic problems: (1) The MPC has been weak in implementing the institutional framework of SDBT and as a result has given it relatively low priority and (2) USAID has not delegated sufficient responsibility and authority or clearly defined the role of SDBT so that it can function in an effective planning/coordination agency. The indifference that the GOB has shown the SDBT combined with strong USAID interest in project progress has resulted in an image where SDBT functions practically as a local division of USAID. Eliminating the large agroindustrial concept can help greatly in getting USAID back to a proper role in the Chapare compared to its present dominating position. This would require, however, a considerable strengthening of SDBT's capacities beyond what now exists. The institutional strengthening required for long term improvement could be established if USAID acted as a financing donor agency channelling funds through the MPC. Instead a hand-holding approach has been taken to insure that GOB counterpart

planning/ coordination activities progress without bureaucratic delay and that administrative positions are not subject to political whims. USAID must recognize that this current institutional arrangement, although advantageous for Project implementation may result in another impotent institution after project financing has terminated.

Within the last year SDET has accepted the responsibility of executing public works projects which have been important in gaining community and farmer confidence, but at the same time problematic for SDBT since project execution is not in their scope of work and as a result disperses the efforts and attention of their principal responsibility. Some of the funding for these public works comes from PL 480 which can not count on continuous funds due to shortages in the government treasury which only adds to the frustrations of SDET. In order to reinforce the SDBT coordinating/planning role it is recommended that future public works be placed with a regional implementing agency.

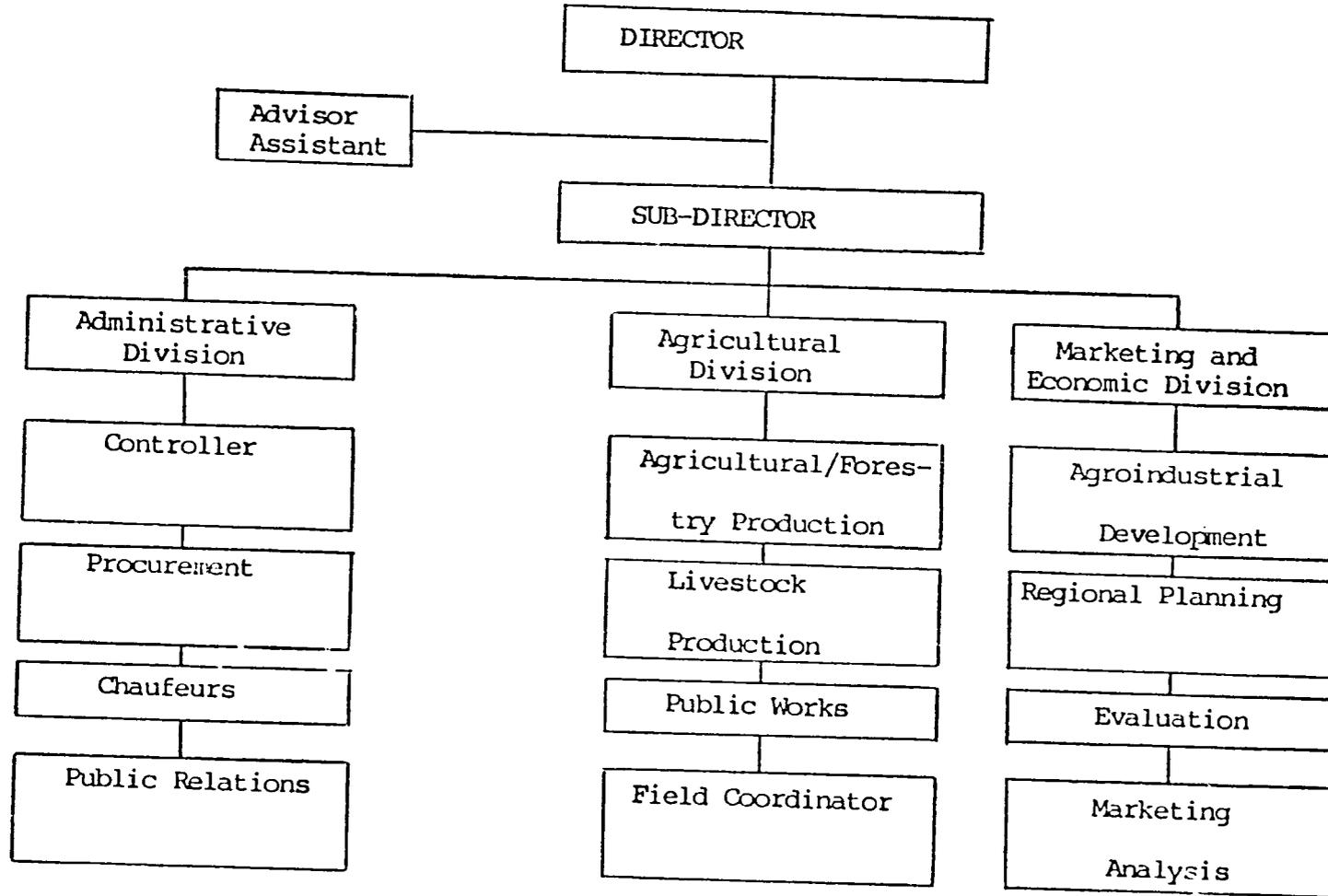
SDBT is probably overstaffed and requires reorganization. The individual scopes of work need to be reformulated in order to establish a new division which would take responsibility of the commercialization and market analysis of agricultural and forestry products produced in the Chapare. An initial idea for SDBT internal reorganization the creation of administrative, technical, and commercialization unit is suggested in Figure 3. In addition to utilizing employees more efficiently, there is an urgent need to administer more direct control over employees, including follow-up with coordination activities. One method for improving internal administration of SDBT is to establish standardized procedures for the following activities:

- 1) inventory control
- 2) credit analysis procedures
- 3) procedure for analyzing agroindustrial project feasibility
- 4) preparing progress reports and establish reasonable deadlines (15 days after report period terminates) for submission to appropriate project managers.

There are frequent needs for both SDET and IBTA to have joint planning or coordination activities; however, since staff members from neither institution hold a leadership role over the other, projects seldom are collaborated jointly. For example, publications for campesinos are needed that require input from both SDET and IBTA staff members, but as yet that coordination has not been realized.

SDBT reports, both administrative and technical to USAID project manager and controller seem to cover pertinent issues and relay honest assessment of the Chapare project. It is recommended that a reporting procedure format be established in to reduce paperwork and increase readership.

FIGURE 3 PROPOSED REORGANIZATION OF SDBT



### USAID Procurement

The purchase of field and laboratory equipment through USAID channels has been slow and problematic. Since purchases up to \$7500 can be approved locally this problem has been alleviated somewhat. Both IBTA and SDET need to implement a follow-up procedure where past procurement requests, complete with authorization dates, response, and observations are summarized so USAID procurement can conduct effective follow up.

### USAID Staffing

Currently within USAID there is one project manager, an associate manager, both located in La Paz and one project assistant located in the offices of SDET in CEB. The relationship between the associate manager and assistant is not well-defined, but the need is obvious for an administrative person to be located in CEB/Chapare. It is recommended that the future USAID project manager be allowed to devote only part of his time to administrative matters and another portion of time thinking about developmental strategy as the project evolves. The assistants for the project should spend at least 50% of their time in the project area (Chapare) in order to understand the socio-economic and technical implementation and advise the project manager of changes needed to insure that implementation runs smoothly.

List of Persons Interviewed

USAID/Bolivia

George Wachtenheim	Deputy Director
Robert Asselin	PD&I Chief
David Johnston	Private Enterprise and Rural Development Chief'
John Fasullo	Private Enterprise and Rural Development
Steve Miller	Chapare Project Director
Ronald Mercado	Associate Project Manager
Alfred Nakatzuma	Assistant
Oswaldo Antezana	Assistant Project Director
Angel Diaz	PD&I Deputy
Bambi Arellano	HHR
Don Yellman	U.S. Embassy, Chief NAU
Enrique Valverde	Head of NAU-CBB

Private Sector

Alfredo Alexander Ponce	Manager, Banco Industrial y Ganadero del Beni, S.A. Cochabamba
Dr. Oswaldo Tejada Ferrufino	Credit Manager, Bank of Cochabamba
Ing. Fernando Pessoa	Manager, Industrial Alimenticias del Valle, Cochabamba
Dr. Mauro A. Bertero G.	President, Banco Agrícola de Bolivia, La Paz
David Blanco	Executive Vice President, Banco Hipotecario Nacional, La Paz
Carlos Cossio	Yuca flour proposal, Cochabamba
Alfredo Salazar	Agropecuarias Copacabana, Cochabamba
Diane Anderson	Kudzu proposal, Cochabamba
Ing. Luis Arteaga Weill	Jefe Programa Agroquímica, CORDECO, Cochabamba
Ing. Oscar Rojas Villarroel	Industrial Engineering Dept., University of San Simón, Cochabamba
E. Sanchez de Lozada	Manager, Industria Maderera de Prensaje y Afinamientos S.A., Cochabamba
Dr. Miguel Rocha, M.D. Chapare	
Ursika Anders, Chapare	
Teresa Schreiber, Chapare	

SDBT-Cochabamba

Carlos Montaña	Director
Waldo Tellería	Technical chief
Rafael Vera	Evaluation Coordinator
Mario Candia	Coordinator of Credit
Antonio Torrico	Coordinator of Planning
Conrado Camacho	Coordinator of Public Works
Willy Holters	Administrative Chief
Enrique Jaldin	Crops advisor
Carlos Alarcón	Field Coordinator
Miguel Angel Garcia	USAID agroindustrial advisor

IBTA - Chapare

Francisco Zennier	Director
Jorge Aldunate	Director Ag. Exp. Sta. La Jota
Franklin Lastra	Director Ag. Exp. Sta. Chipiriri
Gerardo Rodríguez	Planning - Cacao
José Antonio Ramirez	Director, Communications Unit

Investigators - Chipiri

Felix Saavedra  
Sergio Torrico Fernandez  
Luis Prado Nogales  
Jaime Claure

Investigators - La Jota

Angel Cartagena  
Max Rojas  
Eduardo Ayala  
Luis Lennis  
Roberto Delgadillo  
Cesar Mealla  
Alicia Landivar  
Cesar Diaz  
Arturo Quispe  
Jose Camacho  
Onofre Torres  
Emigdio Gonzalez

"Promotores" (IBTA/Chapare)

Daniel García  
Augusto Espinoza  
Jesus Alcón  
Aurelio Moya  
Pastor Quiroga  
Angel Aries  
Francisco Rivas  
José Aguilar  
Guillenno Boño

Extensionistas

Javier Guevara  
Germán Inturias  
Arturo Quispe  
Juan Altamirano  
Leandro Chirinos  
Leon Vallejos  
Gumerindo Acosta  
Rolando Escobar

Experience Incorporated

Dr. Gerald Owens	Chief of Party
Dr. Merritt Taylor	Ag. economist
Dr. John Bieber	Farming Systems
Dr. Alfredo Alvarado	Soils Management
Mr. Joe Lopez	Extension agronomist
Dr. José Mondonedo	Horticulturist

Interministerial Commission

Dr. Freddy Heinrich      Subsecretary Min. of Planning and Coordination

Other related institutions

ENDE      Ing. Federico Lucero  
Ministry of Health - Saneamiento Ambiental  
    - Ing. Walter Soliz  
    - Ing. Juan Carlos Recaldes  
    Abel Lizarazu, USAID Advisor

SNC

Ing. Victor Ovando      Rural Roads II Project Director  
Lic. Silvia Angulo      Auditor  
Ing. Trinidad Zamora      USAID Advisor

MACA, Distrito de Riego No. 1, Cochabamba, Ing. Jorge Caballero, Director

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