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UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
Washington, D. C. 20523

BOLIVIA

PROJECT PAPER

CHAPARE REGIONAL DEVELOPMENT  
Amendment No 2

AID/LAC/P-418  
CR AID/LAC/P-276 & P-149

Loan Number: 511-T-067  
Project Number: 511-0543

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AGENCY FOR INTERNATIONAL DEVELOPMENT <b>PROJECT DATA SHEET</b>		1. TRANSACTION CODE <input type="checkbox"/> A = Add <input type="checkbox"/> C = Change <input type="checkbox"/> D = Delete	Amendment Number <u>2</u>	DOCUMENT CODE <b>3</b>
2. COUNTRY/ENTITY BOLIVIA		3. PROJECT NUMBER <input type="checkbox"/> 511-T-067 <u>511-0543</u>		
4. BUREAU/OFFICE L A C		5. PROJECT TITLE (maximum 40 characters) <input type="checkbox"/> Chapare Regional Development <input type="checkbox"/>		
6. PROJECT ASSISTANCE COMPLETION DATE (PACD) MM DD YY <u>08</u> <u>31</u> <u>91</u>		7. ESTIMATED DATE OF OBLIGATION (Under "B." below, enter 1, 2, 3, or 4) A. Initial FY <input type="checkbox"/> B. Quarter <input type="checkbox"/> C. Final FY <u>91</u>		

8. COSTS (\$000 OR EQUIVALENT \$1 = )						
A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total	2,000	1,850	3,850*	15,983	10,517	26,500
(Grant)	( 2,000 )	( 1,850 )	( 3,850 )	( 9,849 )	( 4,151 )	( 14,000 )
(Loan)	( - )	( - )	( - )	( 6,134 )	( 6,366 )	( 12,500 )
Other U.S.						
1.						
2.						
Host Country	-	1,360	1,360	-	34,747	34,747
Other Donor(s) (Beneficiaries)		-	-	-	11,000	11,000
<b>TOTALS</b>	<b>2,000</b>	<b>3,210</b>	<b>5,210</b>	<b>15,983</b>	<b>56,264</b>	<b>72,247</b>

9. SCHEDULE OF AID FUNDING (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) FN	253B	210	210	3,541	12,500	9,600	--	14,000	12,500
(2)									
(3)									
(4)									
<b>TOTALS</b>				<b>3,541</b>	<b>12,500</b>	<b>9,600</b>	<b>--</b>	<b>14,000</b>	<b>12,500</b>

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each) 140      150      070      240				11. SECONDARY PURPOSE CODE 210	
12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)					
A. Code		BS		BR	
B. Amount					

13. PROJECT PURPOSE (maximum 480 characters)

The purpose of the Chapare Project is to modify and improve the agricultural and forestry systems of farmers in the Chapare and AHV regions of the Department of Cochabamba to respond better to diverse, profitable marketing opportunities provided under sustained, environmentally compatible, medium technology production models.

14. SCHEDULED EVALUATIONS				15. SOURCE/ORIGIN OF GOODS AND SERVICES			
Interim	MM YY	MM YY	Final	MM YY	<input checked="" type="checkbox"/> 000	<input checked="" type="checkbox"/> 941	<input type="checkbox"/> Local <input type="checkbox"/> Other (Specify)
	08 88			03 91			

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a \_\_\_\_\_ page PP Amendment.)

The USAID Controller has reviewed the financial procedures described herein and hereby indicates his concurrence.

*John R. Davison*  
John R. Davison, Controller

\* This total includes \$1.15 million reobligated from Disaster Recovery and \$2.7 million reobligated from Rural Access Road II.

17. APPROVED BY	Signature <i>G. Reginald van Raalte</i>	18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
	Title G. Reginald van Raalte Director	
	Date Signed MM DD YY 11 23 87	MM DD YY 11 13 87

PROJECT AUTHORIZATION

AMENDMENT NO. 2

Name of Country:	Bolivia
Name of Project:	Chapare Regional Development
Number of Project:	511-0543
Number of Loan:	511-T-067

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, the Chapare Regional Development Project for Bolivia was authorized on July 29, 1983, and subsequently amended on January 10, 1986. That authorization is hereby further amended as follows:

-- The first sentence of paragraph 1 is deleted and the following sentence is substituted in lieu thereof:

Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Chapare Regional Development Project for Bolivia, involving planned obligations of not to exceed twelve million five hundred thousand United States dollars (US\$12,500,000) in loan funds ("Loan") and fourteen million United States dollars (US\$14,000,000) in grant funds ("Grant") over an eight year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB allotment process, to help in financing foreign exchange and local currency costs for the Project.

-- The third and final sentence of paragraph 1 is deleted and the following sentence is substituted therefor:

The planned life of the Chapare Regional Development Project is eight years from the date of initial obligation.

-- In Section e. "Covenants", the following paragraphs are added following the paragraph (viii):

Specifically for activities under this Amendment No. 2 to the Project Authorization, the GOB will covenant that, unless A.I.D. otherwise agrees in writing, it will:

Chapare Project Authorization  
Amendment No. 2.

(ix) certify via its agency "Dirección de Reconversión Agrícola of the Ministry of Agriculture (DIRECO/MACA), prior to expenditure of new Project funds under Loan and Grant Agreement Amendment No. 7 to benefit any Chapare community or its individual members, that a) the recipient community has eradicated since September 1, 1987, at least seventy percent (70%) of the community's hectares planted in coca, or that the community is not a significant producer of coca, and/or b) in the case of an individual member of a Chapare community who seeks credit or other benefits under the Project, that the farmer's community holds a DIRECO certificate as described in (ix-a) and further that the said individual has eradicated, since September 1, 1987, at least seventy percent (70%) of his/her farm's area planted in coca, or that the farm does not produce a significant amount of coca.

(x) agree that Project funds will not be disbursed for the implementation of any new sub-projects in agriculture, irrigation, or agro-industry prior to the obtention of an Environmental Assessment Amendment adding such specific new sub-project or group of sub-projects to the Environmental Assessment for the Chapare Project approved October 15, 1987 by the USAID Chief Environmental Officer for Latin America and the Caribbean stationed in Washington, D.C.

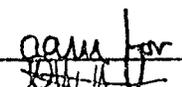
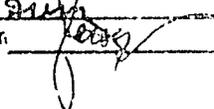
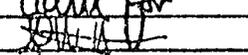
(xi) neither procure, cause to be procured, nor use any pesticide in any new sub-project prior to the obtention of an Environmental Assessment Amendment specifically approving the kind, amount, purpose and usage of the particular pesticide proposed for the sub-project, according to the Amendment process described in paragraph (x).

2. The amended authorization cited above remains in force except as hereby further amended.

  
G. Reginald van Raalte  
Director USAID/Bolivia

Drafted by: RLA; ANewton/PD&I; CAMillikan

Clearances:

CONT: JDavison  PD&I: ELKadunc   
DD: GWachtenheim  ARD: DHess 

CHAPARE REGIONAL DEVELOPMENT PROJECT PAPER  
AMENDMENT No. 2  
(511-0543)

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A C R O N Y M S

AHV	Associated High Valleys
BAB	Banco Agrícola de Bolivia/Bolivian Agricultural Bank
CDC	Centro de Datos de Conservación/Center for Conservation Data
CEDEAGRO	Centro de Desarrollo Agropecuario/Center for Agricultural Development
CENDA	Centro de Comunicación y Desarrollo Andino/Center for Communications and Andean Development
CIDRE	Centro de Investigación y Desarrollo Regional/Center for Research and Regional Development
CIFP	Centro de Investigaciones Fitotécnicas/Pairumani, Pairumani Crop Research Center
CORDECO	Corporación Regional de Desarrollo de Cochabamba/Regional Development Corporation of Cochabamba
COTESU	Cooperación Técnica Suiza/Swiss Technical Cooperation
CRDP	Chapare Regional Development Project
CUMAT	Capacidad de Uso Mayor de la Tierra/Land Use Capacity Institute
CRS	Catholic Relief Services
DEA	Drug Enforcement Agency
DRAPCO	Dirección Nacional de la Racionalización de la Producción de Coca/National Directorate for the Control of Coca Production
ENDE	Empresa Nacional de Electrificación/National Electrification Enterprise
FEPADE	Fé para el Desarrollo/Faith for Development
ETSFOR or ETF	Escuela Técnica Forestal/Technical Forestry School
GOB	Government of Bolivia
HIG	Housing Insurance Guarantee Project
HHI	Hydraulic and Hydrologic Institute
IBTA	Instituto Boliviano de Tecnología Agropecuaria/Bolivian Agricultural Technology Institute
ICI	Intermediate Credit Institution.
IPM	Integrated Pest Management

INM	Bureau for International Narcotics Matters
ITAC	Instituto de Tecnología Agropecuaria Canadá/Canadian Agricultural Technology Institute
MACA	Ministerio de Asuntos Campesinos y Agropecuarios/Ministry of Campesino Affairs and Agriculture
MPC	Ministerio de Planeamiento y Coordinación/Ministry of Planning and Coordination
MTCF	Market Town Capital Formation Project
NAU	Narcotics Assistance Unit
PAO	Private Agricultural Organizations
PADC	Program for Alternative Development for Cochabamba
PROCIPLA	Proyecto Control Integrado de Plagas/Integrated Pest Management Project
PVO	Private Voluntary Organization
RRII	Rural Roads II Project
SDBT	Secretariat for the Development of the Bolivian Tropics
SEPA	Semilla de Papa/Improved Potato Seed Service
SN	Servicio Nacional de Caminos/National Road Service
SNDC	Servicio Nacional de Desarrollo de la Comunidad/National Community Development Service
SSADCCS	Sub Secretariat for Alternative Development and Coca Crop Substitution
UCF	Unidad Crediticia Financiera/Financial Credit Unit.
UMSS	Universidad Mayor de San Simón/San Simon University
UNFDAC	United Nations Forum for Drug Abuse Control
UNDP	United Nations Development Programme
USG	United States Government

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## I. SUMMARY AND RECOMMENDATIONS

### A. Recommendations

This Project Paper Amendment recommends that the Chapare Regional Development Project (CRDP) expand its development activities into the Associated High Valleys (AHV) region of the Department of Cochabamba with the twin goals of (1) inducing out-migration of coca farmers and processors from the Chapare to the AHV region, where they would undertake legitimate agricultural activities, and (2) providing economic incentives to the AHV resident population to remain in place and not seek seasonal or permanent work in coca production in the Chapare. Thirty-two thousand agricultural producer households (160,000 people) will be added to the Project's beneficiary group by this reprogramming and expanding of CRDP activities.

The Amendment further recommends the extension of the Project Assistance Completion Date (PACD) to August 31, 1991, the addition of \$5.75 million in new grant funds, the reobligation to the Project as grant funds of \$3.85 million in loan funds deobligated from other Mission projects, the reprogramming of \$12.372 million in already-obligated project monies and the provision of \$30.7 million in new resources from Bolivia to achieve the CRDP's expanded objectives in reducing coca production/trafficking and promoting economic development in areas of Cochabamba Department.

Approval of this Amendment will result in the CRDP becoming an eight-year, \$72.3 million effort, with AID contributing \$26.5 million in Loan and Grant funds, the GOB providing \$34.8 million toward Project activities, and beneficiaries giving \$11 million in goods, services, and cash.

### B. Project Background

The Chapare Regional Development Project was signed by representatives of the GOB and the USG on August 12, 1983. At that time, AID's contribution to the Project was to be \$14.4 million in Grant and Loan funds, the GOB would contribute \$10.872 million, and beneficiaries would give \$10.991 million for a total of \$36.3 million over a five-year period. The Project was later expanded to a seven-year, \$38.8 million effort, with the USG contribution raised to US\$16.9 million.

Due to a lack of GOB civil control in the Project's target areas, initial implementation activities had to be delayed for one year after signing of the Project Agreement in August 1983. In late 1985, when activities had proceeded for only twelve months, they were largely suspended due to lack of GOB progress on coca eradication. A few minor activities were continued in the Chapare including agricultural research, production of plant materials, funding of three agro-industrial subprojects, and limited infrastructure maintenance. Because of the long period of suspension of major project activities, only \$4.5 million of project funds have been disbursed to date.

Recent coca-related actions by the GOB, changes in coca farmer and processor attitudes, and agreements by international donors have focussed fresh attention on the potential of the CRD Project. Most important to note

is the eradication of almost 300 hectares of coca plants nationwide (240 in the Chapare, the balance in the Yungas) between September 1 and 30, 1987.

Given these positive developments, and Mission expectation of further anti-narcotics progress, USAID/Bolivia believes that additional support for the CRDP is warranted. This Amendment expands the Project's target area and beneficiary numbers and groups, changes the emphasis of project activities, adds modest new funding and reprograms already-obligated monies. The Project's overall target of "encouraging a reduction in the cultivation and illicit trafficking of coca through the achievement of balanced economic development and an enhanced standard of living in the Project's target areas ...." remains unchanged. The Project purpose will be modified to include the expanded target area population, and will read "...purpose is to modify and improve the agricultural and forestry systems of farmers in the Chapare and AHV regions of the Department of Cochabamba to respond better to diversified profitable marketing opportunities...."

#### C. Changes Proposed by this Amendment

This Amendment proposes that the CRDP's geographic focus be expanded to include activities in the Associated High Valleys' (AHV) region of the Department of Cochabamba and that project-financed activities in the Chapare region of Bolivia be conditioned on significant eradication of coca by those individual farmers and communities who benefit. A part of this Project reformulation is the development of a strategy to encourage a significant proportion of the farmers and laborers who had migrated to the Chapare during the last several years from the Associated High Valleys (AHV) to a) return to their places of origin and b) forsake involvement in coca production and processing. The success of this strategy will depend on the GOB's continuing to meet planned coca control targets.

The philosophy behind the amended Chapare effort is the testing of a model in which integrated investments are made to improve the social and economic development potential of selected areas of origin of migrants, in order to foster both return migration and the retention of existing residents. At present, the migrants or potential migrants are drawn away from their highlands farms by the lure of vastly improved incomes available from the Chapare's coca growing and processing activities. It is posited that the increasingly serious GOB efforts to impede coca production, plus improved local opportunities to increase income legally, will together work to retain farmers still resident in the AHV areas of Cochabamba, and also to attract back some of those who have left. As explained more fully below, this philosophy is viable only if the GOB anti-coca efforts are professional, sustained, and properly targetted. Recent improvements in Government eradication and interdiction activities indicate that this is increasingly the case.

The Amendment model concentrates on four principal development areas: 1) Agriculture and Forestry Production, 2) Rural Industry and Marketing, 3) Productive and Transport Infrastructure, and 4) a Project Investment Fund. Each element will include activities of immediate, short-term impact as well as applied research components to support medium and

long-term activities which will lead to the consolidation of the model. If the model is successful, it may provide the base for designing a larger effort to expand the model components to the areas of origin of other migrants to the Chapare. The model also provides benefits to those farmers who stay in the Chapare, but significantly reduce their cultivation of coca.

The proposed Project Agreement Amendment reflects a USAID/Bolivia/GOB agreement on the best means for achieving the Project's coca-related objectives, as well as for the most effective reprogramming of remaining project funds. The Amendment is fully consistent with the revised USAID/Bolivia narcotics-related development strategy as discussed in La Paz 10184 of November 28, 1986 and subsequent cables, including those in the classified Annex to this Amendment.

Resources from other USAID projects will be coordinated to contribute to achievement of modified CDRP objectives. These collaborative projects include Private Agricultural Organizations, Market Town Capital Formation, Housing Insurance Guarantee, and Emergency Agricultural Credit reflows managed by the PL 480 Executive Secretariat. A narcotics awareness program dealing with the issues of drug abuse, delinquency, and the overall impact of coca/cocaine production and trafficking on the economy will also be developed in both the Chapare sub-region and the Associated High Valleys target areas.

A new life-of-Project AID funding amount of \$26.5 million is proposed (US\$12.5 million loan, US\$14 million grant) by this Amendment. Only US\$5.75 million of this sum represents new money for Bolivia. The Mission is currently deobligating \$2.7 million in ARDN loan funds from the Rural Access Roads II Project (511-T-061) and \$1.15 million in ARDN loan funds from the Disaster Recovery Project (511-0581), and reobligating the \$3.85 million to the CDRP as grant funds. In addition, US\$ 12.372 million of already-obligated funds will be reprogrammed. Thus, a total of US\$21.972 million of USAID resources will be focussed on the expanded goals of the CDRP Project.

Finally, it is important to note that this Project Paper Amendment sets certain conditions which must be met in order for Project implementation to continue (Section III. E. "Conditionality"). Essentially, conditionality currently in place for the Chapare would be made more stringent (all but a few minor activities on hold until specified conditions are met), while modest development activities in the AHV region would begin immediately upon Amendment approval (repair of irrigation and electrification systems for example) to be followed by longer-term activities. None of the development work proposed for the AHV region would be linked to Chapare eradication and interdiction efforts. This conditionality, applying to the Chapare coca-producing regions but not affecting development activities in the migrants' areas of origin, will help ensure that Project funding supports both the development objectives and the narcotics control and eradication objectives of the USG's program in Bolivia.

The Revised Summary Budget for the Project follows.

D. Revised Summary Budget

CHAPARE REGIONAL DEVELOPMENT PROJECT  
(511-0543)

SUMMARY BUDGET

Project Elements	A I D					H O S T C O U N T R Y			GRAND TOTAL
	Previous Budget	This Amend.	Previous Budget	This Amend.	AID Total	Previous Budget	This Amendment	Host (1) Country Total	
I. Agriculture Forestry Production	-	575	3,682	-	4,257	613	19,180	19,793	24,050
II. Rural Industry & Marketing	240	-	804	-	1,044	810	1,900	2,710	3,754
III. Productive, Trans. and Community Infrastructure	-	4,900	701	-	5,601	-	3,741	3,741	9,342
IV. Investment Fund	-	-	1,042	-	1,042	2,696	-	2,696	3,738
V. Implementation Planning and Studies	116	-	88	-	204	-	-	-	204
VI. Institution Building	3,924	3,495	5,776	-	13,195	822	4,125	4,947	18,142
VII. Evaluations/ Audits	-	140	53	-	193	-	-	-	193
VIII. Contingencies	120	490	354	-	964	-	860	860	1,824
TOTALS	4,400	9,600	12,500	-	26,500	4,941	29,806 (2)	34,747	61,247 (3)

(1) PL 480 and GOB Treasury

(2) Includes US\$17.5 million from the Emergency Agricultural Credit Project (511-0591) reflows.

(3) Beneficiaries will contribute approximately US\$11 million to the Project for a total Project investment of US\$72,247. This sum is not included in the official budget because it is largely in-kind and will be distributed among components only as the sub-activity base is fully defined during Project implementation.

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## II. AMENDMENT BACKGROUND, RATIONALE, AND STRATEGY

### A. Background

#### 1. Development Context

Most Bolivian coca production is concentrated in two regions of the country -- the Yungas (La Paz Department) and the Chapare (Cochabamba Department). Yungas farms have traditionally supplied the legal domestic and export coca markets (although illegal production has increased in this region in recent years).

The Chapare region contributes almost exclusively to illegal coca production. In this region of 2.5 million hectares\*, only 200,000 hectares are settled. Of these, approximately 91,000 hectares (48 percent) are cultivated. Coca, with about 60,000 hectares planted (66% of all cultivation), is the most extensively grown crop, followed by rice (10,416 hectares), citrus (9,098 hectares), banana and plantain (8,000 hectares), cassava (yuca) (2,910 hectares), and corn (2,440 hectares). Numerous other annual and perennial crops are cultivated in lesser quantities. The existence of this particular mix of crops is a direct response to the environmental conditions of the Chapare, that is to the region's extreme wetness and high soil acidity.

A variety of ecological factors constitute key constraints to expanded agricultural and forestry production in the Chapare. Extremely high rainfall, poor drainage, and severe flooding are some of the principal limiting factors. In addition, the short dry season results in several problems, including insufficient time to clear pastures of weeds, a high seasonal demand for labor, and difficulties in drying and storing certain commodities (corn and rice). Finally, soils in the Chapare are of recent origin. They are clay-based, but vary considerably in quality, ranging from the rich alluvial soils along the river banks (the best for agricultural purposes) to poor heavy soils further inland. Erosion, excessive moisture in the soils due to seasonal flooding, rapid loss of fertility through leaching, bad drainage, acidity, and lack of organic materials are the main soil factors limiting agricultural and human occupation potential in the Chapare.

The Chapare has more than 60,000 agricultural producer households (210,000) people, each with an average of 3.5 persons\*\* and each cultivating 1-20 hectare plots. These farmers are reported to produce about 80 percent of the total coca grown in Bolivia and 90 to 95 percent of the Bolivian coca entering the illicit international market. The Chapare temporary population, largely consisting of merchants, narcotics middlemen, and day laborers (coca leaf pickers, carriers and stompers), fluctuates between 30,000 and 80,000 individuals. The total population of the Chapare is expected to vary between 240,000 and 290,000 people in 1987.

In this geographic area, coca production has significantly increased since 1979, attributable to the increased number of coca growers

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\* A hectare equals 2.49 acres.)

\*\* Average family size in Bolivia is 5 persons. However, many agricultural producer households in the Chapare are based on migration from other areas and are incomplete, giving a smaller average household size in this region.

spontaneously migrating to the Chapare, the growing international demand for cocaine, and the fact that Chapare soils produce a high alkaline coca variety preferred by cocaine producers. An undetermined, but reportedly large and growing, number of small farmers now process their own leaves and produce coca paste, at or near the harvest site.

The most reliable information now available on the minimum farm size for Chapare crop and livestock production (excluding coca production) is 8-15 hectares, with an average size of 12 hectares. Therefore, the minimum necessary hectareage for the present estimated resident population, should all coca be eradicated, is 600,000 hectares\*. A detailed land use capacity study in the Chapare has shown that the maximum cultivable land available is 134,744 hectares divided among 4,075 hectares for intensive cultivation, 55,772 hectares for extensive livestock grazing, and 74,897 hectares for tree crop cultivation. Therefore, current population estimates indicate that approximately 45,000 households would not have adequate land and income resources, if coca were not cultivated.

Virtually all the residents of the Chapare are immigrants from other regions of Bolivia. The highest proportion, approximately 80 percent, are natives of the Department of Cochabamba. The people can be divided into three groups according to area of origin: 1) those from high altitude areas of Chapare Province (e.g. Sacaba, Colomi, and Melgar); 2) those from the most productive region of the Cochabamba High Valleys (e.g. Punata, Cliza, and Arani); and 3) those from the least developed but potentially productive region of the Southern district of the Associated High Valleys (Mizque, Campero and Esteban Arze). (Please refer to maps, Annex J.)

The higher altitude areas of the Chapare have a total population of approximately 50,000 people (10,000 agricultural producer households) whose main source of income comes from the production of potatoes, green beans, and barley. The more prosperous areas of the high valleys have a total population of about 175,000 people (35,000 families) which produce most of the corn and vegetables consumed in the city of Cochabamba. These two regions are characterized by better developed infrastructure/production systems (rural roads, irrigation works, technical assistance, marketing services) relative to the southern district. An additional economic advantage is their proximity to Cochabamba, the most important regional market center.

This Project will not directly assist, except for a few marginal areas, Chapare's higher altitude zones or the relatively more prosperous parts of the High Valleys. The rationale is that these two areas are already receiving assistance from both public and private institutions financed largely by international organizations, and have achieved reasonable standards of living in the Bolivian context.

The Project will therefore serve the relatively poorer areas of the Associated High Valleys (AHVs) in the Southern district and Tarata. While these areas have a high economic potential, they are currently receiving very little financial support from private and public organizations. It is

\* (10 hectares x 60,000 households. 8 hectares per family are only sufficient for the most fertile areas.)

estimated that the Project will turn at least 7,000 area families away from coca production toward legal economic pursuits. This 7,000 total is composed of a) an estimated 4,500 households which currently hold land in the Southern District/Tarata area but are working in the Chapare (who post-Project would stay permanently in the former region due to the improved economic and living conditions created by the Project), and b) families who would migrate permanently to the target areas as a result of the employment generated by activities funded by the Project, such as the financing of irrigation systems.

## 2. Project Progress To Date

USAID/Bolivia and the Government of Bolivia, as a first step in implementing the development portion of a narcotics control strategy, signed a \$14.4 million Chapare Regional Development Project (CRDP) on August 12, 1983. (The Project was later amended to bring Project funding to \$16.9 million). No activities were initiated, however, until August 1984, when the Bolivian Government reestablished civil authority in the Chapare.

Although the CRDP has been operational for almost 3 years, only a limited portion of its resources has been disbursed because of delays in the implementation of the GOB narcotics control program, to which Project implementation is linked. A number of critical events which occurred during the last quarter of 1986 and the first half of 1987 have led USAID/Bolivia to reconsider its narcotics-related development strategy and program, including the Chapare Project. Principal among these are: (a) the completion of a comprehensive mid-course evaluation of the Chapare Regional Development Project itself; (b) the USG-assisted Operation "Blast Furnace" interdiction effort's impressive effect in depressing coca leaf prices; (c) the mid-October 1986 USG-GOB bilateral narcotics commission meeting; (d) a two-day meeting sponsored by USAID/Bolivia to review the USAID narcotics-related development strategy and programs with counterparts and GOB officials; (e) the World Bank consultative group meeting in December 1986; (f) the development of the GOB's Three Year Anti-Narcotics Program and its presentation in two separate international fora at the United Nations Forum for Drug Abuse Control (UNFDAC) headquarters; (g) the negotiation and signing of the 1987 GOB-USG Anti-Narcotics Agreement; (h) the negotiation and signing of an agreement between the GOB and coca grower federations establishing the outline of a program for eradication and substitution; and (i) the surprisingly successful launching of the voluntary eradication phase of the GOB's Three-Year Plan with the eradication of almost 300 hectares by September 30, 1987. The combination of these events has resulted in significant modifications to the Mission's narcotics development approach. (NOTE: These events are discussed more fully in the next Section II.B.1.)

The narcotics-related development strategy originally devised by USAID/Bolivia in 1982 was designed to focus development resources on Bolivia's principal illicit coca growing area, the Chapare region of the Department of Cochabamba. Financing was provided from four sources: the new Chapare Regional Development Project; redesigned elements of two older projects -- Rural Access Roads II (511-0466) and Rural Sanitation (511-0458); and local currency from the PL-480, Title III Program. A basic precept of the established program strategy was that what became collectively known as the "Chapare Project" could only be successful in the context of an ongoing and successful drug interdiction and coca eradication program. Without such a

program, no development effort, no matter how successful, could ever compete economically with coca. In the context of a successful control (interdiction/eradication) program, the Project sought to develop reliable, remunerative markets for the legitimate crops already being grown in the Chapare. This was to occur through the development of small to medium scale agribusinesses and by reinforcing technical assistance and training support to be provided through agricultural research and extension programs. The Project also included resources to develop economic and social infrastructure and an agricultural credit component.

In early 1982, the Bolivian police were driven out of the Chapare by farmers incited by narcotraffickers. While the Project was signed between the GOB and USAID in August 1983, Project activities were on hold until August 1984, when Bolivian Government agents reestablished their control of the region. Thereafter, initial Project disbursements were directed at doing a number of visible, but low-cost, infrastructure activities (e.g., potable water systems, health clinics, schools, farm-to-market road improvements) to establish the Project's credibility with local residents.

After approximately a year of these confidence-building Project activities, because of relatively little GOB progress on narcotics control in the region, USAID put an informal freeze on further infrastructure development. Infrastructure activities have stayed at a virtual standstill since this time because, in the absence of controls, certain infrastructural elements could benefit narcotics traffickers (e.g. an upgraded farm-to-market road serving as a trafficker landing strip.) An exception to this freeze in 1986 was a GOB-negotiated, USG-approved, quid pro quo road-improvement-for-coca-eradication agreement with the Chapare community of Eterazama. This grass-roots trade-off met with some initial success, but the program eventually died when only a minimal amount of coca was eradicated (approximately 175 hectares) by the community. Still, this effort can be considered the single "significant" farmer eradication to have taken place in Bolivia prior to September 1987.

The only elements of the Chapare Project package to proceed with relatively little interruption have been agriculture research and extension provided by IBTA/Chapare and supported with technical assistance from Experience Inc. under an institutional contract. These elements offer virtually no risk of misuse, have been generally well received by farmers in the region, and provide a basis for the development of alternative crops to coca.

The agroindustrial development portion of the Project strategy has had limited success to date, having made only modest disbursements. This is explained by three factors. First, because of its narcotics-induced instability, the Chapare has not been an attractive investment area for the entrepreneurs targeted by the Project. These entrepreneurs recognized that without successful coca control efforts, Chapare farmers could not be relied upon as suppliers of raw materials to their agroindustries. Second, because of risk considerations, private commercial banks set nearly impossible conditions on loans for investment in the outlaw-dominated Chapare. Third, few of the originally identified agro-industrial projects proved feasible when detailed analyses were carried out. There are, however, three agro-industrial activities which have gone forward.

3. Critical Events: 1986-87

It is important to understand the events which prompted a change in the USG narcotics-related development strategy for Bolivia. In the case of Operation "Blast Furnace", the GOB, with U.S. assistance, began an unprecedented, intense narcotics interdiction effort in July 1986. "Blast Furnace" took place mostly within Bolivia's Beni and Santa Cruz Departments and was complemented by INM-supported interdiction activities in the Chapare. These effective actions virtually closed down narcotics processing and trafficking activities in the country. This caused a sharp drop in the demand for coca leaves and, therefore, in their price. From August through October 1986, coca leaf prices fell far below the cost of production. This price drop provoked unusual interest on the part of Chapare farmers in obtaining the legal agricultural plants developed and available in the USAID Project-supported agricultural nurseries. It also resulted in coca-related workers, merchants, and farmers leaving the Chapare and returning to their places of migratory origin. Many coca growers did not harvest their leaves, as the cost of the required labor exceeded the expected financial return. This experience is considered extremely significant to future USG and GOB narcotics control and development strategies.

With regard to the October 1986 bilateral narcotics commission meetings, during these sessions the GOB made known its intention to declare all but a small area of the Yungas (La Paz Department) off limits to coca production. It is expected that this policy will be formalized in a narcotics law being prepared for the approval of the Bolivian Congress. The Senate has already approved the law (March 1987) and the Chamber of Deputies will consider final approval during the new 1987/1988 session of Congress which opens in August 1987.

The Bolivians, following the "Blast Furnace" experience and model, believe that an effective, sustained interdiction program will help convince coca producing campesinos (through low prices and increased perception of economic risk) to eradicate their crops voluntarily. Such actions, the GOB feels, must be complemented by development activities designed to facilitate and speed-up the transition to legal economic undertakings. If the voluntary program should not succeed in accomplishing all of its objectives within one year, a forced eradication program would follow.

On November 13-14, 1986, USAID/Bolivia sponsored a two-day meeting involving key Project counterparts, GOB officials, the leader of the Chapare evaluation team, NAU, and Mission staff to discuss the future of USAID narcotics-related development activities. The primary focus of the retreat was to identify appropriate utilization of resources already available in the pipeline to meet USG and GOB narcotics control objectives. The observations/conclusions of these sessions are summarized in Annex E. Agreements reached during this meeting contributed directly to this Amendment.

In early December 1986, a meeting was held in Paris, France, sponsored by the World Bank Consultative Group on Bolivia. At that meeting, the GOB presented the first draft of its Three Year Anti-Narcotics Plan.

This Plan\* was strongly supported by the USG and other governments and international organizations. The Plan was further developed in the month of January 1987 in collaboration with USAID/Bolivia and UNFDAC, and it was presented to an international forum of donor organizations held at UNFDAC's headquarters in Vienna, Austria, in early February. The principal result of that event was to schedule a further meeting in early April at which the GOB presented the complete draft of the Plan and received several commitments for financial and technical support for its implementation from the USG, the Federal Republic of Germany, Italy, Great Britain, and Spain, as well as UNFDAC.

In February 1987, the GOB and the USG negotiated a new Bilateral Framework Agreement on Narcotics. The basic agreement was signed on February 24. The two governments then entered into negotiations on two detailed annexes spelling out the precise nature of activities and support for them in the areas of interdiction and development. The annexes were signed subsequently in August. They provide the general lines of USG support for implementation of the Three Year Plan.

In March 1987, the Bolivian Senate approved a Law on Dangerous Substances which provided a tough new set of penalties for narcotics production and trafficking. The Law also, for the first time in Bolivian history, defined legal and illegal areas in which coca could be cultivated. The Law further established procedures for the launching of a voluntary phase of eradication of coca in illegal areas and the subsequent implementation of involuntary eradication. The final passage of this law will be debated in the Bolivian Chamber of Deputies in late 1987 or early 1988.

In May and June 1987, the GOB held intensive negotiations with the Bolivian Workers' Central Union and Federations representing a large number of coca growers. The result of very long and difficult discussions was an historic agreement among those parties that a concerted war on narcotics trafficking in Bolivia was necessary and that all parties would do their part in that effort. Further, for the first time, the coca growers' Federations acknowledged that much of the coca production in excess of traditional demand was being used for the production of narcotics. While this is a seemingly obvious fact, the public acknowledgement of it was a real breakthrough in the GOB's dialogue with this sector of its population. The agreement bodes well for the difficult period of implementation of the anticipated new law.

Finally, in September 1987, the GOB launched the voluntary eradication phase of its Three-Year Plan. The unexpectedly positive result of this effort has been the eradication of almost 300 hectares by September 30, 1987. This exceeded the USG/GOB agreed upon target of 250 hectares by the same date. While it is too early to know whether these accomplishments will continue, the Mission believes, on current evidence, that they will.

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\*A summary of this Anti-Narcotics Plan is found in Annex D.

B. Amendment Rationale

The rationale for the Project Amendment is to contribute to the overall USG goal of reducing the production of cocaine and related narcotic products and their flow into the United States. This will be accomplished by: (1) using the resources and the leverage of USAID projects to support effective Bolivian Government narcotics eradication and control programs; (2) carrying out social and economic development programs in the Chapare and the Associated High Valleys of the Department of Cochabamba, thereby facilitating the transition away from coca production; (3) conducting a nationwide narcotics awareness program; and (4) involving other bilateral and multilateral donors in Bolivia's coca control and eradication programs.

The U.S. strategy for reducing the production of illegal coca and halting drug trafficking in Bolivia considers narcotics control and economic development as essential and complementary aspects of the reduction effort, both necessary in order for it to be successful. No single agricultural crop or combination of crops can provide farmers with the income they can earn producing coca for the illegal market. The development effort in the Chapare and Associated High Valleys of the Department of Cochabamba can serve only as an important incentive to facilitate the decision of farmers to produce other crops and to lessen their economic dependence on the cultivation of coca. Interdiction, which keeps the price of coca leaf below production costs, and increases the economic risks for involvement with coca production, is the essential condition for convincing farmers to abandon coca for other crops.

The USAID narcotics-related development strategy reviewed and approved by AID/W in 87 STATE 065511 (Annex C), and revised in La Paz 9546, of October 6, 1987, is essentially an economic and social one. As narcotics control efforts are implemented and have their designed impact, market prices for coca leaves will fall as the product is in oversupply. The reduction in demand for leaves results from a reduction in trafficking due to effective interdiction efforts (e.g. arrests, seizures, and destruction of laboratories). In addition, when effective forcible eradication programs are implemented, coca farmers will be at risk of losing their entire primary source of income. Faced with unreliable markets and repressive actions against their primary source of income, economically rational farmers will be increasingly motivated to cooperate with the Government's control programs and take advantage of the Chapare Regional Development Project's resources to diversify their agricultural production away from dependence on coca.

The Associated High Valleys will receive investments which will serve as catalysts for out-migration from the Chapare region. As the evidence presented earlier in Section II.A.1. "Development Context" indicates, with the anticipated decline of the coca economy, the level of population which the Chapare can support will drop by as much as two thirds because of extremely limited economic potential. Therefore, creation of new economic opportunities and improved social conditions in areas of origin of migrants (in the Associated High Valleys in this case) will facilitate the transition of many of the people leaving the Chapare. The investment strategy in the AHV area will draw principally on resources from the Chapare Regional Development Project, but can also tap resources from other USAID projects.

As mentioned repeatedly, the Chapare Regional Development Project and other related development investments can only be successful if Government narcotics control efforts are effective. The task of reducing the production of coca in the Chapare and halting drug trafficking in Bolivia is the responsibility of the USG-assisted Bolivian Government narcotics control program. In support of this program, project development benefits are conditioned on beneficiary compliance with GOB control and eradication efforts. In addition, it is the Mission's strategy to use this part of the AID program in Bolivia as leverage to induce the Government to take more aggressive action with regard to control and eradication activities. Moreover, the Mission believes that other international donor involvement in both the development and control elements of the program is important for success, and the Mission is therefore taking steps to encourage such involvement.

C. Amendment Strategy

1. Overall Strategy

The strategy to be applied by USAID/Bolivia in the use of its narcotics-related pipeline is based on the following premises:

1. The Chapare Regional Development Project is not a typical A.I.D. development effort. The principal goal of these activities is to contribute to the realization of the USG strategy to reduce the flow of narcotics (i.e. cocaine) out of Bolivia. However, the Project is designed to have important beneficial economic and social development impacts in the target region.
2. It bears repeating that, absent an effective narcotics control program, development activity will not convince people to stop growing coca or to cease involvement in other aspects of the narcotics market. However, development activities are important (the GOB says essential) catalysts to the economic, social and political facilitation of anti-coca behavior.
3. Infrastructure activities in the Chapare will be conditioned on continued progress in coca control and eradication. This will avoid the potential misuse of Project benefits by narcotraffickers and will also result in a more productive use of Project funds.
4. The current phase of narcotics-related development implementation is considered to be transitional to a larger scale effort that would result from additional USG and other donor resources as proposed in the GOB's Three Year Anti-Narcotics Plan. Other donors' resources, it is presumed, would also be conditioned on substantive evidence of GOB progress in carrying out coca control and eradication efforts.

To summarize, the strategy to be followed is premised on an effective and sustained narcotics control program and the expansion of the geographic focus of Project activities to the Associated High Valleys region of the Department of Cochabamba. The Project will finance activities in the AHV region in agriculture and forestry production; rural industry and marketing; productive, transport, and community infrastructure; investment financing; implementation analysis and planning; and institutional development. Concomitantly, agricultural research extension activities and infrastructure upgrading will continue in the Chapare subregion in order to supply viable alternatives for those farmers who remain there and significantly reduce their coca plantings. Agricultural credit and community and transport infrastructure will be made available in the Chapare conditioned on certification that the individuals and communities who most directly benefit are not growing coca or have significantly reduced their coca production.

Community education along with public information and orientation will play important roles in the CRDP strategy. The use of radio, print media, and other non-formal channels to offer technical information is considered vital to the success of the activities detailed above. In addition, carefully prepared media programs dealing with issues such as the impact of migration on Chapare families and their communities of origin, the ecological degradation caused by extensive coca production, rational use of pesticides, drug abuse, delinquency, etc. will help to create a climate supportive of project goals. Part of these educational activities will be funded under the CRDP; others from the Narcotics Awareness Project.

This strategy of linking development activities with an effective narcotics control program is expected to encourage farmers and laborers who have migrated to the Chapare in large numbers during the last several years from the AHV regions of Cochabamba to give up their involvement in coca production and processing and return to their areas of origin. There will also be economic rewards for Chapare farmers who significantly reduce or never grew coca, as postulated in the original project design. The amended effort will be a large-scale test of a model of integrated investments to improve the economic and social potential of selected areas of origin in order to foster return migration and retention of existing population. If successful, the funding of a larger effort for expanding the impact of these activities to areas of origin of many more people who will leave the Chapare will be considered. This Project strategy is consistent with the revised USAID/Bolivia narcotics-related development strategy provided in 86 La Paz 10184 of November 20, 1986, La Paz 9547 of October 6, 1987, contained in Annex C, and related cables.

## 2. Specific Implementation Strategy

The strategy for implementation of the amended CRDP is based on immediate activities, pre-investment studies, and medium term activities. These elements will work in an interdependent fashion to test the Amendment model. The rationale for these elements is based on the fact that there is a need to begin visible, concrete activities which indicate clearly the commitment of the Project to the improvement of economic opportunities in the Associated High Valleys while, at the same time, studies on the social, economic, and physical constraints and possibilities must be completed to

determine which medium term activities would most effectively increase the development potential of the target areas.

The immediate activities (defined in Section VI.A.1., "Subproject Implementation Plan") will begin shortly after signing the Amendment with implementation of technical assistance, training, and specific investment activities and public works in the AHV region.

Simultaneously, pre-investment studies will be carried out to collect data and analyze the feasibility of medium-term investments related to all of the Project's components. The studies will include: land use capability and watershed management planning; biological diversity; forest inventory and management planning; livestock management (extensive grazing); cropping systems; marketing; agro-industrial and artisanal industry development potential; social organization and community management of water resources; a feasibility study of the Vacas-Arani irrigation activity; a hydrological study of the Tucma River, a master plan for the Mizque plain; and a feasibility study of mini-hydropower plant potential in Project areas.

The final component of the specific implementation strategy is carrying out medium-term activities, based on the foregoing studies.

D. Relationship of Project Amendment to Mission Assistance Strategy  
Project

The revised CRDP is a major element in the Mission's Anti-Narcotics Strategy as discussed earlier. A number of components and activities of other programs and projects will be utilized to assist in the achievement of the objectives of that strategy and, as such, will also support CRDP activities. The Economic Support Fund transfers will be crucial in providing the GOP with the budgetary flexibility to implement, from its own resources, the Agricultural Transition Fund (to assist coca farmers who cooperate with the voluntary eradication program). Activities of the PL 480, Title III Rural Infrastructure Program will be important in improving infrastructure in the AHV region of the Department of Cochabamba and in those communities in the Chapare participating in voluntary eradication. The Rural Access Roads II and Rural Sanitation Projects have been implemented in close coordination with the CRDP to date and the nature of that coordination will increase as those projects reach their PACD. A follow-on Project is planned for the latter activity. The Private Agricultural Organizations Project will coordinate its activities with the CRDP in order to maximize its impact on producers' groups in the AHV area and those groups in the Chapare participating in voluntary eradication of their coca. Further, the Market Town Development Fund Project will explore ways to promote agro-industrial development in the CRDP Project areas.

In addition, priority for the use of the reflows from the Emergency Agricultural Credit Project will be given to farmers and others in the AHV area and to those in the Chapare region who participate in the voluntary eradication program. Finally, a narcotics awareness program dealing with the issues of drug abuse, delinquency, and the overall impact of coca/cocaine production and trafficking on the economy will be developed in both the Chapare and AHV sub-regions, linked to the Mission's Narcotics Awareness Project.

### III. AMENDMENT DESCRIPTION

#### A. Project Goal and Purpose

##### 1. Goal

The Project goal is to stimulate balanced economic development and an enhanced standard of living in the Chapare and the Associated High Valleys regions of Cochabamba through a mixture of public and private sector participation, a diversified economic base, and a more equitable income distribution.

##### 2. Purpose

The Project purpose is to modify and improve the agricultural and forestry systems of farmers in the Chapare and AHV regions of the Department of Cochabamba to respond better to diverse, profitable marketing opportunities under sustained, environmentally compatible, medium technology production models.

##### 3. Discussion

This Project is being carried out to facilitate the transition by Chapare coca farmers and those indirectly involved in illegal coca production (e.g. coca middlemen, transporters, processors, etc.) to legitimate economic activities. It is important to recognize that no single crop, or combination of crops, can provide farmers and others with the income they earn from producing coca for the illegal market. Therefore, the success of the development activities to be undertaken to facilitate this transition to legitimate economic pursuits will be dependent on the success of programs for the control of narcotics production and trafficking. Without effective control programs, farmers will not be attracted to the developmental benefits the Project will offer. Conversely, the existence of potential developmental benefits under the Project will provide an additional inducement to Chapare coca farmers to cooperate with voluntary eradication efforts. Project benefits will be offered only to those individuals and communities in the Chapare that cooperate with GOB eradication efforts, and certificates to this end will be issued after inspections.

The goal and purpose of the Project will be accomplished by **expanding** the Project focus to address the social and economic problems that give rise to migratory pressures in zones of origin of Chapare migrants. If the evaluation of this model of reducing migratory pressures is positive, expansion of this Project may be considered at a later date.

The components of the Project are the means for achieving the Project's target of reducing migratory pressures through expansion of economic opportunities. Because efforts to stimulate some kinds of economic growth could exacerbate migratory pressure, benefits must be seen to be fairly distributed and primarily directed to that part of the population that actually migrates. A series of socioeconomic studies focusing on access to critical productive resources such as land and water, as well as access to the means of commercializing agricultural products will link these factors to migratory trends. The studies will identify specific problems in resource allocation that stimulate migration, and facilitate the design of concrete

activities to address them. In addition, the studies will examine how conditions resulting from the migration itself, such as labor scarcity, constrain the ability of the Project to promote labor-intensive farming practices or public works projects.

The results of the social science studies will assist the Program for Alternative Development in Cochabamba (PADC), the Project's chief implementation agency, in forming a coherent development policy and in identifying specific activities to reduce migratory pressures. This policy will guide the formulation of the technical activities described below, and will provide the criteria for evaluating and supporting the work of other participant institutions.

#### B. Amendment Components

Chart I summarizes the four basic components of the CRDP, the activities which will be developed, and the potential participating institutions. Each component is described briefly below, and in depth in Annex H.

1. Agriculture and Forest Production Component: \$24.1 million (\$4.3 million USAID, \$19.8 million GOB)

The Chapare-based research and extension activities under this Amendment will continue to be carried out mainly by the Bolivian Institute of Agricultural Technology (IBTA/Chapare). This component's activities will, as before, include adaptive research, demonstration farms, nurseries, support for community extension councils, agricultural credit, farmer training, and research facilities/vocational school construction. As mentioned previously, efforts related to plant material production will be expanded and accelerated. New efforts, especially directed to the Associated High Valleys, will be natural resource management, applied research, and extension of technical packages. These technical packages aim at increasing productivity and will be designed and delivered for the AHV by the Improved Potato Seed Service, the Pairumani Crop Technology Institute, the Food Technology Research Center of the "Universidad Mayor de San Simón," and the Tarata Agricultural Technical Institute. The Program for Alternative Development for Cochabamba (PADC), as the former Secretariat for the Development of the Bolivian Tropics (SDBT) is now called under the GOB's reorganized implementation procedures, will coordinate all phases of this work. Agricultural production credit related to these packages will be channelled through the Bolivian Agricultural Bank (BAB) which will be strengthened through Project efforts. (See also Section VI, B. "Implementation Agencies" for descriptions of the participating organizations.) The Project will provide long and short-term TA to the PADC and IBTA/Chapare for the implementation of this component.

2. Rural Industry and Marketing Component: \$3.8 million (\$1.1 million USAID, \$2.7 million GOB)

This component will continue to fund specified agro-industrial and complementary marketing activities in the Chapare, and will be expanded to fund similar activities in the AHV region of Cochabamba Department. Special emphasis will be given to rural industry preinvestment studies and credit. The Project will continue to provide long and short-term TA for the PADC in

a. Rural Industry Pre-Investment Studies

Rural industry offers a means of adding value to local primary products. In this case, rural industry efforts will be integrated with activities in roads improvement, energy production, and credit delivery to multiply impact. Quality control in existing home processing industries such as chicha making and peanut roasting will be a first study. Possible new activities to be assessed are onion drying and the manufacture of tomato paste in the home. A second area for pre-investment study is improvement of natural resource and local talent-based industries. These will include applying quality controls and innovative design to existing industries such as the making of musical instruments (charangos), pottery, and weaving.

b. Marketing Studies

Immediately following the identification of possible value-added rural industries, the existence of markets and the competitiveness of local products will be assessed. The assessment will also consider necessary infrastructural investments in roads, energy and equipment, and the training of local people in manufacturing and business management.

c. Rural Industry Credit

Once pre-investment studies in rural industrial and home food processing activities, plus the associated marketing potential studies, have identified viable investments, then supporting credit arrangements will be made. Parallel to designing these credit programs using presently-available resources, new avenues for bringing credit to individual, corporate, and cooperative entrepreneurs will be explored.

In addition, the Market Town Capital Formation Project (MTCF), implemented in Cochabamba through the CORDECO/UCF, will be a source of rural industrial promotion and credit. Up to \$5,700,000 of investment funding (including reflows from the DDC Project) could be programmed for that purpose. Funding from either MTCF or directly from the CRD Project will be channeled through appropriate Intermediate Credit Institutions (ICI's).

3. Productive, Transport, and Community Infrastructure Component:  
\$9.3 million (\$5.6 million USAID, \$3.7 million GOB)

In the Associated High Valleys, a series of activities will be funded to improve and/or construct productive, transport, and community infrastructure.

Examples of productive infrastructure are the rehabilitation of existing irrigation systems, studies of hydrological and other factors for the design of new irrigation works, implementation of new irrigation systems, and design and extension of improved on-farm water management practices. These will be implemented through various arrangements to be made by the PADC.

The Project will also fund the implementation of improved transport infrastructure in the AHV regions. Upon termination of the Rural Access Roads II Project, the remainder of its undisbursed funds - estimated at

\$2.7 million - will be reobligated to the CRDP for this component of the Project.

The final part of this component will be the funding of community infrastructure. Potable water, rural sanitation, and improvement of existing electrification will be the specific activities in this category.

The Project will also provide the PADC with long and short term technical assistance and training for the implementation of this component.

The infrastructure component for the Chapare Region remains as in the original CRD Project Paper, and is presently being reactivated based on GOB progress in eradication/interdiction activities and on the conditionality discussed in Section III.F.

4. Investment Fund Component: \$3.7 million (\$1.0 million USAID, \$2.7 million GOB)

A significant amount of the Project budget (\$1,042,000 in loan funds and \$2,696,000 in local currency) is earmarked for an Investment Fund. This Fund will permit the PADC to underwrite the work of institutions and communities with successful records in promoting development activities in the target regions, and to coordinate those activities within the framework of a regional development plan intended to reduce migratory pressures. The PADC will receive solicited and unsolicited proposals from PVOs, other institutions, and community groups to conduct specific development projects at the local level. These will be evaluated by the PADC in light of Project goals and objectives. When a project is accepted for funding, the PADC will prepare an implementation agreement specifying the terms of performance, and provide the executing agency with appropriate backstopping through one of the technical support institutions such as the Centro Fitotécnico de Pairumani or Semilla de Papa. The PADC will earlier have entered into indefinite-quantity-contracts with the technical support institutions to ensure their participation in the Project.

In all cases, USAID/Bolivia and the PADC will have responsibility for conducting financial audits and evaluating project results. Through its sub-regional offices, to be located in Mizque and Chapare, the PADC will coordinate the subprojects being carried out to insure that they complement one another within the regional development framework, and to avoid duplication of effort and inter-institutional competition. By building upon the work of institutions already active in the region, the PADC will be able to move quickly into concrete projects that respond to local needs, and to mold these projects to fit the general project goal of reducing migratory pressure. In order to provide the PADC with the flexibility needed to manage the Investment Fund, the disbursement and approved procedures will vary according to the credit amount involved.

To date, the PADC has been approached by several organizations which operate in the Cochabamba Associated High Valleys with proposals for funding the expansion of their efforts in this region. Once this Project

Paper Amendment is approved and the Loan and Grant Amendment are signed, these institutions will be encouraged to develop their proposals more fully.

Based on progress in voluntary eradication, the PADC and USAID/B may decide to include financing of certain Chapare region activities through this Fund.

#### C. Project Beneficiaries

The new Project initiatives proposed by this Amendment will benefit more than 32,000 agricultural producer households located in the target area of the Cochabamba AHV region (160,000 people\*). A large proportion of this population migrates to the Chapare for coca-related purposes for part of every year, although the migrants usually continue to hold land and to produce in their areas of origin also.

The AHV beneficiaries fall into two groups. Fourteen thousand families\* residing in the Southern District and Tarata in Cochabamba Department (Provinces of Campero, Mizque and Esteban Arce) comprise the first group. At least 7,000 of these 14,000 families are expected to give up dedicating the larger part of their time to coca production in the Chapare. The rest are residents of the AHV area who will not begin Chapare migration patterns because of the improved local economy. These people will receive all the benefits provided by the Project in terms of financing of irrigation projects, credit, roads, agricultural technical assistance, and community infrastructure works. The second group is composed of families who will be employed as laborers as a result of the jobs created by activities financed by the Project. Considering that the number of labor/days required by typical agricultural activities per hectare could increase by 44 and 152 for rainfed and irrigated plots, respectively, the financing of irrigation systems for 5,000 hectares of land will provide employment for about 2,500 households (12,500 persons).

The Project will additionally benefit directly up to 15,600 agricultural producer households who reside in the area of influence of the Cliza-Punata-Arani-Rodeo road to be improved by the Project. The financing of this infrastructure work will reduce transportation costs and therefore increase profit rates for agricultural goods marketed by the above residents.

#### D. Project Administration

##### 1. General

As in the earlier part of the Project, the key administrative role will be held by the PADC. However, the Project has, as a result of recently issued Supreme Decree No. 21660, been transferred from the Ministry of Planning and Coordination (MPC) to the Ministry of Agriculture and Campesino

\* Average family size in the AHV is estimated at 5 people. This is higher than the Chapare average (3.5 people per household) used earlier, because the two areas have different demographic structures. The Chapare is a younger population with many "workers only" migrant households, while the AHV is an older population, with more complete families.

Affairs (MACA) under the direction of a newly created "Sub-Secretary for Alternative Development and Coca Crop Substitution" (SSADCCS).

To assist the MACA/SSADCCS in carrying out this responsibility, an Interministerial Committee made up of Ministers from the Departments of Agriculture and Campesino Affairs, Finance, Interior, Defense, Foreign Affairs, Planning and Coordination, Health, Industry and Commerce, Education and Transportation will be formed. Each of these Ministries has an involvement in the amended Chapare Regional Development Program. The presence of the Ministry of Interior will strengthen the linkage between the coca control and economic development programs at the highest administrative levels. The Committee will advise the PADC on broad policy issues. The MACA/SSADCCS and USAID/Bolivia will also provide guidance to the PADC, approve operating plans and Project activity budgets, and review the progress of development activities. The MACA/SSADCCS will receive Project financial support from grant, loan, and PL 480 funds.

In connection with the above, the PADC will report directly to the Sub-secretary of SSADCCS, and will be responsible for overseeing the implementation of Project activities approved by the Sub-secretary and Interministerial Committee. It will prepare Annual Master Operating Plans and Budgets, in coordination with each of the executing agencies, for presentation to the Sub-secretary and USAID for approval. All implementing agencies, to the extent possible, will submit their operating plans and budgets to the PADC by November 1 of each year. This will allow sufficient time for review, modification if necessary, and inclusion in the PADC Annual Master Operating Plan for CRDP implementation. This Plan should be submitted for approval by December 15 of each year. Each executing agency will be accountable for keeping current its own portion of the counterpart contribution under the current pari passu disbursement system. The PADC also will be charged with coordinating all Project-funded procurement, including development of technical assistance terms of reference, commodity bidding documents, and contracts. These tasks will be carried out in close cooperation with the executing agencies requiring such procurements. Further, the PADC will have overall responsibility for coordinating Project evaluation activities.

USAID will provide comprehensive management of CRDP implementation. A Project Officer and Project Coordinator will be based in La Paz with frequent travel to Project areas. Assistant Project Coordinators, under the PADC, will be based in the city of Cochabamba and will coordinate all CRDP matters and travel frequently to Project areas.

The organizational structure of all other Project entities, including IBTA/Chapare, SNC, CORDECO, and FENACRE, will remain basically as before, with modest changes as described in the amended Project Paper.

## 2. Chapare Region

The PADC will continue to have the major role of coordinating the research and extension as well as the credit activities that take place in the Chapare region.

These will be carried out by IBTA/Chapare and the banking system

located in the Chapare respectively. To this end, the PADC will establish a decentralized office with adequate technical, administrative, and support staff in the Chapare.

IBTA/Chapare will be in charge of all agricultural research, genetic material production, and extension activities in the Chapare. It will submit its Operating Plan (OP) and Budget annually to the PACD for review and approval. The OP will provide a detailed description of the activities which IBTA intends to carry out during the year, indicating the specific objectives, projected outputs and targets to be achieved. The budget and OP will be presented for review to the PADC, and if approved, subsequently to the sub-secretary of the MACA/SSADCCS and USAID as part of the PADC Annual Master Plan. USAID will approve the Master Plan by means of an Implementation Letter and then will proceed to disburse the amounts approved in the budget on a quarterly basis.

In order to ensure that the implementation of activities by IBTA is taking place as described and scheduled in the OP and budget, PADC will monitor IBTA activities closely. Should this institution need to change the target benchmarks set up in the OP, it will need to get the approval of the PADC and USAID Project Management. All IBTA financing and procurement requests (i.e. operating expenses disbursements, training of personnel, purchase of goods) will be addressed to the PADC.

The PADC will also be in charge of coordinating Project-sponsored credit activities in the Chapare with local private and public banks (i.e. Banco Agrícola de Bolivia, Banco de Cochabamba, and BIG Beni). The PADC will present to USAID and SSADCCS, within 60 days after the signature of this Amendment, a proposal for credit procedures, policies, and eligibility evaluation criteria which will define the system to be used in the Project for channeling credit resources in the Chapare and the High Valleys. This document, to be approved by means of an Implementation Letter, will define the roles of USAID, PADC, the ICI's, and PL 480 in the credit delivery process. All credit granted in the Chapare will be based on certificates that the beneficiary person and community are not significantly involved in coca-growing or related activities. The PADC will also coordinate implementation of all Chapare infrastructure activities with the SNC and other organizations.

### 3. Associated High Valleys

The PADC will be strengthened and decentralized to meet the expanded requirements of the CRDP (i.e. the extension of activities to the High Valleys.) The Institutional Analysis (Section V.B.) provides in-depth treatment of the major organizational issues involved.

The PADC's first task related to the AHV region will be to prioritize Project activities for the area and to negotiate agreements with local institutions to carry out the prioritized activities.

The PADC must ensure effective integration of the immediate and medium-term activities of the Project. The studies to be carried out under the four component parts of the CRDP should be based on and closely related

to, the immediate activities which emerge from the institutional agreements. The areas of activity for immediate subprojects are: reforestation and soil and water management activities to be implemented in the Vacas area, the upper reaches of the Mizque watershed; the construction of two forestry nurseries to support reforestation efforts in the southern district; and the construction of flood control structures to protect parts of the towns of Mizque and Omereque. In addition, special activities to improve agricultural production may be implemented immediately, for instance the improvement of potato seed, addressing several major technical constraints to the production of cereals and vegetable crops, improving pasture and forage production, and the introduction of integrated pest management techniques to reduce crop losses.

Parallel to the signing of the institutional agreements, the PADC will contract with competent technical institutions identified in Section VI-C, to carry out studies designed to focus subsequent medium-term activities in the Associated High Valleys. This combination of practical experience with research and design exercises will permit the PADC and USAID/Bolivia to evaluate, and possibly officially propose, an expanded focus for the Project in FY 89.

As in the case of the Chapare, the PADC will establish a decentralized office for the AHV effort, based in Mizque and staffed with technical, administration, and support personnel.

#### E. Amendment Conditionality

In relation to the Chapare, implementation of any project activities other than agricultural research and extension, completion of the three current agro-industrial projects, and trunk road maintenance will be directly linked to verifiable progress in elimination of coca cultivation. Specifically, agricultural credit will be extended only to members of communities participating in the eradication program and will require that each individual recipient of credit a) belong to a community holding a certificate from Dirección de Reconversión Agrícola of the Ministry of Agriculture (DIRECO/MACA) verifying that the community is participating significantly (at least 70% eradication) in voluntary reduction of coca production or is not producing coca and b) hold, him or herself, a certificate from DIRECO certifying that at least seventy percent of his/her farm's hectares planted in coca have been eradicated or that the farm does not produce coca. Further, commitment of funding for community infrastructure activities, including the improvement of secondary roads, water supply and sanitation systems will only be made on a proof-of-eradication basis. Funds for these activities will be released upon receipt of a written declaration from each recipient community that the community's members have eradicated at least 70% of the coca under cultivation within the community at the time of crop destruction and a verification from DIRECO that such is the case.

In regard to development activities in the Associated High Valleys, assistance will begin immediately on the signing of the Amendment to the Project Agreement based on this Project Paper Amendment. These development efforts are not tied to the conditionality which obtains for Chapare development activities.

IV. LIFE OF PROJECT REVISED FINANCIAL PLAN AND COST ESTIMATES

Upon approval of this Amendment, the CRD Project will become a \$72.3 million effort, with USAID contributing \$26.5 million, the GOB \$34.8 million, and beneficiaries \$11 million. Of the USAID monies, \$16.9 million were previously obligated, of which \$12.372 million are reprogrammed for the amended effort. An additional \$5.75 million in new grant funds is authorized, and \$3.85 million in loan monies de-obligated from other USAID projects is reobligated to CRDP as grant funds.

The GOB, which previously agreed to provide \$4.1 million from PL 480 and \$822,000 from the National Treasury, will raise its contribution to \$32 million from PL 480 (including \$17.5 million in Emergency Agricultural Credit Project reflows) and \$2.8 million from its direct accounts. The GOB contribution thus rises to \$34.8 million over the 8-year amended Project life.

Project beneficiaries will provide \$11,000,000 to the Project largely in in-kind contributions. These monies are not included in the overall Project budget charts, except as footnotes, because their apportionment will only be worked out as specific component activities are designed.

The following Tables I - III detail Project Financial Inputs, Disbursement, and Financing Procedures.

A. AID Contribution (Tables I and II)

An additional \$9.6 million in grant funds will be provided by AID of which \$1.15 million will be reobligated to this Project from the Disaster Recovery Project (511-0581) and \$2.7 million from the Rural Access Roads II Project (511-0466), and \$5.75 million are new funds to be provided in FY-89, 90, and 91.

Under the previous grant budget of \$4.4 million, a total of \$2.26 million is being reprogrammed and of the previous loan budget of \$12.5 million, the majority of funds (\$10.052 million) are also being reprogrammed. Therefore, the total AID contribution to this Project (i.e. grant & loan, previous budget plus this amendment) is \$26.5 million as further detailed in the Life of the Project Revised Summary Cost Estimates and Financial Plan shown in Table I\*. The reprogrammed funds under grant and loan (\$12.312 million) plus this Amendment's additional grant funds (\$9.6 million) will be used as detailed in Annex F.III.

B. Host Country Contribution (Tables I and II)

A total of \$29,800,000 will be furnished by the GOB under this amendment, of which \$27,881,000 will come from PL-480 and \$1,925,000 from the GOB Treasury. Under the previous PL 480 budget of \$4,119,000, a total of \$3,554,000 is being reprogrammed. \$397,000 of the GOB Treasury's previous budget of \$822,000, is being reprogrammed.

\* Figures in this table have been rounded and therefore may not correspond exactly to those in the detailed cost analysis by Project elements and by financing sources.

TABLE I: LIFE OF PROJECT REVISED SUMMARY COST ESTIMATES AND FINANCIAL PLAN (IN US\$ 000'S)

PROJECT ELEMENTS	FINANCING SOURCES																														
	A I D								HOST COUNTRY																						
	G R A N T				L O A N				P L 480				G O B T R E A S U R Y																		
	Previous Budget		Previous Budget		Previous Budget		Previous Budget		Previous Budget		Previous Budget		Previous Budget		Previous Budget		Previous Budget														
Accrued(1) Expenditures		Reprogrammed Funds(2)		This Amendment(2)		New Total		Accrued Expenditures		Reprogrammed Funds		New Total		Accrued Expendts		Reprog'd Funds		This(3) Amendnt		New Total		Accrued Expendts		Reprog'd Funds		This Amendnt		New Total		Grant Totals	
FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	FX	LC		
<b>I. AGRICULTURE AND FORESTRY PRODUCTION</b>																															
A. Chapare Dev. Activities					100	475	100	475	119	270	762	1,565	900	1,835	148	465	11,000	11,613	-	-	-	0	-	-	-	0	1,682	13,923			
B. High Valley Activities							0	0			200	505	380	505	-	-	8,180	8,180	-	-	-	0	-	-	-	0	380	8,685			
<b>II. RURAL INDUSTRY AND MARKETING</b>																															
A. Chapare	232	-	8	-	-	-	240	0	-	14	640	-	640	14	417	353	-	810	-	-	-	0	-	-	-	0	880	824			
B. High Valleys	-	-	-	-	-	-	0	0	-	-	150	-	150	0	-	-	1,900	1,900	-	-	-	0	-	-	-	0	150	1,900			
<b>III. PRODUCTIVE, TRANSPORT &amp; COMM. INFRASTRUCTURE</b>																															
A. Chapare	-	-	-	-	-	-	0	0	11	-	41	-	52	0	-	-	200	200	-	-	-	0	-	-	-	0	52	200			
B. High Valleys	-	-	-	-	1,500	3,400	1,500	3,400	-	-	649	-	649	0	-	-	3,541	3,541	-	-	-	0	-	-	-	0	2,149	5,541			
<b>IV. INVESTMENT FUND</b>																															
	-	-	-	-	-	-	0	0	-	-	521	521	521	521	-	2,696	-	2,696	-	-	-	0	-	-	-	0	521	3,217			
<b>V. IMP. PLANNING &amp; STUDIES</b>																															
	81	-	25	-	-	-	116	0	-	63	2	23	2	86	-	-	-	0	-	-	-	0	-	-	-	0	119	86			
<b>VI. INSTITUTION BUILDING</b>																															
A. PADC	129	-	800	-	1,630	-	2,559	0	511	164	844	1,203	1,355	1,317	-	-	-	0	68	126	26	218	-	-	-	0	3,914	1,585			
B. IBTA	1,671	-	797	-	1,252	-	3,720	0	467	647	544	1,246	1,011	1,693	-	-	-	0	159	371	299	929	-	-	-	0	4,731	3,822			
C. SAC	-	-	-	-	150	63	150	63	-	-	-	-	0	0	-	-	-	0	-	-	1,600	1,600	-	-	-	0	150	1,652			
D. MACA/ESABDCS	-	-	-	-	100	-	100	0	-	-	150	-	150	0	-	-	2,200	2,200	-	-	-	0	-	-	-	0	250	2,100			
E. Project Management	27	-	500	-	300	-	927	0	-	-	-	-	0	0	-	-	-	0	-	-	-	0	-	-	-	0	827	0			
<b>VII. EVALUATIONS AND AUDITS</b>																															
	-	-	-	-	140	-	140	0	52	-	-	-	52	0	-	-	-	0	-	-	-	0	-	-	-	0	150	0			
<b>VIII. PRICE/QUANTITY CONTINGENCIES</b>																															
	-	-	120	-	277	213	397	213	49	-	160	145	209	145	-	-	660	660	-	-	-	0	-	-	-	0	606	1,215			
<b>T O T A L :</b>	2,140	0	2,260	0	5,449	4,131	9,849	4,151	1,290	1,159	4,844	5,209	6,134	6,166	562	3,554	27,691	32,600	425	397	1,925	2,747	-	-	-	0	15,993	45,164			
			4,400		9,600 (4)		14,000		2,449		10,052		12,100		4,115		31,425 (reprogrammed)		922		2,322 (reprogrammed)						61,247				

(1) As of June 30, 1987.

(2) Estimated cost from 7/1/87 to 6/30/91(50 months).

(3) Includes \$17.5 million from project reflows &amp; \$10.381 from new PL 480 funds.

(4) Includes \$1.15 reallocated from Disaster Recovery and \$2.7 million reallocated from Rural Access Roads II &amp; \$5.75 in FY 89/90/91 Grant Funds.

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C. Summary Disbursement Schedule (for remaining LOP)

TABLE II  
SUMMARY DISBURSEMENT SCHEDULE  
(in 3000's)

A I D GRANT	1987		1988		1989		1990		1991		TOTAL	
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC
I. <u>Agriculture and Forestry Production</u>												
A. <u>Chapare Development Activities</u>	10	50	20	120	25	130	25	130	20	45	100	475
B. <u>High Valleys Activities</u>												
II. <u>Rural Industry and Marketing</u>												
A. <u>Chapare</u>	8	-	-	-	-	-	-	-	-	-	8	-
B. <u>High Valleys</u>	-	-	-	-	-	-	-	-	-	-	-	-
III. <u>Productive, Transport &amp; Community Infrastructure</u>												
A. <u>Chapare</u>	-	-	-	-	-	-	-	-	-	-	-	-
B. <u>High Valleys</u>	-	-	500	800	500	1,100	400	1,100	100	400	1,500	3,400
V. <u>Implementation Planning Studies</u>												
A. <u>Chapare</u>	-	-	35	-	-	-	-	-	-	-	35	-
VI. <u>Institutional Building</u>												
A. <u>PALC</u>	250	-	900	-	900	-	280	-	100	-	2,430	-
B. <u>IBTA/Chapare</u>	250	-	1,000	-	500	-	200	-	99	-	2,049	-
C. <u>SNC</u>	-	-	60	25	60	26	30	12	-	-	150	63
D. <u>HACA/SSADCCS</u>	-	-	30	-	30	-	30	-	10	-	100	-
E. <u>Project Management</u>	90	-	190	-	190	-	190	-	140	-	800	-
VII. <u>Evaluations/Audits</u>	-	-	-	-	70	-	-	-	70	-	140	-
VIII. <u>Contingencies</u>	30	10	35	45	105	62	58	58	69	38	397	213
TOTALS	638	60	2,870	990	2,380	1,318	1,213	1,300	608	483	7,709	4,131
												11,860

AID LOAN

I. <u>Agriculture and Forestry Production</u>												
A. <u>Chapare Development Activities</u>	100	200	180	380	180	380	180	380	123	225	763	1,565
B. <u>High Valleys Activities</u>	50	100	100	200	100	100	100	50	30	5	380	505
II. <u>Rural Industry and Marketing</u>												
A. <u>Chapare</u>	100	-	300	-	240	-	-	-	-	-	640	-
B. <u>High Valleys</u>	25	-	50	-	50	-	25	-	-	-	150	-
III. <u>Productive, Transport &amp; Community Infrastructure</u>												
A. <u>Chapare</u>	41	-	-	-	-	-	-	-	-	-	41	-
B. <u>High Valleys</u>	100	-	200	-	200	-	100	-	49	-	649	-
IV. <u>Investment Fund</u>	50	50	150	100	150	200	100	100	71	71	521	521
V. <u>Implementation Planning Studies</u>												
A. <u>Chapare</u>	-	-	2	23	-	-	-	-	-	-	2	23
VI. <u>Institutional Building</u>												
A. <u>PALC</u>	100	150	230	300	200	300	200	300	144	153	844	1,203
B. <u>IBTA/Chapare</u>	50	150	130	300	130	300	130	300	104	196	544	1,246
D. <u>HACA/SSADCCS</u>	20	-	100	-	30	-	-	-	-	-	150	-
VII. <u>Contingencies</u>	22	20	48	40	40	38	25	35	25	12	160	145
TOTALS	658	670	1,460	1,343	1,320	1,318	860	1,165	546	312	4,822	5,208
												\$10,052

G O B - TREASURY

I. <u>Institutional Building</u>												
A. <u>PALC</u>	-	20	-	40	-	40	-	30	-	22	-	152
B. <u>IBTA/Chapare</u>	-	80	-	150	-	150	-	100	-	90	-	570
C. <u>SNC</u>	-	-	-	500	-	500	-	400	-	200	-	1,600
TOTALS	-	100	-	690	-	690	-	530	-	312	-	2,322

PL 480, FIE, CAI

I. <u>Agriculture and Forestry Production</u>												
A. <u>Chapare Development Activities</u>	-	100	-	3,500	-	3,500	-	3,500	-	865	-	11,465
B. <u>High Valleys Activities</u>	-	100	-	2,500	-	2,500	-	2,000	-	1,080	-	8,180
II. <u>Rural Industry and Marketing</u>												
A. <u>Chapare</u>	-	150	-	200	-	20	-	10	-	13	-	393
B. <u>High Valleys</u>	-	100	-	600	-	600	-	500	-	100	-	1,900
III. <u>Productive, Transport &amp; Community Infrastructure</u>												
A. <u>Chapare</u>	-	450	-	1,000	-	1,000	-	1,000	-	291	-	3,741
B. <u>High Valleys</u>	-	200	-	800	-	800	-	600	-	296	-	2,696
VI. <u>Institutional Building</u>												
C. <u>HACA/SSADCCS</u>	-	100	-	600	-	500	-	500	-	500	-	2,200
VIII. <u>Contingencies</u>	-	60	-	200	-	200	-	200	-	200	-	860
TOTALS	-	1,260	-	9,400	-	9,120	-	8,310	-	3,345	-	31,435

D. Financing Procedures

TABLE III  
Financing Procedures Chart  
(reprogrammed and new AID funds)

<u>Major Elements</u>	<u>Method of Implementation</u>	<u>Method of Payment</u>	<u>Approximate Amounts</u>		<u>TOTAL</u>
			<u>Reprogrammed Funds</u>	<u>This Amendment</u>	
I. <u>Agriculture &amp; Forestry Production</u>	Host Country Contracts (HCCs)	Direct Reimbursement	1,265	500	1,765
	Direct AID Contracts	Direct Pay	505	75	580
	HCC Interinstitutional Agreement	Direct Reimb.	1,443		1,443
II. <u>Rural Industry &amp; Marketing</u>	Direct AID Contract	Direct L/Com	648	-	648
	Direct AID Contracts	Direct Pay	110	-	110
	HCCs	Direct Reimb.	40	-	40
III. <u>Productive, Transport &amp; Community Infrastructure</u>	Direct AID Contracts	Direct Pay	41	-	41
	Direct AID Contracts	Direct Pay	100	940	1,040
	HCCs	Direct Reimb.	549	3,960	4,509
IV. <u>Investment Fund</u>	Direct AID Contracts	Direct Pay	258	-	258
	HCCs	Direct Reimb.	167	-	167
	Inter Institutional Agreement	Direct Reimb.	617	-	617
V. <u>Imp. Planning &amp; Studies</u>	Direct AID Contracts	Direct Pay	30	-	30
	Inter Institutional Agreement	Direct Reimb.	30	-	30
VI. <u>Inst. Building</u>	Direct AID Contracts	Direct Pay	3,102	3,056	6,158
	HCCs	Direct Reimb.	2,982	439	3,421
VII. <u>Evaluations/Audits</u>	Direct AID Contracts	Direct Pay	-	100	100
	HCCs	Direct Reimb.	-	40	40
	Sub-totals		\$11,887	\$9,110	\$20,997
	Price/Quantity Contingencies		425	490	915
	TOTALS		\$12,312	\$9,600	\$21,912

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E. Flow of Funds to Implementing Agencies

1. PADC

PADC will manage most US Grant and Loan funds for the Project. However, the grant funds to finance both long-term and short-term technical assistance will be managed directly by AID, as will loan funds for purchase of some items (e.g. vehicles). The PADC will receive AID loan and grant special account funds as well as local currency directed to other organizations, and will be responsible to AID for the proper use of the financing.

2. IBTA/Chapare

IBTA/Chapare will receive grant funded technical assistance as well as loan support. All grant funds will be disbursed directly by A.I.D. to the contractor. Under the loan, two types of disbursement flows to IBTA will obtain: (1) direct payments from A.I.D. to IBTA suppliers and (2) payments in local currency from A.I.D. to IBTA/Chapare for the costs of construction, operating support, in-country training, and the procurement of miscellaneous inputs.

F. Project Accounting and Disbursing System

The disbursing system referred to as the pari-passu system has been successfully used to date in the Project, and will continue to be used. The system provides for advances of A.I.D. Project and GOB counterpart local currency funds on a quarterly basis to two special project bank accounts. The implementing agencies are responsible for disbursing funds from the special accounts in accordance with procedures already developed. USAID/Bolivia dollar payments for foreign technical assistance and commodity procurement are not made through the special accounts but directly to the suppliers of the commodities and services. In order to implement the Project, USAID/Bolivia, the MACA/SSDACCS, PADC, the implementing agencies, IBTA, the PL 480 Executive Secretariat and the Ministry of Finance (MOF) will agree on detailed budgets for counterpart contributions.

Under the pari-passu system, participating entities prepare an estimated budget for each three-month period in advance and simultaneously submit reports on the use of funds already advanced. USAID/Bolivia's disbursement of funds for each quarter to the Project's special accounts is contingent upon the MOF's disbursement of funds to the counterpart special account during the quarter, for use by GOB agencies. If GOB funds are not deposited in a timely manner in the amounts agreed upon as required by MACA/SSDACCS and the PADC, USAID/Bolivia will withhold further disbursements to the organization that is behind schedule in its contributions until the contributions are brought up to date. This disbursement system is intended to improve administration of Project funds by shifting more Project implementation responsibility to the GOB, retaining adequate USAID/Bolivia control without the necessity of prior review of every transaction. It also helps ensure that counterpart funds are made available in the amounts required when needed and it provides a more systematic means of monitoring Project implementation. The PADC and the MACA/SSDACCS will maintain separate accounting books and records for the Project.

## V. PROJECT ANALYSES

The analyses contained in this section complement those done for the Project Paper prepared in May 1983, adding information specifically for the new Associated High Valleys (AHV) activities. As three analyses are exceedingly lengthy (Technical, Institutional, and Social), only summaries of them are included here. The Annexes contain the full analyses.

### A. Technical Analysis

#### Overview

As stated earlier, the goal of the activities in the AHV areas is to promote sustained economic and social development in the region in order to decrease migratory pressures on the existing population and create the probability of return migration by some of those who have already moved to the Chapare. The complete range of potential development sectors and their corresponding constraints and possibilities were considered during the design of AHV activities. These included: agriculture, industry, tourism, mining, energy, infrastructure, health, and education. The keys to those areas selected for Project attention are 1) strengthening rural areas in production and productivity and 2) upgrading activities in secondary urban centers in agricultural processing, marketing, and such other urban functions as are linked to increased production in rural areas.

The following factors were considered of major importance in defining the technical options for AHV project activities: 1) the overwhelming involvement of the AHV population in agriculture and livestock raising; 2) the rural and dispersed nature of AHV settlements; 3) the physical capacity of much of the land in the AHV areas for agriculture, livestock raising, and forestry; 4) the region's serious infrastructure deficiencies in transport, irrigation, agro-industry and community services, and 5) the rapid degradation of the natural resource base in the AHV. The discussion below indicates the technical bases for work in the development areas chosen and the technical support for the various options recommended. Sub-project-specific technical analyses for all medium-term activities will be prepared as part of the pre-implementation studies to be carried out under the Project. The principal Project activity areas are: natural resource management; agricultural production and credit; and irrigation, transport, and community infrastructure.

### 2. Agriculture and Forest Production Component

#### a. Natural Resource Considerations

The high valleys area of the project zone offers a complex environmental scenario. Many of the area's components (i.e., bio-geological, hydrological elements) are largely unknown. Even less well known are some of the interdependencies between human activities and the natural resource and ecosystem processes. However, while the actual processes may be hard to trace, the observable results of ecosystem and human interactions are the degradation of the affected ecosystems, including the loss of biological diversity and of life supporting systems (i.e. hydrological, nutrient cycles).

Because the demand for forest products in the high valleys area is increasing while the local resource base is being depleted, there is an immediate need to introduce and/or exploit rapid growth reforestation products adapted to the AHV environment, such as pines and eucalyptus. Presently only COTESU-CORDECO (see Section VI.C. "Implementation Agencies") is capable of executing reforestation projects in the AHV region. Within the project area, their long-term plans include the establishment of pine and eucalyptus forests in the uppermost reaches of the Tucma-Uyuchama watershed (which directly supplies water for the Mizque region) and in the Vacas region (540 hectares over three years). This reforestation effort will provide wood products while having a positive effect on soil erosion and the regulation of the hydrologic cycle in the Uyuchama-Tucma watershed.

Extensive areas of xerophytic forest in the Aiquile-Mizque region could become important and reliable sources of forest products in support of small artisanal activities. The Advanced Forestry Technical School (Section VI.C.) will carry out inventories and develop management plans aimed at establishing the areas of greatest productivity.

Another environmental problem the Project will address is over-grazing by cattle, goats, and sheep on the slopes and high-altitude pastures within the project area. Livestock pressure in many areas has exceeded the carrying capacity of the resource base and caused reduction of its productive capacity through the loss of top soil, the degradation of forest lands, the reduction of ground cover density and the change in its composition. The research project COTESU-CORDECO will search for answers to the problems of overgrazing, and will supply appropriate technological packages for improving the traditional systems of livestock management under the Project. Since women and children left behind by male migrants can more easily manage herds than extensive croplands, out-migration of male farmers has exacerbated the overgrazing problem. Studies and development proposals will keep this gender-age phenomenon in mind, as well as the project goal of retaining residents who might otherwise migrate.

As much of the development potential of the high valleys depends upon the use of water for irrigation and more specifically, upon the regular flow of water in area streams used for irrigation, a key element of the development strategy is the proper management of the water catchment area above the irrigated area. The research/extension component of the High Valleys project area therefore includes a series of pre-investment studies involving the detailed study of water quality and sediment loads (scale 1:20,000) in three selected watersheds of the region: (1) the Tucma-Uyuchama watershed (70,000ha); (2) the Tipa Tipa watershed (4,000 has); and (3) the Calicanto watershed (5,000 ha). These watersheds have a relevance to future activities of the project as they feed already functioning irrigation systems and are expected to provide water for expanded irrigation systems in the future.

The objectives of the environmental subcomponent of the project are to: 1) acquire basic knowledge of the elements and processes under traditional resource utilization practices which have a negative impact upon the environment; 2) develop intervention mechanisms (management practices) which reduce environmental degradation and restore the productivity of natural areas; and 3) develop management systems which protect the remaining biological diversity and possibly reclaim degraded habitats and areas of local endemism. Specific environmental studies will lead to the Project strategy for watershed management and to specific subprojects. The latter studies will include new impact analyses, which will be submitted to the REA/Lima and the AID/W Environmental Officer for Latin America for approval prior to project implementation.

A final aspect of this part of the Project is the strengthening of the only specialized natural resource management institution in the region, Escuela Técnica Superior Forestal (ETSFOR) of Cochabamba, especially in its effort to train mid-level technicians. Project support will allow ETFOR to orient teaching and research efforts towards improved management of the resources of the highland region, the inter-Andean valleys and the high-altitude pastures, and will further strengthen the training capacity of the school by supporting a new agro-forestry program.

#### b. Agricultural Production and Credit Considerations

##### (1) Agricultural Production

The most intractable constraint in agricultural production in the target area is lack of water. Therefore, the crucial component of AHV agricultural activities will be the PADC effort to increase rainfed and irrigated agricultural production.

Rainfall is less than 500 mm per year and evapotranspiration exceeds precipitation during more than half of the months of the year over much of the high valleys region. Research has shown that, despite the limitation imposed by water scarcity, it will be possible to achieve significant increases in production using known technologies and acceptable levels of investment per hectare/person. A thorough analysis of surface and groundwater resources will be made and a master water plan designed to achieve optimum use of the available water resources. Improved system design will allow rehabilitation of salinated areas and more efficient use of water elsewhere. The employment of very small gravity fed sprinkler irrigation systems will be explored by the PADC to further extend the area irrigated and the number of farmers benefitted.

Despite the water scarcity problem in the AHV area, the region has many natural advantages. Its average elevation above sea level of 2,000 meters allows a wide variety of both temperate and tropical crops to be grown. Evapotranspiration is relatively less than at lower elevations with the same rainfall. Pest and disease problems are relatively less severe than in the lowland humid tropics. Farmers in the region are capable of obtaining excellent yields in such crops as tomatoes and onions. Given adequate

information and convincing on-farm demonstrations, plus help with irrigation, crop choice, credit and marketing, local farmers should be able to improve both production and productivity, and therefore their standard of living during the Project's life.

(2) Credit

A major goal of the project is to make credit available to the Project's target groups in order to promote improved production systems and investment in agro-processing activities. The difficulty has been to find or design a mechanism whereby credits can be disbursed to producers in a timely fashion and without excessive cost.

Unfortunately, the only financial institution presently dispensing credit in the Southern District (Campero/Mizque) is the Banco Agrícola de Bolivia (BAB), a state institution which has suffered from numerous and widely reported management/financial problems. However, there is presently strong political interest at the GOB level in rehabilitating the BAB. In July 1987 the GOB issued Supreme Decree 21660, authorizing the restructuring of the Bank, specifying key steps to be taken in the next six months. The Mission believes that the implementation of these policies, and close follow-up by AID staff, will permit the BAB to become a strong and well managed credit institution, serving the Project area. It is unlikely the Project could interest other credit institutions in entering the Project area under present conditions and there is no reason to set up a new credit network - - given the very probable rehabilitation of the BAB within an acceptable time frame.

The PADC will collaborate with those agencies of the Banco Agrícola de Bolivia (BAB) working in Project areas (i.e. associated high valleys and the Chapare) to establish a program for distribution, supervision, and recovery of the agricultural production credit to be administered through the CRDP. Besides establishing the general and specific procedures for credit management, the PADC will arrange any technical assistance necessary to strengthen the capacity of the BAB to implement this Project component, particularly technical assistance and/or training in credit management and agricultural credit evaluation. The PADC will also analyze and, to the extent judged necessary, provide funding for logistical support to BAB agencies in order for them to manage Project credit correctly. In establishing the Bank's (or other organization's) credit program, consideration will be given to building operational and personnel costs into the interest rate spread. Credit eligibility criteria will be established in collaboration with the PADC. Interest rates, terms, collateral rules, and commissions will coincide with those established for agricultural credit lines under the PL-480 Program and will be approved by the PADC and USAID. The BAB and PADC will maximize collaboration with agricultural producer associations for credit management, along the general lines established by other PL-480 agricultural credit programs.

## 2. Rural Industry and Marketing Component

The objectives of the rural industry component are to: 1) add value to locally produced or available agricultural, forest and mineral products; 2) create additional employment over a longer period of the year; 3) create products that can be stored and thus are less vulnerable to seasonal market gluts affecting fresh produce; and 4) create products for local consumption by a population with increased income.

Identification of priority projects is an iterative process involving determination both of where improvements in agricultural production and forest management can be made, as well as the competitiveness of potential processed or industrialized products made from the local raw materials in the regional, national, and even international market place.

The rural industry strategy is to: 1) find those processed products which are currently produced and could be improved and their production expanded through improved technology and effective marketing; 2) find crops produced for the fresh produce market or for subsistence that could be processed with resultant added value; and 3) identify new crops which could be planted in the region to provide raw material for industrialization. Credit will be provided to qualifying sub-projects; that is, to those that fit the strategy.

Examples of small, profitable industries where the requisite raw material and energy resources are available in the area include: 1) chicha production where improvements can be made in quality control, bottling, and marketing; 2) peanut marketing through improved post harvest handling and processing; 3) production of musical instruments and furniture by assuring wood supply through improved forest management and wider marketing, and 4) ceramic production around Aiquile and Tarata through better use of appropriate clays and constant supplies of fuels (wood or crude oil) leading to production of a highly versatile range of products including tiles, bricks and pipe, decorative and utilitarian pottery, art works, and a wide variety of specialty products such as junction boxes, crucibles and other high refractory items. Assessing potential benefits from processing primary materials now produced in the area will be a high priority for the pre-investment studies planned.

## 3. Production and Transport Infrastructure Component

Irrigated agriculture, potable water, and electrification will be the major emphases under Production Infrastructure, while rural roads will be the main focus of the Transport Infrastructure efforts.

Irrigated agriculture efforts in the AHV will have five basic objectives:

- (1) Creation of new employment; irrigated lands use a larger labor input.
- (2) Increase in farm labor per-hour remuneration as a result of the higher net production levels.
- (3) Contribution to a more equitable distribution of income in the region.
- (4) Reduction and/or transfer to the irrigated areas of the animal load on the upland grazing areas; and
- (5) Avoidance of excessive salinization and alkalization of the irrigated areas.

The attainment of these objectives is constrained by several factors, which will be addressed by the Project:

- 1) Scarcity of available water;
- 2) Limited infrastructure to distribute irrigation water;
- 3) Deficient farmer training in sustained yield management of improved irrigation infrastructure; and
- 4) A very low level of farm knowledge of potential (new) crops to be cultivated at the different zonal altitude levels.

Irrigation water in the AHV region comes from surface runoff water, pumped ground water, and stored dam water. It serves different purposes, including: (1) replacement of absent rainfall during the dry spells of the rainy season; (2) reinforcement of deficient rainfall during the entire rainy season in the drier valleys; (3) preplowing irrigation (between June and September) for normally rainfed crops; and (4) dry season irrigation of dry season and perennial crops.

Due to the scarcity of irrigation water in the Southern part of the department, irrigation development as a rule will be concentrated on the flatter soils where erosion caused by irrigation will be of little importance. Where irrigation may occasionally be developed on sloping land, a program of soil conservation will be carried out to avoid washing away the usually non or slightly cohesive soils.

Full scale construction of the potentially planned irrigated agriculture in the AHV regions could provide permanent work and income for some 25,000 families. However, if full construction occurs, the increased production may create an unprecedented burden on the Cochabamba regional market, which surplus should be channeled into agro-industry, as described elsewhere. Also, it is possible that unemployed mine workers from the Altiplano will migrate to the region to take advantage of the jobs created, causing stress in the project area as they displace local labor. Therefore, social and production developments will be carefully monitored and guided into an inter-related development plan.

Estimated costs for the proposed irrigation works are, \$700/hectare for improved irrigation systems, \$1,500/hectare for newly irrigated land.

(2) Potable Water

There is almost no piped domestic water in the rural and the small urban communities in the southern end of Cochabamba Department. In a few of the larger urban centers, water connections exist in rudimentary form. In several cases, clustered rural communities have gone to great lengths to obtain village drinking water, often utilizing their own funds. This is an indicator of the importance given to having a dependable, close-by supply of clean water. The Project will collaborate with chosen communities in providing water and sanitation systems to raise economic, health, and convenience indices in the areas selected. The technologies to be used in these efforts will be those proved effective in the Rural Sanitation Project (511-0458).

(b) Electrification

One of the purposes of supporting a regional development strategy in the southern district is to promote the rational concentration of agro-processing facilities and other services in urban centers, which would then constitute alternatives to Cochabamba as population growth poles. An immediate limitation to this goal is the lack of reliable sources of electrical power in central communities. At the present time, both Mizque and Aiquile are served by diesel generators which operate only a few hours a day.

The Project will focus initial efforts on improving the existing electrical systems of Aiquile and Mizque as part of a more general regional development strategy. The PADC will encourage the design of a plan in which users pay the true cost of the electricity they consume. In later project stages, the PADC will underwrite a feasibility study for developing hydropower in the southern district, plus the preparation of a regional electrification plan.

(c) Rural Roads

At the termination of the Rural Access Roads II (RR II) Project in December 1987, activities in the AHV region will be incorporated into the Chapare Regional Development Project (CRDP), as described earlier. Activities for 1988 include: 1) termination of possibly uncompleted roadwork between Angostura and Arani, and between Mizque and Aiquile, 2) improvement of 107 kilometers of road between Arani and Mizque, 3) construction of five bridges in the upper valleys of Cochabamba, and 4) analysis of other possible road and bridgework needs, especially in the area of Aiquile and possibly in the Chapare, with communities which have significantly reduced coca production through voluntary eradication. The technologies chosen for this work will be those that worked well under the RR II Project (511-0466) and are described in the related Project Paper.

## B. Institutional Analysis

### 1. Overview of Proposed Organizational Structure

The CRDP since its inception has been implemented with the SDBT, now renamed the PADC, as its central coordinating agency with major Project components being administered through inter-institutional agreements with IBTA/Chapare and other organizations. The original Project Paper analyzed at length the options for this basic Project implementation structure, which continues under this Amendment, with some refinements. Therefore this Section does not analyze the structure further, but only describes the changes to be made to it and the justifications for the changes.

Based upon Project experience working with the SDBT and recommendations from the Implementation Planning Studies, two key, although minor, changes in project implementation will be made under this Amendment. The first of these is the decentralization of the PADC by creating two sub-project implementation offices, one in the Chapare and one in the AHV region. The second is the creation of a separate PADC Planning and Communications Unit.

Decentralizing the PADC will place personnel in the actual areas of Project activity, which step will increase staff knowledge of the nature of the problems they are facing and enable them to more effectively coordinate responses to these problems, in line with overall project objectives. A strong Planning and Communications Unit will provide a "niche" for building socioeconomic analysis capacity into the Project and will serve as the primary institutional link between the PADC and other organizations.

In the revised organizational structure, the primary role of the PADC will continue to be that of a coordinating unit rather than that of an agency directly involved in project implementation. The Planning and Communications Unit will be the main point of contact with the institutions working with the PADC, while the Technical and Financial Units of the PADC will provide backstopping in their particular specialties.

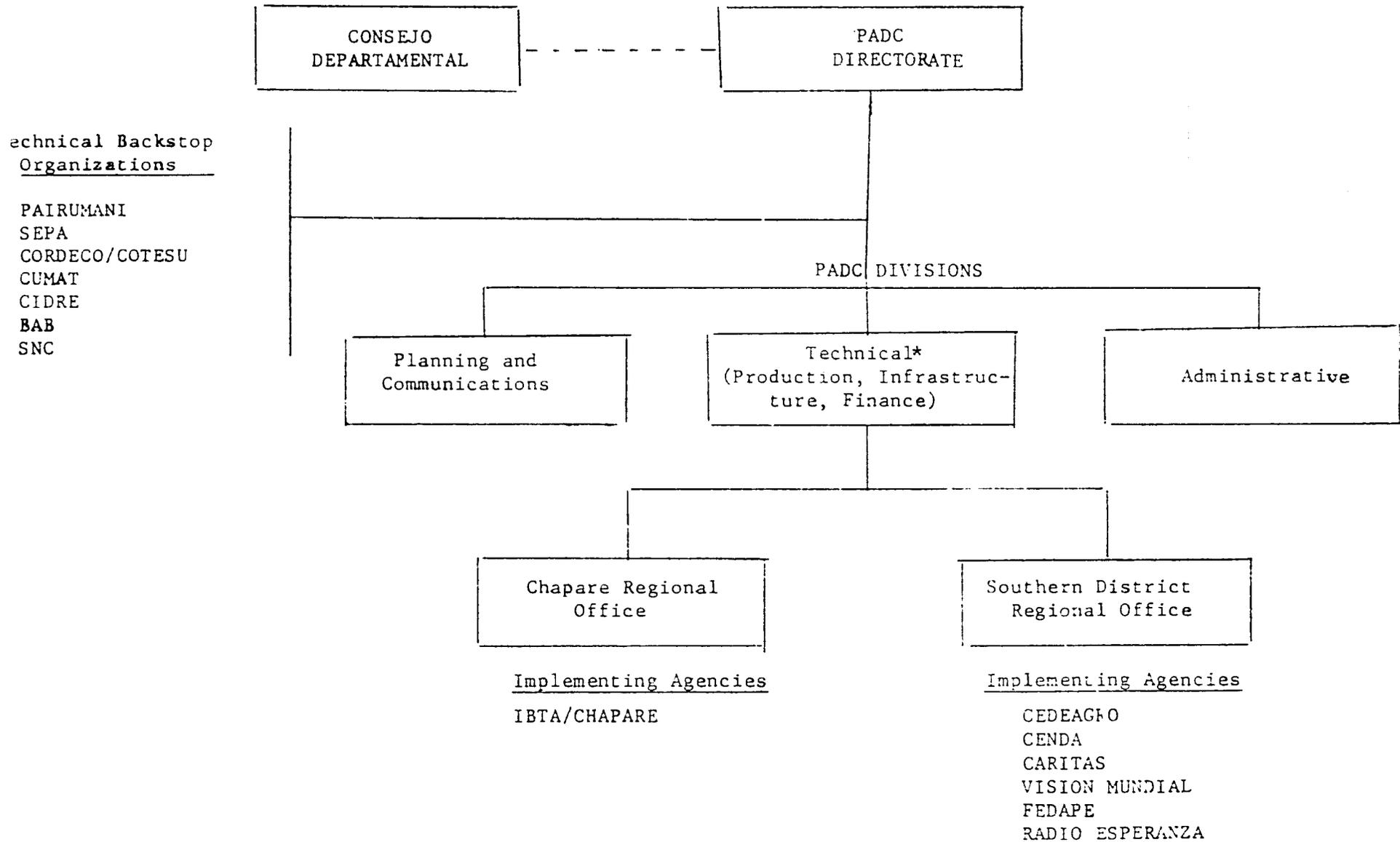
### 2. Structure and Function of the PADC

#### a. Overview

Figure 1 illustrates the proposed organizational structure for the reprogrammed CRDP. It contemplates a decentralized PADC, composed of sub-regional offices in the Chapare and the Southern District, which will be charged with monitoring and coordinating specific field activities. General coordination of overall activities will be the responsibility of the Office of the Director, to be based in Cochabamba.

FIGURE 1

ORGANIZATION CHART FOR REVISED PROJECT IMPLEMENTATION



Supporting the Office of the Director in this function will be three divisions, the Division of Planning and Communications, the Technical Division, and the Administrative Division. While nominally based in Cochabamba, personnel from these divisions will be expected to spend a large amount of their time in the subregional offices in support of specific field activities.

As before, the PADC will be assisted in its coordinating role by specialized institutions which can provide support in specific areas. These institutions will include the Servicio Nacional de Caminos (SNC), with which the PADC already has an inter-institutional agreement under Rural Roads II Project, the Banco Agrícola de Bolivia (BAB), which will disburse credit in support of project activities, and the Centro Fitotécnico Pairumani, which will provide research and training support in the production of cereals and associated crops. Since there is little overlap of technical institution skills in the AHV region, these groups were selected for competence, and not competitively. In addition, it is likely that the PADC will establish an inter-institutional agreement with the Centro de Investigación y Desarrollo Regional (CIDRE), which has extensive experience throughout Cochabamba in the collection and analysis of socioeconomic and agricultural production data, and which works within a regional development framework similar to that proposed by the PADC for the Southern District.

Most project activities will be implemented by institutions already working in the sub-regions, or which have demonstrated expertise in conducting activities in topical areas related to project needs, including CEDEAGRO, CIDRE, CENDA, CARITAS, FEDAPE, Radio Esperanza, and Vision Mundial. The mechanism for incorporating these organizations into the Project will be the Pilot Investment Fund to be administered by the PADC, which will be used to support activities that are conducted by the various institutions, but which are consistent with the overall project goal of promoting development that will reduce migratory pressure.

b. Regional Offices of the PADC

The PADC will establish sub-regional offices in areas where projects are concentrated. One office, to be located in Villa Tunari, will supervise activities in the Chapare. The other will be located in the southern district, probably in the town of Mizque since this is the area in which the greatest amount of agricultural and other development activity is anticipated. The sub-regional offices will give the PADC a physical presence in project areas that it has not had in the past.

The establishment of the sub-regional offices is an essential pre-requisite to working with other institutions to promote a coordinated development effort. The offices will be responsible for monitoring day-to-day project activities and informing the Office of the Director, in Cochabamba, when support in areas such as credit disbursement is required. The sub-regional offices will also coordinate the activities of local implementing institutions so that these do not compete for the attention and loyalty of beneficiaries, and so that project resources such as vehicles are used as efficiently as possible.

### 3. Institutional Learning

In order to provide the PADC with a mechanism for institutional learning on the basis of its development experience, and for coordinating its activities with those of other entities not directly tied to the Project, the modified organizational structure proposed in this Amendment includes an advisory council to assist the Office of the Director. The Advisory Council (Consejo Departamental) will meet at least every six months to review the activities undertaken by the PADC and provide the Director with recommendations on possible future directions of PADC work. It is proposed that the Council be composed of representatives of: the PADC, those implementing institutions which have worked directly with the PADC on a project during the preceding period, the general support institutions which have also been active during the same period, and representatives of those public institutions with legal responsibility for coordinating regional and agricultural development activities in Cochabamba, specifically CORDECO and the Ministerio de Agricultura y Asuntos Campesinos (MACA). The Council should also include a representative of the Federación Unica de Campesinos, which is the umbrella organization for the small farmer unions in the Valleys and in the Chapare.

### 4. Participation of Beneficiaries

The proposed organizational structure was devised with the intention of maximizing the participation of organizations attempting to promote economic development in the areas to be affected by the revised project, and of maximizing the potential for direct participation by project beneficiaries themselves.

Over the course of its mission, the Project Amendment team accumulated qualitative evidence that the opportunities generated by the Project do not have to compete directly with the high revenues to be earned through participation in coca and cocaine production. The exploitation associated with providing labor to an illegal enterprise, the risk of arrest and imprisonment, chronic health problems suffered by many Chapare migrants, and the long-term separation of families are only a few of the many negatives that rural dwellers cite when they speak of their migratory experiences. For many, a relatively modest improvement in conditions in their home areas will compare favorably with the potential earnings from coca production when these negative factors are added into the balance. However, for this to translate into a change in migratory strategy, potential migrants must be convinced of the viability of the alternatives being presented, and this will only happen to the degree that they participate in the formulation of those alternatives.

As discussed in the social analysis of the modified CRDP, an area that will be critical to Project success is the participation of women. At present, this remains a weakness in that this is not a major focus of any of the institutions collaborating with the Project. The Project itself, however, will emphasize the participation of women as an important element in its cooperative strategy with local institutions.

### C. Social Soundness Analysis

#### 1. Historical Migratory Patterns

One of the key objectives of the Project is to stem the continuing outmigration from the high valleys of Cochabamba to the Chapare and to improve the social and economic development potential of the AHVs in order to foster return migration of some of those who have left. However, large-scale migration of rural workers from the inter-mountain valleys of the Department of Cochabamba is not a new phenomenon. Since the re-emergence of the Bolivian mining industry in the second half of the 19th century, poorer residents of the AHVs and other agricultural areas have been the primary source of labor for the mining centers whenever production was expanding due to high international ore prices. When prices declined, this labor force, which had always maintained its ties with its home communities, was reabsorbed back into the population of Cochabamba.

This general pattern of outmigration for temporary periods continued in the wake of the 1952 Agrarian Reform. In addition to working in the mines, however, there were expanded opportunities for laborers to stay in Cochabamba to work the land in response to the increased demand of the mining centers for food. However, the approach taken by the Agrarian Reform of simply dividing the land among families living on it created land units in the AHVs that were inadequate to support capital investment in agriculture. Finally, as subsistence costs increased and population on the land grew, the productivity of the land units quickly deteriorated to the point where even the basic consumption requirements of the farm-owning families could not be met. Hence, the scope and intensity of migration was expanded. The destinations have been diverse, but chosen primarily in response to unmet demands in the labor markets.

Several destinations have emerged as particularly important for migrants, including Buenos Aires (Argentina), Santa Cruz, and, most recently, the Chapare. In Buenos Aires, male immigrants from Cochabamba, Potosí, and Sucre have become very important sources of labor for the construction industry, and women migrants frequently find work in factories or as domestics. In Santa Cruz, many individuals find seasonal labor in the commercial agricultural enterprises of the region, particularly sugar cane and cotton harvests. Over time, many of the original migrants have remained in areas designated as colonization zones to the North of Santa Cruz, especially when small land holdings were available and there were economic incentives to stay. Most recently, the Chapare has become the destination of the majority of the migrants as a result of the high wages offered by the narcotics industry and the fact that Chapare is close to their home areas in comparison with other migratory destinations. Yet, migration to the Chapare is increasingly viewed by the rural workers as being high risk, with long-term instability and exploitative working conditions. In addition, evidence has shown that the individuals who do select the Chapare as their migratory destination maintain contact with other migrants in other locations in order to keep their employment options open.

Concurrently with the Project, the GOB will carry out activities intended to reduce wages and increase the perceived risks for coca production activities in the Chapare. The amended Project will offer economic incentives, such as the potential both for increased agricultural productivity and improved rural income and wages to attract individuals back to their areas of origin and enable them to sustain themselves and their families in the AHVs. This strategy is clearly coincident with the historical patterns of migration where: (1) migrants have been reabsorbed back into the Chapare once the temporary employment was over; (2) the rural workers have a well-developed information system and have been able to respond rapidly to changes in labor opportunities; and (3) when possible, migrants residents will stay in areas where there are reasonable work opportunities and wage rates.

However, since there is a well-developed information system among all the migrant laborers in the various destinations, despite the intent of the Project Amendment to stimulate return of migrants from the Chapare, it will be impossible to address migration to the Chapare separately from migration generally. Therefore, although the chief impact of the Project Amendment will be on the AHVs region, the Project has the potential for "spread effect" far beyond the confines of the targeted beneficiary groups' area.

## 2. Spread Effect

Relatively few of the residents in the AHVs who have become migrants expect migration to be permanent. Rather, studies show that the goal of these migrants is to earn a sufficient capital base to return to their homes. To the degree that the GOB's interdiction efforts are successful, and the activities carried out under the Project are able to generate employment opportunities in the AHVs, the historical pattern would indicate that laborers from Chapare would return to their areas of origin and other potential migrants would not after all move.

However, the information networks that exist between the home areas and the most common migratory destinations are sophisticated, and constantly carry information on changing labor conditions in the different areas. Hence, an unanticipated impact of the Project might be to stimulate return migration from other destinations. In addition, the development of migration as a permanent fact of life for the AHVs has had negative impact on the region. These consequences include the creation of labor scarcity in rural areas, lack of labor for community infrastructure activities, and the spread of activities which have low labor demand but permit long-term deterioration of the natural resource base (an increase in livestock which requires virtually no labor investment, but where unattended grazing causes extensive damage to the hillsides). Hence, the initiation of Project activities such as financing irrigation projects, natural resource management (such as reforestation and watershed management), and soil conservation should assist in reducing the long-term detrimental effects on the natural resource base of the AHVs of outmigration.

Finally, Project activities will focus in four areas, the improvement of infrastructure, the introduction or expansion of irrigation, the promotion of sustainable increases in agricultural production, and the

promotion of agroindustries to process and add value to agricultural production. The purpose of these activities is to increase on-farm incomes through increased production and improved marketing conditions, and to generate off-farm employment opportunities in the AHV area. Such an expansion of economic opportunities should, over the long term, reduce the pressures on members of beneficiary populations to migrate.

### 3. Social Consequences to Beneficiary Groups

In anticipating the response of the Chapare population to continued interdiction in the lowlands and improved economic opportunities in the valleys, it is important to remember that the population of the Chapare is not homogeneous, but is divided along class lines that parallel Bolivian society as a whole. Therefore, the Project's impact on and benefit for the various groups of individuals -- migrants, land-holders and women -- will vary.

#### a. Impact on Migrant Labor

The immediate response of migrant workers to interdiction is expected to be to withdraw from the Chapare and return to their home areas, as they have done in the past when repression against coca production has intensified. They can then be expected to remain at home for a short time, waiting for the repression to ease as it has in the past. If this happens, the migrant workers will return to the Chapare, and production will continue as before. If the repression is sustained, however, the same need to generate off-farm income that obliged them to migrate in the first place will continue to exist. Unless other alternatives are found, out-migration can be expected to continue, albeit to an alternative destination perhaps for coca production also.

#### b. Impact on Landowners

The response of landowners to interdiction efforts will be less immediate than that of migrant workers. Because of the investment they have made in labor and money to acquire land and bring it into production, they will be reluctant to abandon coca as a source of livelihood. In the face of intensive repression, they can be expected to leave the Chapare for a short-time or to remain and maintain a low profile. If interdiction efforts are sustained, however, landowners will be likely to want to try to protect their investment. They may choose to do this in several ways. Recent indications are that they are becoming more receptive to agricultural development activities attempting to promote alternative production systems to coca cultivation. The other and less desirable alternative would be to fight interdiction efforts, meeting force with force and greatly augmenting the level of violence in the zone. However, this scenario is less likely given adequate income from other sources, and the increased level of GOB police and military presence in the zone.

#### c. Impact on Women

The project goal of reducing migration rates also increases the importance of involving women directly in agricultural production and income generation activities. While rural men and women alike attribute a secondary role to women in agricultural production, there is considerable

evidence that women make a major contribution in this area, particularly with regard to vegetable crops and livestock raising (Carafa et al., 1987). In any case, women assume responsibility for management of the farm as well as for domestic activities when men migrate. Furthermore, most projects involving community work, such as the construction or improvement of irrigation ditches or tree planting, necessarily take place during the dry winter months when agricultural activity is at a low. This is also when male migration from the AHVs is at its highest level. Thus, in order to make progress quickly in areas such as the installation of irrigation systems, the construction of soil and water conservation works such as galerías filtrantes, and in teaching soil and water management for agricultural systems under irrigation, it will be necessary for the Project to work directly with women.

There are currently 148 women's clubs in the Southern District of the Department of Cochabamba, most of which have been organized by CARITAS, while a smaller number have been sponsored by FEPADE. By cooperating with these PVOs, the Project will have an excellent basis for working with women. The primary problem lies in the area of reorienting the approach that the PVOs have taken to women's issues. The activities undertaken have focused on women's domestic labor rather than upon their role in agricultural production, with typical activities involving knitting, community vegetable gardens, or the making of household articles such as soap and candles. While some of these are ostensibly income-generating activities for women, their goal is clearly limited to providing women with "pocket money" to supplement what they receive from their husbands. This Project will train women in productive areas that are directly related to the family's primary sources of livelihood, such as agricultural production techniques, the management and maintenance of irrigation systems, and livestock management.

#### D. Economic Rationale

This section provides the economic rationale for moving farm families from the Chapare to selected areas in the Associated High Valleys of Cochabamba department. This activity is best considered a first phase of a possible larger effort. It is intended to satisfy the needs of only a portion of the farmers in the Chapare region. The total amount of funding to be provided includes reprogrammed funds of \$16.2 million of AID money and \$3.95 million in local currency from Bolivia, as well as \$5.75 million in new AID grant funds, \$32.0 million in new funds from Bolivia, and an additional \$11.0 million from Project beneficiaries. This is by no means sufficient to resettle the 45,000 potentially displaced farm families from the Chapare in the Associated High Valleys. It is only intended to finance the first phase of the population transfer - - perhaps the relocation of some 7,000 Chapare families (approximately 15% of the total families who would leave the Chapare). At the same time, up to 7,500 additional families who have not yet migrated to the Chapare would benefit from the Project and would be motivated not to go to the Chapare. At this point, the Chapare Regional Development Project will concentrate on developing the portions of the Associated High Valleys with the greatest potential for socio-economic advancement and the greatest need for investment in the areas of infrastructure, credit, and other activities. A series of inter-disciplinary studies on regional economic development potential have been carried out to identify these areas. If

successful, the Project could be gradually expanded to accommodate the remainder of the Chapare excess population which might resettle in other parts of the Associated High Valleys or in other locations.

The basic rationale for moving farm families out of the Chapare is that this area does not have nearly enough cultivable land to support the current farm population, if that population significantly reduces its present coca production. The Chapare is a tropical region characterized by heavy rainfall and, for the most part, very poor soils that are not suitable for intensive cultivation of basic grains or vegetables. It is ideally suited for the growing of coca and tree crops, such as citrus fruit, which produce only after a period of 5 to 7 years. However, the large influx of population that took place in recent years is due solely to the high rate of return realizable from coca and its associated narcotics end products.

The following land use table developed by the Tropical Science Center in 1983 clearly demonstrates the inability of the Chapare region to support the approximately 60,000 families if they were to be engaged in agricultural activities other than coca cultivation. The 422,000 hectares in the Chapare Project area were classified as follows:

1. Area Suitable for intensive cultivation: 4,075 hectares (or 1% of the total).
2. Land mostly suitable for pasture: 55,772 hectares (13.2%).
3. Land suitable for tree crops: 74,897 hectares (17.7%).
4. Forest lands (exploitable for lumber production): 149,581 hectares (35.4%).
5. Forest land required for soil protection (not to be cut): 138,383 hectares (32.8%).

Thus, out of the 422,000 hectares, less than 1% are suitable for intensive crop cultivation. Some 135,000 hectares (sum of items 1, 2 and 3) are potentially suitable for a combination of crops, pasture lands, and tree crops. Note that a relatively extensive land area is required to feed a farm family if the land is suitable only for tree crops or pastures. If used for pastures, a hectare can support no more than an average of two head of cattle. Since a minimum of 15 heads is required to maintain an average rural family, this would indicate a requirement of at least 7.5 hectares of pasture land per family, plus an additional 2 to 3 hectares to plant some subsistence crops. Thus, an average farm family making a living in the Chapare from sources other than coca would require an average of at least 10 hectares. The total requirement for the present farm population - - about 60,000 farm families - - would thus be around 600,000 hectares, as opposed to a total potentially cultivable area of around 135,000. Conversely, the estimated cultivable area of 135,000 hectares could support only some 13,500 families, leaving an excess of about 46,500 that would have to move. Preliminary studies undertaken by consulting firms on contract with the AID Mission indicate that lands in the Associated High Valleys of the Cochabamba department provide a good alternative - - in terms of both quality of agricultural land and amount of land available - - to absorb some of the farmers displaced by the coca eradication program.

Preliminary data obtained by Project consultants indicate that soil and climatic conditions in the Associated High Valleys area are favorable to the production of a variety of crops (e.g. corn, onions, tomatoes, and potatoes), provided farmers have access to about 5 hectares per farm family, and to technical assistance and credit (to cover production costs during the first year and the purchase price of the land for those who do not own land already). The total cost of financing the first year of operation of a five-hectare farm (excluding acquisition costs but with improved technology) is estimated at about \$1100 for non-irrigated land and \$1600 for irrigated land. Reliable data to serve as a basis for benefit-cost or internal rate of return calculations are not yet available. The process of collecting such data is greatly complicated by the following considerations: (a) farms in the Associated High Valleys region typically produce a variety of crops, each with its own costs and prices; (b) the production pattern - - the mix of crops grown - - varies significantly from region to region, from farm to farm and from period to period; (c) inflation has affected prices and costs differently, so that the historical data are irrelevant and an entirely new set of surveys is needed; (d) the Project has several components other than agricultural research and extension including reforestation, micro-irrigation sub-projects, potable water and sanitation, electrification, and processing of agricultural products - - each of which requires a different type of economic analysis to test viability.

Prior to the implementation of each sub-project, its economic feasibility will be analyzed. These studies could not be done at the time of the PP Amendment preparation. The following paragraphs provide an outline for the studies to be completed prior to the implementation of each subcomponent. Short term technical assistance will support the strengthening of this institution's capacities in doing economic feasibility analysis. The PADC will undertake these analyses and will use them to establish priorities among proposed activities.

1. Economic Analyses for Subproject Areas

This economic analysis will include:

- Demand analysis for agricultural extension based on sample surveys and information about the location, type of crops, appropriate land availability, and other indicators.
- The analysis will be based on assumptions regarding:
  - The farmers ability to obtain the inputs required to produce the planned increase in agricultural production.
  - Cost of production of improved seeds or young plants;
  - Investment and operating costs of research and extension facilities;

- Estimations of potential increase in agricultural production resulting from research and extension services, and
- A budget that will enable the subcomponent to meet farmers' needs for assistance.

## 2. Natural Resources Management

### a. Reforestation

Once the location and size of the areas and the xerophytic \*/ species are determined, the economic analysis of the sub-component will include: Estimate of the benefits from reforestation as reflected in its potential impact on the long-term productive capacity of agricultural land, including benefits resulting from prevention of damage from floods and droughts.

### b. Over-grazing

Once the degree of seriousness and the effect on the ecological system is determined by zones, the economic feasibility analysis of the sub-component should include:

i. A general estimate of costs obtained basically from the costs of the research project, the diffusion and control of the improved livestock management procedures (operating costs), and the necessary additional inputs (agrochemicals, tools) that the farmer will need, and

ii. A cost effectiveness analysis.

## 3. Agricultural Production

This sub-component's economic analysis will include analyses for each of the targeted crops as increased agricultural production does not necessarily imply an improvement in the farmer's income, and as a result, success in the overall objective of the project.

Before analyses are carried out a careful identification of crops should be made to identify those that are most profitable. Consideration should be given to different strategies, such as specialization of regions in different crops.

The analysis needed calls for the following:

- A benefit/cost analysis at the farm level by region.
- Basic information on the price, yields, structure of production cost, technology used, etc. either updated from existing data, or obtained from sample surveys and/or surveys;

\*/ Plants structurally adapted for life and growth with a limited water supply.

- Benefits to be based on the estimated increase in gross revenue accruing to the farmer;
- Costs based on the increment in costs of production (increase in the use of agrochemicals, credit, improved seeds, improved technology, etc.);
- Internal rate of return and benefit cost parameters calculated for a sample of representative crop patterns; and
- A marketing study for the domestic and international markets in order to evaluate the demand, quality standards, price, marketing procedures, and other constraints in each type of market.

#### 4. Credit

An economic analysis for this component will draw on the economic analyses under 3 above, and will consider the following:

- Profitable labor intensive crops must be identified. Each crop has to be studied thoroughly to assure that the farmer will be able to repay when credit is channelled to finance crop production. Otherwise, funds can be diverted and used for illicit purposes.
- A credit demand analysis must be done at the farm level that will explicitly determine the amount needed per average farmer and the purpose of such credit. Demand will depend, among other things, on the crop to be cultivated, the technology to be used, and the type of land (irrigated or non-irrigated) under cultivation.
- Effective control procedures must be put in place to guarantee the proper use of funds.
- A timely, prompt, and effective credit channelling process will be designed in order to attract credit demand and satisfy the farmers' needs.
- Impact of credit on benefit/cost ratio should be calculated.

#### 5. Rural Industry and Marketing

Project feasibility studies for each small industry will be undertaken. These studies will include:

- Marketing studies for the domestic and international markets including demand and price analyses, quality standards, marketing procedures, etc.
- Infrastructure constraints such as the lack of water, energy, roads and their effect on production costs.

- Thorough analysis of input availability (wood, clay, corn).
- Financial analyses including benefits from the production of processed products and increased input production and its impact on income and employment at the agricultural and manufacturing levels.
- At the small industry level, calculations of rate of return, costs and benefits.

6. Productive, Transport & Community Infrastructure

a. Productive Infrastructure

Economic analysis for irrigation sub-projects will depend heavily on the type of crop(s) to be cultivated and the size of each system. A benefit/cost and IER analysis should be undertaken for projects exceeding US\$200,000. These will include:

- Crop yield estimates under irrigated cultivation.
- Benefits from irrigation for increased agricultural production, livestock breeding, and other farmer activities, and their effect on employment and income.
- Costs of investment and maintenance (if appropriate) of the irrigation systems.
- Calculation of costs and benefits and rate of return.

Potable water and electrification economic analyses will include:

- A demand analysis to determine the size and type of the sub-project required, and thus, the magnitude of the investment.
- A financial analysis to include investment, operating, and financial costs that will determine the price at which this service will be provided.

b. Transport Infrastructure

For major road and bridge construction (e.g. investment over US\$200,000), the economic analysis will include:

- Basic data from sample surveys on the number of people affected, relative importance of the agricultural area, crop production, potential yield improvements, potential migration, etc..

- Estimates of benefits from road and bridge construction and/or improvement of increased agricultural production and commercialization and its impact on rural residents' quality of life.
- Calculations of costs of road construction investments, operational costs, maintenance costs, and financial costs to determine costs and benefits, and rate of return.

The success of the Project hinges on two key issues:

i. First, economic, and social incentives to abandon coca production must exist to induce significant numbers of farm families to move out of the Chapare region. As long as coca production is highly profitable and relatively risk-free, this will not occur. Thus, a basic assumption of the Project is that the Government will take action to significantly reduce the profitability of coca production by depressing the demand for coca - - through destruction of processing facilities, and interdiction in the movement of precursor chemicals, etc. At the same time, the economic risks of engaging in coca production must be significantly increased by the fluctuations to be created in coca prices.

ii. The Associated High Valleys region must have sufficient land and other resources to absorb the returning farmers. Two observations are relevant here: (a) many farmers of the Chapare region already have land in the Associated High Valleys and will be returning to their farms if coca production is no longer profitable (It is not known how many farmers are in this category.); (b) It is not expected that a majority of farm families moving out of the Chapare region will settle in the portions of the Associated High Valleys area receiving CRDP investments in this phase of Project implementation. At this stage, the AID Project will concentrate on developing the portion of the AHV area which has the best potential and the greatest need for infrastructure. If this first phase of the Project proves successful, additional funds will be sought to help relocate additional thousands of farm families into other portions of the High Valleys region and possibly into other locations.

## E. Environmental Analysis

### 1. Overview

This report deals only with environmental issues for the Associated High Valleys component of the CRDP. The Chapare environmental study remains as approved for the original Project Paper in 1983.

A preliminary assessment and field verification of the actual environmental conditions prevailing in the AHV region was performed in order to prepare this Amendment. However, the impact of individual sub-projects can only be assessed as these are developed in detail.

Immediate activities in the AHV region, which will take place as soon as possible after the Project Agreement Amendment is signed with the GOB, will concentrate on upgrading or continuation of efforts begun earlier (e.g. improved electrical and irrigation systems, roadwork under the Rural Roads II Project, etc.). The environmental analyses for these activities have already been approved. Simultaneously, studies will be begun to plan the medium-term activities in the AHV. As each area of specific activity is studied, (watershed management for X area, reforestation in Y area, etc.) an environmental analysis for it will be prepared and forwarded to the Region's Environmental Advisor (REA) in Washington, D.C. for approval.

## 2. Community Participation and Rural Communications

In order to be effective and achieve long-term benefits, the environmental/resource management strategy proposed for this Project must involve not only participating institutions, but especially the small farmers and other rural dwellers of the target areas. Their participation is essential in carrying out, and, most importantly, maintaining and expanding the effects of the proposed activities.

The Project will, therefore:

1. Contact community and small farmer organizations (either directly or through the executing institution) and their participation in the planning and design of any activity will be encouraged. While their participation will be required in the proper and environmentally-sound execution of many of the activities, their cooperation will be assured only if they feel the plans reflect their personal and community needs.
2. Function as a demonstration of appropriate resource and environment management practices (e.g., watershed and livestock management). Therefore, the Project should ensure that the largest possible number of farmers participate and "see" the demonstration areas.
3. Establish mechanisms for farmer to farmer exchanges of information on the demonstration areas. It is believed that smallholders are the most effective extensionists and that their effectiveness in knowledge transfer and environmental protection is a function of their participation.
4. Encourage mass media and communication networks (radio, news weeklies, and pamphlets) to play a critical role in the extension and appropriate environmental control processes relative to appropriate watershed and livestock management techniques. The institutions involved in rural communications (Radio Esperanza, Cono Sur, Fundación Portales) must be involved since they are beginning research/extension activities in their areas of influence (Associated High Valleys, Southern District.) These institutions will also receive full support and technical advice in developing appropriate materials to be broadcast and published (i.e., environmental education packages and progress reports on specific research/extension activities).

5. Establish a special rural extension committee coordinated by the Communication/Coordination Unit of the PADC and consisting of members of the institutions executing the research/extension activities in the Project area, personnel from the radio and news weeklies active in the region, and the technical advisors for specific activities (e.g., watershed management and animal husbandry). The function of this committee should be to plan and design promotional and educational campaigns on different activities executed in the Project area. This educational effort will include protection of the environment.

VI. PROJECT IMPLEMENTATION PLAN

A. Subproject Implementation Plan

1. Year I

A timed, activity chart for Year I of Project Activities, divided between Chapare and ANIV efforts, will be prepared in conjunction with the GOB once the Agreement Amendment is in place. A general description of these activities follows.

a. First six months

During the first six months of revised Project implementation, a number of pre-investment studies will be conducted to provide the basic information needed to pursue a comprehensive regional development strategy. These will include basic studies of land tenure, water distribution, and labor availability, as well as studies upon which comprehensive irrigation plans for the Mizque plain and the Calicanto River, near Tarata, can be based. In addition, the pre-investment studies will include a comprehensive crop inventory of the Southern District and preliminary surveys to define more precisely the options for improving farming systems in the region. Environmental concerns will also be addressed in each study. A series of marketing studies will also be undertaken in order to identify potential niches for agricultural products in the generally saturated regional market, and to identify new markets for agricultural products. Given the current lack of solid information upon which to base regional development activities, these studies will pave the way for a comprehensive development strategy based upon a more precise knowledge of how migratory pressures might be reduced.

While the design of the full range of new Project activities must await the results of the preinvestment studies, a number of specific development efforts will be undertaken immediately. These will give the project immediate visibility and create momentum for the activities to be carried out later.

In the area of agriculture and forest production, immediate activities will include: watershed management; reforestation; improved potato seed production; grain and legume production; pasture and forage improvement; technology improvement; and institutional strengthening. In the area of productive, transport, and community infrastructure, immediate activities will include: the collection of irrigation-related information concerning water flows, runoff, sedimentation, sub-soil levels, and water quality to determine the feasibility of specific activities; improvement of up to seven existing but deficient irrigation systems; improvement of the Angostura-Tarata and Aiquile-Mizque roads; the installation of several potable water systems in communities in the Project area; and the improvement of the existing electrification system in Aiquile and Mizque. Finally, there will be actions taken immediately upon signing the Amendment to provide technical assistance for institution building for the Program for the Alternative Development of Cochabamba (PADC), the implementing agency for the Project. Experts will be contracted in social science, irrigation and on-farm water management, environmental monitoring, forestry, and farming systems research and extension.

The improvement of the road sections between Lago Angostura and Arani, and Aiquile and Mizque, is already underway through implementation of the Rural Roads II Project, and will continue during the first six months of the Amended Project. This activity has already created considerable good will for USAID/Bolivia and the PADC, particularly in the southern district and in Tarata. On January 1988, road improvement in the Associated High Valleys will become a direct component of the CRDP and all remaining RR II funding will be transferred to the Project, as mentioned earlier.

Finally, the agreements with institutions that will provide technical backstopping will be defined, approved, and signed, and their capacity to support project activities will be strengthened during this first six-month period. These will include the Centro Fitotécnico Pairumani and Semilla de Papa in the area of agricultural production support; CORDECO/COTESU, the Escuela Técnica Forestal, and CUMAT in the areas of reforestation, soil and water management, and land use planning; the Banco Agrícola de Bolivia in the area of agricultural credit; and the Centro de Investigación y Desarrollo Regional in the areas of socioeconomic data collection and analysis. An agreement with the Servicio Nacional de Caminos for the road improvements mentioned above is already in effect and will continue. Simultaneously, the Planning, Communications and Coordination Unit of the PADC will begin to solicit proposals for activities in the Southern District from organizations working in that area. The first of these should be received and approved by the PADC during the first six months of the Project. Among the institutions expected to submit proposals quickly are CENDA, in order to conduct an improved potato seed project in Raqaypampa, and Radio Esperanza to improve its transmitting facilities and strengthen its development promotion and actual programs.

b. Second six months

During the second six months, most of the preinvestment studies will be completed and approved (including approval of environmental assessment amendments by the REA), and activities based upon the results will be initiated. These will focus on the expansion of irrigation in the Mizque plain and on the Calicanto River near Tarata, and on the promotion of the production of agricultural products for which markets have been identified. The Project will also move ahead with a two-pronged farming systems improvement effort, one aimed at dryland agriculture and the other intended to enable farmers with irrigation to take advantage of the production potential this provides. The socioeconomic studies undertaken at the outset of the Project will also provide a knowledge base to permit the Project to promote a modest form of livestock management. Efforts in this area will proceed in tandem with activities to promote more productive farming practices and improved soil and water management.

By the second six months of revised project implementation, the volume of proposals requesting support from the Project Investment Fund should be significant. One major area of activity is expected to be the construction of irrigation works, as noted above. Another important area will probably be income generating activities for women channelled through the

women's clubs of CARITAS and FEPADE. A third area may be in the area of community infrastructure, as institutions such as CENDA seek support to improve housing in order to reduce the incidence of chagas disease.

Finally, support for the Instituto Tecnológico Agropecuario Canada (ITAC) in Tarata should be undertaken within the second six months. Initial activities will include the construction of a new dormitory, and the irrigation of approximately 23 hectares of land. A curriculum development effort intended to enable ITAC to support project activities in agricultural development will be undertaken in the second year of revised project implementation.

## 2. Year II

During the second year of the Project, long-term activities such as the Vacas reforestation effort, and the development of a comprehensive land use plan and its promotion among farmers will continue. The construction of irrigation works will also continue. In addition, as farming system support efforts multiply, and as the potential for developing agro-processing facilities or rural industries becomes better defined, the demand for credit should expand considerably. Based upon the needs defined by the Project as agricultural development efforts progress, and an assessment of institutional strengths and needs, ITAC will receive support to develop its curriculum. This support may include scholarships for people from the southern district and Tarata to attend ITAC with the expectation that they will return to their home areas to apply their skills. Similarly, the support for the Escuela Técnica Forestal, which will have begun during Year One, will have resulted in the placement of students in high valleys reforestation efforts during the second year.

## 3. Year III

By the third year of the Project, most of the construction of irrigation works will have been completed, and the focus of activity will be the on-farm distribution and management of the water. The Project will be able to offer farmers a variety of technical packages which have been adjusted to local conditions, and which are coordinated with a marketing strategy. Demand for credit for agricultural production and rural industries can be expected to be at its highest point so far in the Project as the impact of previous activities is felt.

## 4. Years IV - V

Activities during Project Years IV and V will be continuations of earlier efforts, amended by experience and the results of evaluations. The credit and production components will be large and growing, and consolidation of various successful experimental efforts will be underway. A specific implementation plan for these final years will be developed during Year III, based on progress to that point, and expectations for the future.

## B. Implementation Guidelines

In order for the Project's activities to achieve their objectives and sustain the development effect over and beyond the duration of the Project, a number of measures will be taken:

1. Activities will be planned and implemented only when the participating institutions have the proven capacity to carry out the activities both in terms of personnel and organizational structure.
2. Strengthening of an institution (personnel and financial support) will consider the capacity of the institution to absorb the organizational burden of expanding into new activities and/or geographic areas of influence.
3. Field research activities will be coordinated with the rural population whose land could be used for demonstration areas or whose economic activities could benefit from the research results. As research activities are evaluated as a function of the application of results beyond the experimental plots, the participation of farmers in the research activities is essential. The potential benefits of these activities need to be properly explained to the entire community.
4. Specifically, for the research/extension activities involving animal husbandry and to a certain extent, watershed management, it is essential to encourage the participation of women. As tenders and often owners of livestock, women are the natural audience/participants in the development of appropriate livestock management techniques. Livestock committees involving local women's organizations (e.g., comites de madres) will be established as participants and interlocutores during the execution of livestock management related activities.
5. For all Project activities, interim and final evaluation procedures will be set up that will involve the participants and the potential beneficiaries (comites, farmer, and community organizations). These fora could also constitute the most effective mechanism for extension of research results.
6. The resource management advisor (part of the technical advisory team to the PADC) will monitor all activities that are being defined and implemented during the course of the Associated High Valleys projects. Emphasis will be placed upon environmental impacts (positive and negative) of each activity and a short report detailing these impacts will be prepared and submitted to the environmental officer at USAID/Bolivia and forwarded to the Chief Environmental Advisor (AID/W/LAC) (as noted in the "Environmental Analysis Section").

## C. Implementation Agencies

The main implementation agencies are briefly described below, in order of importance. The MACA and PADC sections are included for completeness, although references to these organizations and their roles have been made earlier. Annex H contains additional material on implementation agencies.

1. MACA/SSADCCS

The Ministry of Agriculture and Campesino Affairs (MACA) will provide administrative oversight to the Project. The Sub-Secretary for Alternative Development and Coca Crop Substitution (SSADCCS) within MACA will serve as the chairman of an Inter-Ministerial Supervisory committee, made up of representatives from the Finance, Agriculture, Interior, Defense, Foreign Affairs, Health, Education, and Transportation Ministries. This Committee, which oversees all GOB narcotics related matters, will provide broad policy guidance to the PADC. Day-to-day project supervision for the GOB, however, will rest with MACA/SSADCCS, which entity will approve operating plans and Project activity budgets and review the progress of development activities. The coordination provided primarily by the MACA/SSADCCS and periodically by the Inter-Ministerial Committee, will ensure that the Project is implemented in conformity with the GOB's overall anti-narcotics policies. Further, the Committee will be able to provide key technical and financial support to Project activities. The Project will fund certain operational costs of the MACA/SSADCCS.

2. Program for Alternative Development for Cochabamba (PADC)

The PADC will have an expanded role in coordinating new Project activities in the Associated High Valleys of Cochabamba and in continuing activities in the Chapare. To improve communications and provide more dynamic decision-making within the Project and with Project beneficiaries and their organizations, the PADC will establish decentralized offices in both the AHV region and the Chapare. These satellite offices will be given the maximum degree of autonomy possible to carry out their work, but overall Project policy and institutional coordination, technical support, and activity approval will remain the tasks of the central PADC office in the city of Cochabamba. Additional long term staff will be recruited for the Cochabamba office to cover the areas of applied social science, rural communications, on-farm water management, and women in development.

3. IBTA/Chapare

IBTA/Chapare will continue to play the same role it has had to date in project implementation. The only change is intensity of effort. As the GOB initiates the voluntary eradication program with Chapare coca farmers, IBTA/Chapare will step up its production and extension activities. Adequate funding will be programmed into the revised budget to enable a significant increase in plant material production to meet the expected demand from farmers eradicating their coca plants.

4. Bolivian Agricultural Bank (BAB)

BAB is the state agricultural bank, and the only financial institution to maintain provincial offices in the towns of Aiquile and Mizque, in the southern district. The BAB will serve as the major channel for providing Project and related credits for agriculture and rural industry activities.

5. National Road Service (SNC)

The SNC will continue as the principal implementing agency of USAID's Rural Access Roads II Project (511-0466) until that effort ends on December 31, 1987. On January 1, 1988, it will become the implementing agency for transport infrastructure under the Rural Infrastructure component of the Amended CRDP. This will be accomplished under a formal inter-institutional agreement negotiated and signed with the PADC. The Mission is currently processing a deobligation of the Rural Roads II excess pipeline, which will be reobligated to the CRDP for Rural Infrastructure in both the Associated High Valleys and the Chapare.

6. Parumani Crop Technology Institute

Parumani is a private, non-profit agricultural research institute which specializes in developing improved varieties of cereals adapted to the specific agronomic and socioeconomic conditions found in different areas of Bolivia. It will provide the Project with research and extension support in cereals and associated crops.

7. Improved Potato Seed Service (SEPA)

SEPA conducts research on improved varieties of seed potatoes. It offers training in the selection of seed potatoes and provides a credit program to facilitate the acquisition of improved seed by farmers. It will support the Project in the improvement of potato production, particularly in upland areas without irrigation.

8. Land Use Capacity Institute (CUMAT)/Center for Conservation Data (CDC)

CUMAT/CDC are private, non-profit research institutions which have already worked with the PADC in land use planning. They will assist the PADC in designing and implementing river basin management strategies in areas where the Project is supporting the expansion and improvement of irrigated agriculture. CDC will cooperate with CUMAT in conducting biological diversity studies.

9. Cochabamba Regional Development Corporation (CORDECO)/Swiss Technical Cooperation (COTESU)

CORDECO/COTESU is a long-term forestry support project which will contribute research and tree stock for reforestation to that part of the Project which deals with river basin management. CORDECO/COTESU will also implement a reforestation plan. This joint effort has designed and will implement a plan for the Vacas area with support from the PADC.

10. Advanced Forestry Technical School (ETF)

The ETF is a forestry school established under the West German (GTZ) technical assistance Mission to Bolivia. Until now the school has focused its research and training efforts on humid tropical forest management. Under the modified CRDP, the ETF will receive support to permit

it to train people who will support reforestation and forest management efforts in the southern district and Associated High Valleys.

11. Center for Investigation and Regional Development (CIDRE)

CIDRE, a PVO, has completed a series of descriptive monographs on a number of the provinces of Cochabamba, including Esteban Arce (Tarata) and Mizque. These monographs bring together available data on agricultural production and socioeconomic issues in the areas studied. CIDRE has also assessed household industries in Cochabamba, important research for promoting rural industrial development. The PADC/CIDRE relationship will be developed as quickly as possible in the Amendment period.

12. Rural Sanitation Service

Separate but complementary rural sanitation activities will continue under the USAID Rural Sanitation Project (511-0458) until September 30, 1987, when the Project ended. The PADC will now examine the need for further activities in rural sanitation and will establish the terms of an inter-institutional agreement with the Ministry of Health, if additional needs are identified.

D. Procurement Plan

1. Commodities Procurement

Both vehicles and equipment may be procured for use by organizations working under inter-institutional agreements with the PADC in support of CRDP activities. These procurements are in addition to purchases for the PADC itself, including its decentralized offices, the MACA/SSDACCS, the Interministerial Committee, and other units directly involved in the Project implementation hierarchy.

Procurement needs will be identified initially for direct participants and, at the time of negotiating participation agreements, for each organization later associated with the Project. No deviation from AID Direct or MCC procedures is anticipated for these procurements.

2. Technical Assistance Procurement

a. PADC Technical Assistance

The PADC has already received long-term technical assistance in cooperative organization and agro-industry and marketing, and short-term technical assistance in regional planning, rural communications, and other areas related to implementation planning under the CRDP. Further long term technical assistance will be provided this institution in the areas of applied social science, irrigation/on-farm water management, environment, forestry, and farming systems research and extension under the amended CRDP. These latter TA activities will focus primarily on the Associated High Valleys, but

may also serve to strengthen the impact of work in the Chapare. Scopes of Work for key TA positions, plus a fuller description of probable technical assistance needs, are provided in Annex I. In addition to outside TA, Project management will be strengthened by: 1) contracting an AID PSC Project Coordinator, 2) reassigning the current Cochabamba-based Project Assistant as Associate Project Coordinator for the Chapare, and 3) contracting an Associate Project Coordinator for the Associated High Valleys region.

d. IBTA/Chapare Technical Assistance

IBTA/Chapare will continue to receive technical assistance to support its work under the CRDP. The present institutional contract, due to terminate on August 31, 1988, will be reviewed and the best mechanism to continue assistance to IBTA/Chapare will be identified and implemented.

E. Evaluations and Audits

1. Evaluations

The CRDP will be evaluated (by a joint AID/GOB team in 1988 and 1990 and externally in 1989) beginning in July 1988. The evaluations will focus on the effectiveness of Project organization, plus the appropriateness and impact of activities being implemented. This implies the assessment of social and economic factors, technology transfer, and institutional efficiency. A final external evaluation of the CRDP will be undertaken approximately two months prior to PACD, in June 1991.

The achievement of Project goals and the measurement of accomplishments and difficulties are closely linked. This is particularly true given the complex intermediate and end-of-project goals contemplated in the Chapare Project as redesigned. External mid-term and final evaluations will provide useful validation and corrections. However, goal achievement requires that project leadership establish an evaluation stance involving continual monitoring of critical variables and feedback from beneficiaries, participant PVOs and agencies, and project staff. The key to useful evaluation is participation by all whose actions affect project success.

Responsibility for initiating and sustaining this process will reside with the planning and communications division of the PACD under the supervision of the Social Science Advisor. Once the national and international project staff are in place, a short-term consultant will spend a two to three week period working with the team to establish a participatory, flexible evaluation process. This individual will return at intervals of approximately six months to ensure that the process is meeting project leadership's expectations.

2. Audits

The Amended Project will have a yearly in-house audit and a final external audit beginning in June 1991.

CHAPARE REGIONAL DEVELOPMENT PROJECT

Amendment No. 2

ANNEXES

- A. Logical Framework
- B. 611(e) Certification
- C. State and La Paz Cables
- D. GOB Three Year Anti-Narcotics Program Description
- E. Summary Report
- F. Expanded Analyses
- G. Selected Project Components: Detailed Activities
- H. Institutions Pre-Selected to Provide Technical Support to the Amended Project
- I. Project Technical Assistance Plans
- J. Maps

ANNEX "A" - PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Page 1 of 12

Project Title and Number: CHAPARE REGIONAL DEVELOPMENT 511-0543

Life of Project: From FY 83 to FY 90  
US Funding: 26.5 million

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><u>Goal:</u> To stimulate balanced economic development and an enhanced standard of living in the Chapare and in Associated High Valley (AHV) regions of Cochabamba through public and private sector participation, a diversified economic base and more equitable income distribution. This Project's components will facilitate the transition by Chapare coca farmers to legitimate economic activities.</p>	<p><u>Measurement of Goal Achievement:</u></p> <p>a. Income of Chapare residents equals the median for Bolivia by 1988. Increased agricultural and livestock production (include non-coca crops in Chapare).</p>	<p>a. Evaluations of various components of Chapare project.</p> <p>b. Data, reports and special studies initiated by PADC and USAID/Bolivia.</p> <p>c. Survey of farm families.</p> <p>d. GOB records and census.</p>	<p>a. Price incentives for foods and non-edible forestry production continue to be favorable.</p> <p>b. General economic conditions in the country will improve.</p> <p>c. Domestic and international markets for cash crops will continue to develop.</p>
<p><u>Project Purpose</u></p> <p>To modify and improve the agricultural and forestry production systems of farmers in the Chapare and Associated High Valley (AHV) regions in the Department of Cochabamba to respond better to diverse, profitable marketing opportunities provided under sustained, environmentally compatible medium technology production models.</p>	<p><u>Conditions that will indicate purpose has been achieved:</u></p> <p>1. Agricultural and Forestry Production:</p> <p>a. Research and Extension</p> <p>-Applied agricultural research and extension capacities (i.e IBTA Pairumani Center, established in the Chapare and AHV to promote improvements in production and diversified farming appropriate for the Chapare.</p>	<p><u>Key Assumptions:</u></p> <p>a. Periodic evaluation of project components.</p> <p>-Final project evaluation.</p> <p>-USAID/B Project Manager's periodic visits.</p> <p>-Regular reports of T.A. team members.</p> <p>-Yearly progress reports from SDBT.</p> <p>-Minutes from international tropical agricultural meetings.</p> <p>-Agricultural research organization records.</p>	<p>a. -Capability and willingness of the GOB to support a sustained development &amp; narcotics control effort.</p> <p>-The existence of an untapped agricultural growth potential in the Chapare &amp; AHV which is amenable to a regional development project of this nature.</p> <p>-Chapare and AHV farmers will be receptive to what the project has to offer.</p>

ARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	<ul style="list-style-type: none"> <li>-Complementary private sector research and place.</li> <li>-Diffusion of agricultural and forestry technical packages to improve the agro-forestry production of small farmers established in the Chapare and AHV.</li> <li>-System in place for responding to supply-demand relationships between production and marketing.</li> </ul>		<ul style="list-style-type: none"> <li>-No severe or prolonged weather or other environmental conditions occur which affect agricultural production.</li> </ul>
<ul style="list-style-type: none"> <li>b. Agricultural Credit</li> <li>-A self-sustained credit system established which includes realistic interest rates for both short and medium-term savings mobilization.</li> </ul>		<ul style="list-style-type: none"> <li>b.-Lending institution credit records.</li> <li>-Yearly progress reports from SDBT.</li> </ul>	<ul style="list-style-type: none"> <li>b.-Commercial Banks continue to be interested in development lending.</li> <li>-Coca prices go below costs of production as a result of interdiction efforts and farmers seek credit resources to develop alter native crops.</li> </ul>
<ul style="list-style-type: none"> <li>c. Natural Resources Management</li> <li>-Continued and increased protection of fragile land areas and ecological systems in the AHV.</li> <li>-Improved land use capability due to conservation measures.</li> </ul>		<ul style="list-style-type: none"> <li>c.-Final reports of natural resource management studies completed and submitted to USAID/B.</li> <li>-Regular reports of T.A. team members.</li> </ul>	<ul style="list-style-type: none"> <li>c.-Farmers are willing to participate in environmental protection activities and these activities are implemented.</li> </ul>
<ul style="list-style-type: none"> <li>2. Rural Industry &amp; Marketing</li> <li>-An information clearing house for local/regional markets established.</li> </ul>		<ul style="list-style-type: none"> <li>2.-Periodic evaluation of project components.</li> <li>-Final project evaluation.</li> <li>-USAID/B Project Manager's periodic site visits.</li> </ul>	<ul style="list-style-type: none"> <li>2.-The incentives for investment established by this project are sufficient to encourage firms to enter the economy.</li> </ul>

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	<ul style="list-style-type: none"> <li>-Procedures established for identifying, testing the feasibility of and financing both large and small scale agro-industry projects for the Chapare and AHV.</li> <li>-Commodity processing &amp; marketing systems established.</li> </ul>	<ul style="list-style-type: none"> <li>-Periodic field visits by USAID/B staff.</li> <li>-Yearly progress reports from SDBT.</li> <li>-Records of credit lending institutions.</li> <li>-Reports from private sector entities.</li> </ul>	
	<p>3. Productive, Transport &amp; Community Infrastructure</p> <ul style="list-style-type: none"> <li>-Increased productivity in farms due to provision of irrigation in AHV.</li> <li>-Improved water management practices being utilized.</li> <li>-Reduction in cost and time involved in passenger and commercial transportation because of the upgraded rural roads.</li> <li>-Improved market access for farmers.</li> <li>-Increased number of AHV dwellers using and benefiting from potable water and electrification systems.</li> </ul>	<p>3.-Reports of implementing organizations.</p> <ul style="list-style-type: none"> <li>-Periodic field visits by project staff.</li> </ul>	<p>3.-Sufficient water resources or irrigation and potable water systems.</p> <ul style="list-style-type: none"> <li>-Active participation of local farmers.</li> <li>-Efficient construction &amp; maintenance of rural roads by Bolivian counterpart execution organizations.</li> </ul>
	<p>4. Investment Fund</p> <ul style="list-style-type: none"> <li>-Systems established for identifying and evaluating subproject proposals for farmers' assistance in the AHV.</li> </ul>	<p>4.-Periodic evaluations of organizations funded comparing field results with target benchmarks of subproject proposals.</p> <ul style="list-style-type: none"> <li>-Yearly progress reports from PADC.</li> </ul>	<p>4. -Private voluntary organizations and public institutional operating in the AHV are willing and interested to participate actively in the project.</p> <ul style="list-style-type: none"> <li>-Organizations to be funded present to the project subproject proposals that address the needs of the AHV farmers.</li> </ul>

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NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

## 5. Institution Building

-An organizational structure established for managing the delivery of inputs and coordinating with the coca control program.

5.

-Final project evaluation.  
 -USAID/B project manager's periodic site visits.  
 -Reports of T.A. team members.  
 -USAID/B Controller's records of pari-passu performance.

-Yearly progress reports from SDB1 and IBTA/Chapare.

5.

-Interested organizations are willing to coordinate with the SDBT within the administrative framework set up in the project.

-COB provides its contribution on a timely basis.

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NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<u>Detailed Summary of Project Activities by Project Component</u>			
1. AGRICULTURE AND FORESTRY PRODUCTION			
A. Chapare Development Activities			
1. Research and Extension -Professional researchers, extensionists and para-professionals hired and trained.	95	1. Research and Extension -Periodic evaluations of project components. -Regular reports of T.A. team members. will be available to work with technical advisors.	A. GOB makes budget provision for and provides its contribution on a timely basis. 1. Research and Extension -Personnel available and willing to work in project area. -Qualified counterparts
-Technological packages applicable to ecology & agro-forestry potential of Chapare developed.	35	-USAID/B project manager's periodic site visits.	-Technical advisor hired on a timely basis.
-Model farms established throughout the region to serve as training and demonstration locations for farmers and para-technicians.	150	-Final project evaluation. IBTA records.	-Sufficient number of Chapare farmers interested in coming para-professionals.
-Farmer training sessions carried out.	162		-Small farmers willing to work with IBTA extension agents.
-Tech. transfer information messages produced and diffused.	253		
-Number of research, production and research subproject under execution.	1,312		
-Number of hectares in Chapare using genetic material produced in IBTA's research stations.	90,981		

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
2. Agricultural Production Credit -Production/Enterprise loans made in the Chapare region. -Credit specialists and community organization specialist hired and trained by the ICIs. -Short-term courses carried out.	4,242   33   7	2. Agricultural Production Credit -Financial institution reports.  -Reports of T.A. team members. -Periodic project evaluations. -SDBT yearly reports. -Final project evaluation.  -Chapare farmers will be prepared to obtain credit resources for developing perennial crops despite their long-term nature.	2. Agricultural Production Credit -Resources for loan capital becomes available as planned. -Farmers receptive to modifications in their farming systems. -Market exists for enhanced production.
Associated High Valley Activities			
1. Natural Resource Management -Reforestation hectares established within the upper reaches of the Uyuchama in the Vacas region. -Completion of studies carried out in regional resources, forest inventory and watershed management. -Forestry nurseries established. -Flood control structures for the towns of Mizque and Aiquile constructed.	540   3   2   2	1. Natural Resource Management -Cordeco/COTESU reports. -SDBT field evaluations. -Submission of study reports by organizations contracted. -USAID/B project staff site visits.	1. Natural Resource Management -AHV farmers willing to participate and cooperate in natural resource management activities. -Qualified contractors are identified to carry out required studies. -Cordeco/COTESU provides its counter-part funding on a timely basis.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
2. Agricultural Production		2. Agricultural Production	2. Agricultural Production
a. -Technological packages applicable to ecology and agro-forestry potential developed for the dry and irrigated areas of the AHV.	35	a. -Agricultural research organizations' records.	a. -Sufficient number of agricultural research organizations willing to participate in the project.
-Professional researchers, extensionists and paraprofessionals hired and trained.	110	-Reports of T.A. members.	-Small farmers willing to use improved genetic material
-Farmer training sessions carried out.	100	-SDBT yearly reports.	-and improved agricultural technologies.
-Tech. transfer information messages produced and diffused.	173	-Project staff site visits.	-Farmer supplies will be readily available at reasonable prices.
-Paraprofessional and professional research training sessions carried out.	63		-Research and extension personnel available and willing to work at the AHV.
-Professional research staff in receipt of short-term training abroad.	25		
-Comprehensive cropping systems and livestock management studies completed.	2		
-Inter-institutional agreement signed between the SDBT and at least 5 Bolivian agricultural research and extension organizations.	5		

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
b. -Production/Agricultural loans made in the AHV. -Credit specialists hired & trained by the ICIs. -Short-term credit courses carried out.	7,300  20  14	b. -Financial institution reports. -Existence of two BAB offices in the AHV. -Bank's files.	b. -BAB is restructured and financially rehabilitated, and is using sound credit and management policies/practices. -There is a high demand in the AHV for using the financial services to be offered by the BAB. -Markets exist for enhanced production.
II. RURAL INDUSTRY AND MARKETING			
A. Chapare Development Activities -One large scale swine agroindustrial project functioning. -One medium and two small scale agroindustrial projects functioning. -Agroindustrial pre-investment studies completed.	1  3  7	A. -Records of private sector companies.  -Periodic visits of USAID/B  -SDBT reports.	A. -Private entrepreneurs will be willing to invest in the Chapare. -Credit resources will be available as planned.  -Credit resources will be available as planned.
B. Associated High Valleys Activities -At least 15 marketing studies completed. -Agroindustrial loans disbursed.	15  100	B. -Study reports submitted by contracting companies. -ICI's records. -SDBT reports.	B. -Marketing companies with knowledge of and experience with external markets for crops produced in AHV will be identified and contracted.  -Sufficient number of entrepreneurs willing to invest in the AHV.
III. PRODUCTIVE, TRANSPORT AND COMMUNITY INFRASTRUCTURE			
A. Chapare Development Activities -Two electrification studies completed.	2	A. A. -Final study reports submitted by consulting companies.	A. -Reports submitted in a timely manner.
B. Associated High Valleys Activities -Irrigation pre-investment studies completed. -Professional irrigation staff in receipt of short term training abroad.	5  36	B. -Periodic site visits by project staff. -Reports of contracting companies. -SDBT reports. -SNC records.	B. -Sufficient water resources for irrigation and potable water systems. -Pre-investment studies are completed on a timely basis.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
-Short-term farmer train-irrigation courses carried out.	44	-Final evaluation.	-Active participation of AHV farmers in water management learned practices.
-Short-term in-country professional training irrigation courses carried out.	11		-Capable organizations are identified and contracted for constructing irrigation systems.
-Medium scale irrigation systems completed representing 470 new hectares irrigated.	2		-GOB makes budget provision for SNC and provides its contribution on a timely basis.
-Upgrade and rehabilitate the irrigation systems of 860 hectares.	860		
-Upgrade the electricity systems of Aiquile and Mizque.	2		
-Carry out an electricity pre-investment study.	1		
-Construction completed for rural potable water systems.	10		
-Improvement of of rural roads.	200 kms.		
-Construction completed for bridges.	8		
IV. INVESTMENT FUND		IV.	IV.
-Construction completed of irrigation systems for 1,230 new hectares.	1,230	-Reports of organizations being financed.	-Sufficient number of private public organizations interested in submitting subproject proposals to the project.
-Upgrade and rehabilitate the irrigation systems of 890 has.	890	-SDBT report.	-Interested organizations
-Inter-institutional agreements signed between the PADC and at least 15 organizations to assist the dwellers of the AHV.	15	-Field visits by USAID/B staff.	willing to participate actively in the project.
		-Annual project audits and evaluations.	-Subproject proposals fulfill the requirements set forth by the project.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
-At least 80 subprojects approved for financing the implementation of projects in the AHV.	80		
V. IMPLEMENTATION PLANNING STUDIES		V.	V.
-At least 10 planning studies (e.g. anthropological, agricultural and forestry) completed in the AHV to be used as baseline information for this project amendment.	10	-Final reports of studies submitted.	-Reports comply with the terms of the USAID/B contracts already signed.
VI. INSTITUTION BUILDING			
A. PADC		A.	A.
1.-Carry out reorganization creating a new division of planning, communication, and institutional development. -Decentralize the PADC by creating sub-regional offices in the Chapare and the Southern districts. 2.-PADC functioning as overall project coordinating body.	10	1.-USAID/B project staff visits. -Reports of T.A. team members. -Evaluations of budget and fiscal status. -SDBT reports. -SDBT's annual Operating Plans.	1.-Timely arrival of T.A. -Willingness of implementing agencies to cooperate in executing project.
		2.-An adequately staffed executive and administrative structure functioning to plan, monitor, and control the implementation of the Chapare Project and serve as its central coordinating entity. -Evidence of change occurring in the Chapare and AHV as a result of SDBT's project coordinating role.	2.-Authorization and appropriation of operating funds to meet its project responsibilities.

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## NARRATIVE SUMMARY

## OBJECTIVELY VERIFIABLE INDICATORS

## MEANS OF VERIFICATION

## IMPORTANT ASSUMPTIONS

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>B. IBTA</p> <p>-IBTA functioning as overall research and extension body serving the needs of Chapare farmers.</p> <p>-A staff of trained technology transfer technicians and administrators of sufficient number to extend new technologies to farmers in Chapare.</p> <p>-Professional staff in receipt of short-term training in tropical agriculture.</p> <p>-Professional staff in receipt of long-term training.</p> <p>-Professional researcher and para-professional training sessions carried out.</p>	<p>-A structure in place capable of delivering new technologies to 15,000 producer households in Chapare.</p> <p>18</p> <p>1</p> <p>143</p>	<p>B.</p> <p>-Periodic project evaluations.</p> <p>-USAID/B project staff visits.</p> <p>-IBTA's annual Operating Plans.</p> <p>-Final evaluation.</p>	<p>B.</p> <p>-Sufficient GOB counterparts to adequately staff IBTA.</p> <p>-New technologies are available throughout the life of the project.</p>
<p>C. SNC</p> <p>-SNC functioning as overall rural roads construction body.</p> <p>-Short-term seminars undertaken.</p>	<p>-An effective organizational structure capable of upgrading at least 200 kilometers of rural roads and constructing at least 8 bridges in the AHV.</p> <p>12</p>	<p>-Periodic project evaluations.</p> <p>-Reports of T.A. members.</p> <p>-Examination of budget and fiscal condition.</p> <p>-SNC's annual Operating Plan.</p> <p>-Final audit and evaluation.</p>	<p>-Sufficient GOB counterparts to adequately staff SNC.</p> <p>-SNC employees have the necessary incentives to work with enthusiasm and efficiently.</p>
<p>D. MACA/SSADCCS</p> <p>- Council established to provide overall policy guidance to narcotics related activities.</p>	<p>-Establishment of the legal basis for the National Council on Narcotics.</p>	<p>D.</p> <p>-Periodic project evaluations.</p> <p>-Project Master Plan.</p> <p>-Council's reports.</p> <p>-GOB legislation and decrees.</p>	<p>D.</p> <p>-Existence of mandate from GOB to carry out responsibilities.</p> <p>-GOB willingness to undertake development effort of this nature.</p>

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NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

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VII. EVALUATIONS/AUDITS

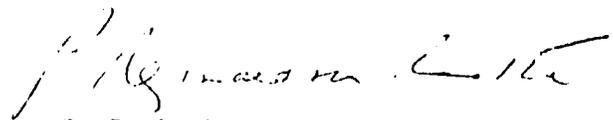
- Project implementation evaluations carried out.
- Project audits undertaken

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ANNEX B

Certification Pursuant to Section 611 (e) of The Foreign  
Assistance Act of 1961, As Amended

I, G. Reginald van Raalte, the principal officer of the Agency for International Development in Bolivia, having taken into account among other factors the maintenance and utilization of projects in Bolivia previously financed or assisted by the United States, do hereby certify that in my judgement Bolivia has both the financial capability and human resources capability to effectively maintain and utilize the capital assistance project: Chapare Regional Development, Amendment No. 2.



G. Reginald van Raalte  
Director, USAID/Bolivia

November 23, 1987

ANNEX C

State & La Paz Cables re Project Paper Amendment/  
Narcotics Strategy

UNCLASSIFIED Cables STATE 385148, LA PAZ 11824, and STATE 65511 are attached.

CLASSIFIED Cables LA PAZ 10184 dated November 26, 1986, LA PAZ 9546 dated October 6, 1987 and LA PAZ 9548 dated October 7, 1987, are available from Central Files, AID/W and USAID/Bolivia.

AID AMB DCM

Rec'd 12/14

R WVZCZCLP0081

File: PD&I

LOC: 402 075  
12 DEC 87 0120  
CN: 48561  
CHRG: AID  
DIST: AID

OO RUEHLP  
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ZNR UUUUUZHZH  
O 120122Z DEC 87  
FM SECSTATE WASHDC

Action: ARD  
Info: A/D  
EXO  
PD&I/CONT  
C/RF 3/ SF

TO AMEMBASSY LA PAZ; LIMA IMMEDIATE IMMEDIATE 3176

LA PAZ 12577

BT:  
UNCLAS STATE 385148

Reply due 12/15  
Action tkn

*Rabell*  
*did 12/16*

AIDAC LA PAZ FOR HESS, LIMA FOR REMS/SA HOWARD CLARK

E.O. 12356:6: N/A

TAGS:

SUBJECT: PREPARATION OF ENVIRONMENTAL ASSESSMENT FOR AMENDMENT NO. 1 FOR CHAPARE REGIONAL DEVELOPMENT PROJECT

REFS: (A) LA PAZ 11824, (B) HESS/HESTER TELCON 12/7/87

1. CEO HESTER APPRECIATES MISSION URGENT NEED TO DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR IMMEDIATE ACTIVITIES IN ELIGIBLE COMMUNITIES IN THE CHAPARE, FOLLOWING ERADICATION OF EXISTING COCA FIELDS. IN REFTEL (A), MISSION STATED PLANNED ACTIVITIES INCLUDE STUDIES FOR PLANNED IMPROVEMENT OF 14 KILOMETERS OF FARM TO MARKET ACCESS ROAD, PLANTING LEGUMINOUS GROUND COVER, EXPANDING THE PRODUCTION OF TRADITIONAL AND NON-TRADITIONAL CROPS, AGRICULTURE CREDIT EXTENSION, AND HOG FATTENING.

2: IN REFTELCON (B) MISSION REQUESTED ASSISTANCE IDENTIFYING ISSUES TO BE ADDRESSED IN EA AMENDMENT NO. 1 FOR CHAPARE REGIONAL DEVELOPMENT PROJECT (CRDP). WITH RESPECT TO ACTIVITIES PROPOSED ABOVE, THE FOLLOWING MAJOR ISSUES SHOULD BE TREATED:

- ROADS: THE DIRECT IMPACT OF ROAD REHABILITATION,

IMPROVEMENT AND MAINTENANCE INCLUDE EROSION, WATER QUALITY, AND DOWNSTREAM EFFECTS FROM CHANGES IN DRAINAGE. ROAD CONSTRUCTION MATERIALS AND SOURCE OF FILL NEED TO BE ADEQUATELY SELECTED NOT ONLY TO PROVIDE LONG TERM ROAD USE, BUT ALSO TO PREVENT ANY IMPACT ON THE SOURCE AREA. ALTHOUGH PERHAPS NOT AN IMPORTANT CONSIDERATION IN THE PRESENT INSTANCE, INLIRECT IMPACTS OF ROAD IMPROVEMENT AND MAINTENANCE ACTIVITIES THAT NEED TO BE ANALYZED INCLUDE THE CHANGES IN LAND USE DUE TO SPONTANEOUS COLONIZATION, POTENTIAL INCREASED DEFORESTATION AND LOSS OF BIOLOGICAL DIVERSITY, AND INCREASED POPULATION PRESSURE IN CLOSE PROXIMITY TO WATERSHEDS.

- PESTICIDES: SOWING FIELDS WITH (NATIVE) LEGUMINOUS GROUND COVER, AND THEN EXPANDING THE PRODUCTION OF TRADITIONAL AND NON-TRADITIONAL CROPS MAY RESULT IN INCREASED USE OF FERTILIZER AND PESTICIDES, PROVIDING A

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POTENTIAL HAZARD FOR ENVIRONMENTAL CONTAMINATION AS WELL AS PUBLIC HEALTH: IT IS THUS IMPORTANT TO PERFORM AN ENVIRONMENTAL ASSESSMENT FOR PESTICIDE USE PER OUTLINE IN FEDERAL REGULATION TITLE 22 CFR 216.3(B) (REG. 16). SALIENT POINTS TO BE ADDRESSED INCLUDE IDENTIFICATION OF THE SPECIFIC PESTICIDES TO BE USED, TARGET EFFECTIVENESS, TOXICITY SPECTRUM, PERSISTENCE, QUANTITIES TO BE USED, METHOD OF APPLICATION, SAFETY OF WORKERS AND ALLIED POPULATION, AND ENVIRONMENTAL CONDITIONS UNDER WHICH THE PESTICIDES ARE TO BE USED. TRAINING AND INTEGRATED PEST MANAGEMENT PROGRAMS SHOULD BE ELABORATED AND ENCOURAGED.

- CONSERVATION OF TROPICAL FORESTS AND BIOLOGICAL DIVERSITY: ALTHOUGH NOT CRITICAL ISSUES FOR PRESENT PROPOSED ACTIVITIES, THE LOSS OF TROPICAL FORESTS AND BIOLOGICAL DIVERSITY IS AT PRESENT AN IMPORTANT AREA OF CONCERN AND THE EA AMENDMENT SHOULD BE CAREFUL TO INDICATE HOW PROJECT ACTIVITIES ARE IN COMPLIANCE WITH SECTIONS 118 AND 119 OF THE FOREIGN ASSISTANCE ACT TO CONSERVE TROPICAL FORESTS AND BIOLOGICAL DIVERSITY.

3: CEO HESTER SUPPORTS MISSION PLAN TO DEVELOP IN-COUNTRY CAPABILITIES, UNDER ORGANIZATIONS SUCH AS CUMAT, TO CONDUCT ENVIRONMENTAL ASSESSMENTS FOR FUTURE PROJECT AMENDMENTS. AID/W FURTHER UNDERSTANDS THAT MISSION WILL SOON HAVE IN PLACE AN ENVIRONMENTAL ADVISER UNDER A DESFIL BUY-IN WHO WILL PROVIDE FURTHER ASSISTANCE IN THIS AREA.

4: PER REQUEST IN REFTELCON (B), AID/W HAS SENT COPY OF BOOK TITLED ENVIRONMENTAL DESIGN CONSIDERATIONS FOR RURAL DEVELOPMENT PROJECTS, BY DHL TO MISSION. THIS DOCUMENT, ALTHOUGH SOMEWHAT DATED, SHOULD BE USEFUL IN IDENTIFYING AREAS OF POTENTIAL ENVIRONMENTAL CONCERN WHICH MAY ACCOMPANY RURAL PROJECTS, AND BE OF ASSISTANCE IN PREPARING FUTURE EA AMENDMENTS FOR ACTIVITIES TO BE IMPLEMENTED UNDER THE CRDP. WHITEHEAD

BT  
#5148

NNNN

VZCZCLPI \*  
OO RUEHC  
DE RUEHLP #1824 334 \*\*\*  
ZNR UUUUU ZZH  
O 302159Z NOV 87  
FM AMEMBASSY LA PAZ  
TO SECSTATE WASHDC IMMEDIATE 3727  
BT  
UNCLAS LA PAZ 11824

ANNEX C

CLASS: UNCLASSIFIED  
CHRG: AID 11/30/87  
APPRV: A/D:GAWACHTENNEEJF  
DRFTD: ARD:DWHESS:BT  
CLEAR: ARD:JAFASULLO  
DISTR: USAID AMB DCM  
ECON

AIDAC

FOR LAC/CEO J. HESTER AND REMS/SA HOWARD CLARK

E.O. 12356: N1A  
SUBJECT: ENVIRONMENTAL ASSESSMENT AMENDMENT NO. 1 FOR  
- CHAPARE REGIONAL DEVELOPMENT PROJECT.

ARD

REF.: HESS-CLARK TELECON 11/25/87

1. USAID/BOLIVIA APPRECIATES OFFER IN REFTTELECON OF ASSISTANCE OF REMS/SA CLARK FOR DRAFTING AND RECOMMENDING APPROVAL OF EA ASSESSMENT FOR IMMEDIATE ACTIVITIES IN ELIGIBLE COMMUNITIES IN THE CHAPARE, I.E. THOSE WHO ARE CERTIFIED AS HAVING RATIFIED 70% OF THEIR EXISTING COCA FIELDS. THE FIRST SUCH CASE IS THE VILLA NUEVA AREA WHICH HAS ERADICATED APPROXIMATELY 350 HECTARES OF COCA (70%). IMMEDIATE ACTIVITIES INCLUDE THE TECHNICAL STUDIES FOR AN ACTUAL IMPROVEMENT OF 14 KILOMETERS OF FARM TO MARKET ACCESS ROAD, THE SOWING OF A PORTION OF THE ERADICATED HECTARES WITH LEGUMINOUS GROUND COVER, THE EXPANSION OF CULTIVATION OF PERENNIAL AND ANNUAL CROPS, AND THE PROMOTION OF PIG FATTENING BY ELIGIBLE FARMERS. WE WILL BEGIN TO COLLECT AND ANALYZE INFORMATION WHICH WE JUDGE AS IMPORTANT FOR THE EA AMENDMENT BUT WE WILL NEED IMMEDIATE ADVICE FROM YOU BY NO LATER THAN DECEMBER 4 ON ALL FACTORS WHICH SHOULD BE CONSIDERED. WE UNDERSTAND THAT REMS/SA WILL BE CONSULTING WITH LAC/CEO UNTIL ABOUT DECEMBER 11 AND OUR INTENTION IS TO PROVIDE THE EA AMENDMENT BEFORE THAT DATE TO FACILITATE LAC/CEO APPROVAL. PLEASE ADVISE.

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TAGS:

SUBJECT: CHAPARE REGIONAL DEVELOPMENT PROJECT AMENDMENT  
NO. 5

Reply due 3/9

REFS: (A) LA PAZ 01712 (B) JORDAN/WACHTENHEIM TELCON  
2/27/87 (C) LA PAZ 01324

Action tkn *oable dated 3/10*

PER REF B WE ACKNOWLEDGE NEED FOR MISSION TO ACT EXPEDITIOUSLY ON REPROGRAMMING OF CHAPARE PROJECT IN CONTEXT OF OVERALL USG-GOB NEGOTIATIONS ON NARCOTICS CONTROL ASSISTANCE PACKAGE. MISSION MAY PROCEED WITH SIGNATURE OF PROJECT AGREEMENT AMENDMENT PROVIDED THAT RLA OR GC/LAC HAS CLEARED THAT OF SUBJECT AMENDMENT. HOWEVER, A CONDITION PRECEDENT SHOULD BE INCLUDED IN THE AMENDED AGREEMENT WHICH REQUIRES THAT THE NECESSARY TECHNICAL, INSTITUTIONAL, SOCIAL AND FINANCIAL ANALYSES FOR ACTIVITIES FINANCED UNDER THE NEW INFRASTRUCTURE AND ON-FARM IMPROVEMENTS LINE ITEM BE COMPLETED PRIOR TO DISBURSEMENT. THE CP MAY BE INCLUDED EITHER TO APPLY CATEGORICALLY FOR THE HIGH VALLEY AREA OF COCHABAMBA OR INDIVIDUALLY TO SPECIFIC ACTIVITIES FINANCED UNDER THIS LINE ITEM, WHICHEVER OPTION WILL FACILITATE PROJECT IMPLEMENTATION.

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IN ADDITION THE MISSION SHOULD PREPARE AND APPROVE A PP AMENDMENT UPON COMPLETION OF AFOREMENTIONED STUDIES. IN COMPLETING THIS PP AMENDMENT, THE MISSION SHOULD INCLUDE A REVISED PROJECT DESCRIPTION WITH COST ESTIMATES SUFFICIENT TO FULFILL 611 REQUIREMENTS AS WELL AS A REVISED IMPLEMENTATION PLAN. THE MISSION SHOULD ALSO CONSIDER THE FOLLOWING OBSERVATIONS:

*How can we sign amendment since that AID/W P.T. in this in*

--1) THE REVISED COST ESTIMATE AND FINANCIAL PLAN PROVIDED TO LAC/DR DID NOT INCLUDE COUNTERPART CONTRIBUTIONS OR LOCAL CURRENCY PROVIDED BY THE PL 480 TITLE III SECRETARIAT. AS A RESULT, IT WAS DIFFICULT TO IDENTIFY THE SOURCES, AMOUNTS AND USES OF FUNDS DESCRIBED IN THE AMENDED ANNEX I. OF PARTICULAR CONCERN IS THE SOURCE AND AMOUNT OF LOCAL CURRENCY FOR PRODUCER AND AGRO-INDUSTRIAL CREDIT. THE PL 480 TITLE III WORKPLAN, REFC, ALLOCATES ONLY DOLS 500,000 WHILE ANNEX I EARMARKS DOLS 7 MILLION.

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-2) INSTITUTIONAL ROLES/RELATIONS RELATIVE TO THE NEW ACTIVITIES IN THE HIGH VALLEYS OF COCHABAMBA ARE NOT WELL EXPLAINED IN THE AMENDED ANNEX I. HAVE IBTA/COCHABAMBA (AG. RESEARCH AND EXTENSION) AND CORDECO (IRRIGATION SYSTEM REHABILITATION/EXPANSION) AGREED TO COOPERATE MORE CLOSELY WITH SDBT THAN IN THE PAST? GIVEN THE NEWLY EXPANDED AREA OF THE PROJECT, WILL THE ROLE AND COMPOSITION OF CODICH REMAIN THE SAME?

--3) THE WISDOM OF NEW/CONTINUED EFFORTS AT THE CHIPIRIRI EXPERIMENT STATION IS QUESTIONABLE IN LIGHT OF THE EVALUATION REPORT FROM SEPTEMBER 1986. WHAT IS THE RATIONALE FOR THIS USE OF FUNDS OVER OTHER POSSIBLE USES IN THE CHAPARE OR THE HIGH VALLEYS?

--4) THE REQUIREMENTS FOR CHAPARE COCA FARMERS TO RECEIVE PROJECT BENEFITS IN THE HIGH VALLEY REGION IS NOT CLEAR. IS THERE A QUID PRO QUO AGREEMENT INVOLVED OF COCA ERADICATION FOR PROJECT BENEFITS? IF SO, THIS SHOULD BE CLEARLY DEFINED FOR POTENTIAL PROJECT BENEFICIARIES ON AN A PRIORI BASIS. WHITEHEAD

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ANNEX D

BOLIVIA

THE GOVERNMENT OF BOLIVIA'S THREE-YEAR ANTI-NARCOTICS PROGRAM  
SUMMARY INFORMATION PRESENTED AT THREE INTERNATIONAL CONFERENCES  
BETWEEN DECEMBER 1986 AND MARCH 1987

Translation from GOB report.  
April 1987

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I. INTRODUCTION

It is difficult to understand the current situation of Bolivia without taking into account the problem of drug trafficking, which economically, politically, and socially distorts the entire society. There are several important considerations brought about by cocaine trafficking which cannot be ignored domestically or internationally. The worldwide increase in the demand for drugs, combined with the deepening of the economic crisis of the country, generated the favorable conditions to promote the ever increasing production of coca.

The basic ingredient required for cocaine processing is the coca leaf, which by itself, has no major harmful effects and has been traditionally cultivated and used by the Andean civilizations. The ever increasing international demand for drugs, combined with our high unemployment rate and the availability of large tracts of unoccupied and fertile land, has resulted in an explosive increase of coca production. This production exceeds by far the demand for traditional consumption and it is obviously used for cocaine elaboration.

Drug trafficking endangers the stability of the government and tends to convert this illegal activity into a parallel power that threatens to rival the government itself. This is the result of the large amount of resources it controls, which permits drug traffickers to penetrate the different social and institutional structures of the country.

The social harm that is created by this problem is demonstrated by the alarming increases in drug addiction, juvenile delinquency, prostitution and in general, by the loss of traditional national values. The eradication of this activity is an ethical and moral necessity of national and international proportions. Criminals must not be allowed to take advantage of society to obtain their illegal profits.

The drug trafficking problem is much more serious on the international level. This is evidenced by the existence of powerful economic groups of unknown origin involved in a wide range of activities, the social degeneration in the developed countries, and the high incidence of drug addiction.

Even if the Bolivian society has reached consensus regarding the problem of narcotics, it will be impossible to eradicate the scourge of drug trafficking only with Bolivian resources.

To eliminate this problem, it is essential to have massive and decisive support from the international community. Bolivia has already undertaken decisive action to rid itself of narcotics.

These efforts are evident today. Since July of this year, various interdiction activities against drug trafficking centers have been carried out with the cooperation of the government of the United States. These activities

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have been undertaken at a high political cost to the national government due to the presence of foreign troops in our country. Nevertheless, the Government is convinced that only through measures like these can this problem which afflicts humanity be solved.

Failure to confront the problem of drug trafficking in a determined manner will unquestionably result in higher costs for Bolivia and the international community at a later time.

Guided by this principle, the government and the people of Bolivia ask this forum to consider carefully this document describing our Three Year Anti-Narcotics Program.

## II. THE PROBLEM OF DRUG TRAFFICKING IN BOLIVIA

### a. The Production and the Consumption of Coca

The production of cocaine uses a basic ingredient (the coca leaf) that has no major harmful properties. Coca has been cultivated in micro-regions of the Andes since time immemorial. Chewed in combination with activating ingredients such as ash, it supposedly wards off fatigue and hunger by its effects on the digestive system. It also has anesthetic properties, which may relieve certain types of pain.

The chewing of coca has always been a distinctive feature of the Andean cultures and has been surrounded by religious and magical undertones. In the period of colonization and during the first years of the Bolivian Republic, its consumption was encouraged to increase the production of manual labor used for agriculture and mining.

Today, although the practice of coca chewing is not so widespread, it remains a custom among mining and farming populations. In urban areas the use is much lower, with most applications limited to the preparation of a digestive tea. The coca leaf is also marketed internationally in small quantities as an ingredient in pharmaceuticals.

Bolivia's traditional coca production regions are mainly located in the northern and southern areas of the Yungas in the Department of La Paz. These areas are of relatively low altitude (between 1,200 and 2,000 meters above sea level), have steep slopes, and are suitable for the production of coffee, citrus, and other tropical fruits. In these regions, coca is highly valued for traditional use because it has a low alkaloid level and thus is more desirable for chewing.

The most suitable lands for coca used for the production of cocaine are at lower altitudes, where the leaf produced has a high alkaloid level. Such characteristics are typical of the Chapare province in the Department of Cochabamba and, to a lesser extent, other vast regions of Bolivia. Because the region is more level and has fertile soils, the production of coca in Chapare enjoys lower costs and higher productivity than in the Yungas region. The production of coca per hectare in the Chapare is six times higher than in the traditional area of the Yungas.

As the traditional consumption of coca diminished, the production of coca also tended to decline. In the Yungas region, the production of coca in 1975 (which is the year that marks the beginning of the new growth trend in production), amounted only to 50% of the average of the previous 20 years. However, coca production in Chapare beginning in the early 1970s showed an unusual increase. Between 1980 and 1986, this increase resulted in an average annual growth rate exceeding 35%. In less than 15 years, Chapare replaced Yungas as the most important area in coca production. Presently, Chapare produces more than 90% of the total Bolivian coca crop.

In a short period, the use of this product changed radically. Until 1975, the level of production and the level of traditional consumption were practically equal. Now, traditional consumption amounts to only 10% of the total production. The remaining 90% is used for the production of cocaine.

This phenomenon can be explained in two ways. First, the increased international demand for cocaine, particularly from the United States and Europe. And second, the worsening of the economic crisis in Bolivia. The economic situation induced people from important farming centers, as well as unemployed city dwellers and miners, to move to coca-producing regions. The benign neglect of this problem in the past allowed the narcotics trade to develop to its present level.

b. Economic Impact of Drug Trafficking

Between 1980 and 1986, the average real growth rate of coca production in Bolivia was 35%. This can be contrasted with the -2.36% GDP growth rate of the formal sector of the economy during the same period. This comparison shows the growing importance of drug trafficking in the Bolivian economy.

Between 1980 and 1986, the number of cultivated hectares of coca grew by 240%, representing an estimated area in 1986 of 70,000 hectares. These 70,000 hectares represent less than 1% of the Bolivian territory, but constitute 35% of the potential growing area for coca cultivation.

In 1978, the number of families that cultivated coca was 15,000; in 1986, this figure rose to 70,000. The largest percentage of these families (approximately 85%) are located in the Chapare region of the Department of Cochabamba and the remainder in areas of the Yungas in the Department of La Paz. These figures show a population growth rate of 366% between 1978 and 1986, which corresponds to an annual growth rate of 21%, with most of this population devoted mainly to coca production. In contrast, the open unemployment rate between 1980 and 1986 rose from 5.7% to 20%. As a consequence, the Chapare region has become vastly overpopulated on land which can sustain such a large number of people only through the high return on coca cultivation.

Since the average number of members in each family is five, there are 350,000 people involved in this activity. This means that in 1986, almost 5% of the Bolivian population depended directly on the production of coca. With respect to the economically active population, less than 6% is involved in this activity.

If the increase of coca production is calculated into the growth of the agricultural sector between 1980 and 1986, the growth rate is 61% but without the inclusion of this factor, the growth rate is only 4%.

It is estimated that in 1986, the gross value of the production of cocaine in Bolivia was between US\$2.0 and \$2.5 billion, which represents approximately 450 metric tons of cocaine. It is interesting to note that the aggregate value of coca in 1986 only amounted to US\$230 million, which means that the gross export capital value was between US\$1.78 and 2.3 billion. The gross value of cocaine production, which is a good estimator of the GDP of this activity, reached a value between 53% and 66% of the GDP of the formal economy in 1986; and it represented between 3 and 4 times the value of the formal national exports.

Despite the difficulty of estimating the production values of the drug trade, the aforementioned figures show the great extent of economic activity and investment in this area, despite the weakness of the Bolivian economy.

The production of coca and its processing into cocaine represent for the Bolivian economy a serious problem in the distribution of resources. This is caused by the fact that this activity offers profits far in excess of other legal economic activities.

The distortion of resource distribution not only has a micro-economic impact with respect to economic profits, but it also has a macro-economic impact with respect to aggregate prices. For example, it causes the Bolivian Peso to be overvalued, and this causes a negative impact on the production of goods to be sold abroad. It also provides incentives for imports (especially of luxury goods), and encourages contraband, which harms national industry. Another clear example of this distortion can be seen in salaries. In the formal sector they amount to an average of US\$ 80 monthly. For farmers involved in drug trafficking, this salary level is multiplied by five or sixfold at a very conservative estimate.

The macro-economic distortion has been amply demonstrated during the heyday of the growth of drug-related activity.

The impact of cocaine trafficking on the Bolivian economy is not only reflected by the aforementioned alarming indicators. Estimates of the Balance of Payments (BOP) for 1986 show the impact of drug trafficking on the economy with respect to the flow of foreign exchange. The "Errors and Omissions" column of the BOP shows a positive balance of US\$ 175 million, which could be largely attributable to drug-related activities. This figure only accounts for the drug-related capital that formally enters into the legal economy.

The expansion of drug trafficking, instead of benefitting the economy, has threatened and eroded the government's power to manage the political economy, since more resources are derived from this illegal activity, and the government has no means to manage or control them.

If the behavior of the Total Liquidity (M2) of the economy is examined, we see that approximately US\$680 million were required for the economy to operate. Due to hyperinflation and the amount of "narco dollars," in 1986, the economy operated with a legal M2 of only US\$340 million. This meant that approximately an additional US\$200 million were directly or indirectly provided by drug trafficking.

As a result of this problem, the structural distortions in consumption become even greater and distort the production apparatus of the economy. The creation of a tertiary economy and the weakening of the primary and secondary sectors are results of this problem. In 1986, the tertiary sector of the economy accounted for more than 55% of the GDP. On the other hand, uncontrolled informal business manages approximately US\$350 million, which represents roughly 80% of the amount managed by formal business. In addition, contraband imports have reached an annual average value of US\$300 million, which represents between 40% and 60% of total legal imports.

The increasing importance of drug trafficking in the Bolivian economy contributes to making income distribution more regressive. This is due to the fact that the large majority of the Bolivian population must bear the burden of the economic crisis, while the population involved in drug activity enjoy a much higher standard of living, comparable to the living standards of upper income levels of developed countries.

#### c. Political Impact of Drug Trafficking

To limit a discussion of the effects of drug trafficking solely to the arena of economics, would be seriously naive and could lead one to believe that this activity offers a feasible means of solving the economic crisis. On the one hand, the drug trade generates employment, while on the other it mobilizes a large amount of resources which could conveniently be used to strengthen the country's economy. However, the most harmful long term effects of this activity can be observed in the political arena. Currently, the magnitude of drug trafficking is so great that it threatens the stability of the country's entire governmental apparatus. The temptation to become involved in corrupt practices within drug control organizations and legal institutions is perhaps the most obvious of these effects.

There are signs that indicate that drug trafficking could have penetrated a variety of institutions, including the media, farmer unions, civic groups, and even athletic clubs. These institutions consciously or unconsciously can aid in this illegal activity and permit the proliferation of drugs in their areas of influence.

It is not absurd to think that, in the near future, even the most important powers of the government may fall under this influence. There is great concern that the resources generated by these illegal activities may be used in a manner to systematically corrupt the government itself.

Nevertheless, a frontal assault on drug trafficking which does not take into account the economic loss incurred by the coca-producing population is also off-target. The negative social impacts that this would generate would endanger the democratic stability of the country. These negative impacts could be used by the drug traffickers themselves, to incite the population against the legal government. In bordering countries, there exists mounting evidence of ties between drug trafficking and subversive guerilla groups.

It is for these reasons that action on various fronts should be undertaken. The repression of this activity and the provision of alternative means of subsistence for coca producers are the central elements of a necessary plan of action.

#### d. Social Impact of Drug Trafficking

In addition to the political and economic impacts created by drug trafficking, the social problems have also reached an alarming level.

The Chapare region is experiencing a wave of violence and a high incidence of drug-related crimes and social diseases. The behavior of the people in this area dominated by drug trafficking is characterized by alcoholism, prostitution, easy profits from illegal money, money laundering, robbery, alienation, and distortion in normal consumption patterns. This environment generates extremely dangerous impacts on the youth.

The problem of social degeneration in the Yungas is less than that of the Chapare. Nevertheless, migration to low altitude areas where coca is grown to process cocaine is increasing, and endangers the economy of these areas in the aforementioned ways.

Obviously, the social effects of drug trafficking are worst in the zones of production, principally the Chapare. Drug addiction has increased noticeably, especially among the youth. While surveys indicate that more than 1% of the total population may be addicted, the more alarming figure is among the youth. According to national studies on the consumption of drugs among the Bolivian youth, in 1985, 11% of the population between 12 and 25 years were habitual consumers, and 8% were occasional consumers.

Another phenomenon which is closely related to the increased drug addiction in Bolivia is the growing participation of youth in the marketing of this product, which is just as prevalent in the rural sector as it is in the urban. More and more children who do not have enough money to purchase the drug are selling it in cities and small towns in exchange for a dose to satisfy their personal needs.

III. THE FIGHT AGAINST DRUG TRAFFICKING

a. Past Experience

In the past, the fight against drug trafficking has been carried out sporadically without coordination between interdiction components and development projects.

Interdiction efforts have not been efficient, principally due to a lack of resources for expansive and permanent action. Since these efforts have been sporadic, they have brought about sharp growth of cultivation areas and increases in the price of coca. Even though interdiction efforts have been limited, development projects have continued in areas affected by drug trafficking, principally the Chapare.

In the Chapare, since 1984, there has been a development project which seeks to facilitate coca eradication while also attempting to improve living standards. The project conditions assistance on beneficiary cooperation with narcotics control laws and authorities, and promotes the development of crop alternatives for those who wish to reduce their economic dependency on coca cultivation. Infrastructure improvement programs, as well as the development of agroindustrial projects, are similarly conditioned. The promotion of crop alternatives has not reached a significant level of acceptance because of the high profit which coca produced -- in the absence of an effective control program. The development of infrastructure, in fact, actually risked making work easier for drug traffickers. Meanwhile investor risks involved in carrying out legal activities in this dangerous zone discouraged the progress of agroindustrial projects. The limited achievements of the project can be explained by the lack of effective interdiction, and by the growing demand for coca. This reliable, remunerative demand resulted in strong incentives for increasing coca production.

b. Interdiction

The Three Year Anti-Narcotics Program arises from understanding past experience and emphasizes the importance of interdiction in reducing the profitability of coca production. Development projects will be designed to offset the many effects caused by the reduction in crops. A strong interdependent relationship exists between interdiction components and development projects.

Together with these programs, it is relevant and important to note the national consensus that must exist to take on the fight against, and the destruction of, the narcotics scourge. Given the public's increasing sensitivity and opposition to narcotics in Bolivia, one can feel optimism in this respect. In this sense, the government is committed to carrying on the fight against narcotics relentlessly.

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The Government of Bolivia, with the support of the United States, has initiated a new stage in interdiction activities. The results of this operation are highly satisfactory, but, by necessity, they must be expanded and maintained over a long period with the help of other countries and international organizations. Achievements to date include the destruction of laboratories, the seizure of large volumes of coca paste and cocaine, and intervention at transfer points. The most significant result has been the notable reduction in the price of coca and the near paralysis of the laboratory production process.

The price of a "carga" of coca leaf (100 pounds) was reduced between July and September 1986 from 140 to 10 dollars, a price much lower than the cost of production, which is approximately 40 dollars. This reduction in price, a result of interdiction, also had the effect of increasing demand for crop substitution credit in the Chapare region.

c. Legal Measures

The fight against drug trafficking undertaken by the Bolivian Government must be intensified and consolidated through permanent and efficient policies resulting from increased national awareness.

With this objective, the Bolivian Government has presented legislation to the National Congress that will provide a juridical instrument -- reflecting national consensus -- for fighting drug traffic.

The central part of this legislation seeks to prohibit the cultivation of coca throughout the country, including the Chapare, with the exception of the traditional areas in the Yungas, where conditions are neither the most apt nor the most profitable for coca production, and where coca will be used solely for domestic traditional (i.e. legal) consumption. For this reason, the legislation will prohibit introducing, possessing or storing any type of chemical precursors in the areas where coca production is permitted.

Approval of this law by Congress will achieve support and essential political consensus for a successful fight against drug trafficking. In addition, it will provide the government with greater capacity to manage the problem.

IV. PLAN FOR AGRICULTURAL CONVERSION, ECONOMIC REACTIVATION, AND REGIONAL DEVELOPMENT

The fight against drug trafficking cannot be totally effective using only force to prevent the cultivation of coca leaves and interrupting thereby the production of cocaine. Force should be accompanied by other means which provide suitable, legal income sources for the farmers involved in coca cultivation. If this is not done, there is a danger that social unrest might later threaten democratic stability or lead farmers to continue illicit coca production in areas where control is more difficult and less effective.

For this reason, mechanisms should be created in the economic plan for regional development and agricultural conversion which will eliminate coca cultivation for illegal purposes without destroying social and economic equilibrium in the producing areas. In this context, the government is carrying out various actions which are still incomplete because of the lack of necessary financial resources. Therefore, the plan described herein is being submitted to this distinguished forum. This plan is designed to mobilize the necessary international resources for eliminating the cultivation of illegal coca.

The plan has four components: a) agricultural conversion (i.e. replacement) of coca cultivation; b) the creation of a credit fund for economic reactivation, to provide financial resources for other permanent productive activities; c) the Regional Development Plan, designed to create the necessary infrastructure to carry out the previous tasks and, d) the Plan for Prevention and Rehabilitation of Drug Addicts, to assist those affected by the use of narcotics.

A. Agricultural Conversion Program (US\$100,000,000)

The Agricultural Conversion Program seeks to eliminate cultivation of coca for the illegal market by creating the conditions necessary to encourage the coca producers to become involved in the cultivation of other products. The Program is composed of two stages of coca eradication, which will be undertaken sequentially: the first voluntary and the second mandatory.

The government's objective is that the majority of the farmers who cultivate coca will agree to voluntary eradication. For the success of the voluntary eradication program, there are two essential conditions. First, the government must have sufficient funds, on a timely basis, to support the farmers with the necessary resources required for a transition to new economic activities. Second, interdiction activities must work effectively, so that they produce a significant reduction in the profitability of coca production on the national market.

1. Voluntary Crop Elimination

This phase anticipates the creation of a Family Rehabilitation Fund of one hundred million dollars (US\$100,000,000). The object of this fund is to provide families in the program with an amount of money which will allow them to reorient their source of support, when faced with a prohibition on the cultivation of coca.

The amount for this fund was established by taking the total area, 50,000 hectares, of non-traditional coca cultivation destined for cocaine production. For each hectare eliminated by the farmer, he will be authorized two thousand dollars (\$2,000), the minimum amount necessary for a family of five to eradicate their coca and reestablish themselves in other economic endeavors. It is estimated that in the voluntary phase, the major portion of the cultivated area will be eradicated. It is important to clarify that this amount is less than the investment needed to replace the coca crop, which is meant to ensure that the farmer will not return to coca cultivation.

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The time period for voluntary crop eradication will be twelve months. Money will be given to farmers automatically once total crop eradication has been verified. The sum provided to the farmer will help him to establish new means of earning his income.

ii) Mandatory Crop Eradication

After facilitating voluntary crop eradication over a period of twelve months, the government will proceed to eradicate through force the coca fields which still exist. In this second stage of the program, the affected farmers will not have the right to any type of government assistance. It will, therefore, be necessary to undertake an extensive publicity program directed at the farmers in the coca production areas, explaining the benefits of accepting the voluntary phase. This will also serve to demonstrate that the government fully intends to use coercive means to force eradication.

B. Credit Fund for Economic Reactivation (US\$150,000,000)

In the first part of this document the impact that drug trafficking has on the national economy was evaluated. It was indicated that this activity annually generates between 2.0 and 2.5 billion dollars; of this amount, between 200 and 300 million dollars remain in the economy. This means that the intense control and eradication campaign that will be undertaken by the Bolivian Government will bring about a considerable decrease in revenue funds for the national economy.

This implies, naturally, that economic activity will be substantially affected. In order to minimize the effects of this phenomenon, the government feels it is imperative to introduce funds into the economic reactivation, mainly in regions affected by drug trafficking.

To this end, an Economic Reactivation Fund of US\$150 million has been created. The objective of this Fund is to foster agricultural production and diversification, mainly in departments affected by drug trafficking. In the department of Cochabamba, greatest emphasis will be placed on the channeling of support to the area surrounding the Valle Alto, where land is well-suited for alternative crops. Additionally, the majority of the farmers who have emigrated to the Chapare are originally from this region.

Moreover, the beneficiaries of this support will not necessarily be limited to those farmers who cultivated coca, since the funds will be authorized to any agricultural producers who request them.

C. Regional Development Plan (US\$40,000,000)

Parallel to the actions described in the previous sections, the implementation of development projects will proceed in the areas directly or indirectly affected by drug trafficking.

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Given the limited achievements of the Chapare Project (which only provided resources for activities within the Chapare itself), it is planned to carry out integrated development programs in those regions from which many of the coca-producing farmers migrated. The object is to attract those farmers who emigrated to the Chapare to return to their original lands. The project will have as its principal components: agricultural research and extension, infrastructure, and agroindustry.

Elsewhere, a program for "Agricultural Diversification and Agroindustrial Development in the Yungas of La Paz" has been functioning since the beginning of the year, supported by the United Nations Fund for Drug Abuse Control (UNFDAC). Unfortunately, in the absence of sustained interdiction, this program also has had little or no impact on coca production or trafficking activities. This project seeks to diminish the economic dependence of the coca farmer in areas of traditional cultivation, and to avoid the expansion of coca crops to others. Its principal components are agricultural diversification, agroindustry and commercialization, the construction of community roads and social infrastructure works. Agreements are signed with selected communities which agree not to plant more coca.

Both the Chapare and the Yungas efforts are limited and do not meet all the requirements of the regions affected by drug trafficking if these regions are to be able to sustain a permanent and rational development effort. Specific activities must be carried out in these regions to permit a productive transformation, whose impact is more than temporary.

Among these tasks are the construction of irrigation systems, construction of infrastructure for transporting marketable products, improving basic infrastructure in determined strategic areas, and creating agricultural research centers to improve the yields and profitability of alternative crops.

It is estimated that the cost of this program will be approximately forty million dollars, and will require continued external concessional financing.

D. Prevention and Social Rehabilitation Campaigns (US\$10,000,000)

A final component of the anti-narcotics program developed by the Government of Bolivia refers to the need to rehabilitate drug addicts and prevent the unlawful use of narcotics. This program acquires greater importance since as interdiction intensifies, an increase in consumption is predicted, as the majority of narcotics will be dumped on the local market at lower prices as opposed to being exported.

This program is comprised of intensive campaigns designed to educate people on the effects of drug use and the damage it does to our society; it also includes the establishment of rehabilitation centers for drug addicts and the creation of prison centers to isolate drug traffickers from other prisoners.

The prevention campaigns on drug use will be systematically developed with the collaboration of various international, multilateral and specialized private organizations.

The rehabilitation centers will not only attempt to rehabilitate drug abuse victims, both socially and medically, but will also provide them with job training.

Finally, it is important to emphasize the construction of separate prisons for narcotics traffickers, as it has been established that those in prison for minor crimes often become actively involved in drug use or trafficking after having contact with drug traffickers in prison. In addition, existing prisons do not meet even minimum security conditions, allowing drug traffickers to escape prison. Similarly, infrastructure for the administration of justice should be improved, since this system is currently incapable of handling the enormous volume of work related to drug trafficking. Delay is one of the characteristics of the Bolivian judicial system: this fosters corruption and immorality in the administration of justice.

It is estimated that the Prevention and Rehabilitation of Drug Addicts Program will require ten million dollars, which will be used over three years.

E. Required Budget for the Implementation of the Plan

As has been explained throughout this document, the Three Year Anti-Narcotics Program is comprised of two basic components. The first, interdiction, is at present being carried out with the collaboration of the United States Government, but clearly requires additional international financing. The second, the Plan for Agricultural Conversion, Economic Reactivation and Regional Development, hopefully will be financed by the Consultative Group for Support to Bolivia.

The second component in the Plan will require US\$300 million, to be used over three years, in accordance with the budget which appears below.

The Government of Bolivia, within the limitations which are implied by the economic crisis it is confronting, is prepared to spend up to 20% of the funds required from its own resources to execute this program.

Chart

PLAN FOR AGRICULTURAL CONVERSION, ECONOMIC REACTIVATION AND REGIONAL DEVELOPMENT

COMPONENTS-----Objectives

- I. FAMILY REHABILITATION FUND - Provide coca producers with the economic means to eradicate their entire coca cultivation and to convert their economic activity to the production of other legal agricultural products.

II. CREDIT FUND FOR ECONOMIC REACTIVATION - Provide producers in regions affected by drug trafficking with the credit resources necessary for an economic reactivation process.

III. REGIONAL DEVELOPMENT PLAN - Construct basic infrastructure to make production and marketing of alternative crops viable.

IV. PROGRAM FOR PREVENTION AND SOCIAL REHABILITATION - Carry out campaigns for preventing drug use, create social rehabilitation centers for drug addicts, and improve the prison and justice administration infrastructure.

ESTIMATED COST (millions US\$)	CHRONOLOGY OF PAYMENTS			FINANCING
	1987	1988	1989	
I. 100	70	30	--	Donation
II. 150	40	50	60	Concess.Credit
III. 40	10	20	10	Concess.Credit
IV. 10	5	5	--	Donation
TOTAL 300	125	105	70	

#### V. CONCLUSIONS

Solving the drug trafficking problem is fundamental to Bolivia's survival as a nation and to the well being of the citizens of North America and Europe who are suffering the plague of cocaine. The magnitude of this problem in recent years is reflected by the alarming changes in the economy, the political system and society, and demand a direct and immediate solution. The relationship and the effect of drug trafficking within and on the international community determine the existence of a shared responsibility to fight against this evil.

The fight against drug trafficking in Bolivia has two inseparable components: First, interdiction -- the objective of which is to stop production and traffic of cocaine, and thus reduce the price and profitability of coca, and second, to help those who depend on coca production by providing the means and conditions necessary for them to change their source of income.

Interdiction has been carried out since July of this year in a bilateral manner with the help of the Government of the United States. This action, which implies a high political cost for the Government of Bolivia and economic cost to the United States, should be permanent and supported by the international community.

Those who are involved in the various aspects of drug trafficking must cease what they are doing and become a part of society. A mobilization of international resources is needed to generate alternative

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sources of income for the affected population. With this purpose in mind, the Government of Bolivia has presented to this forum four types of actions: Agricultural Conversion, the creation of an Economic Reactivation Fund, the Regional Development Plan, and the Plan for Prevention and Social Rehabilitation. To carry out these actions, 300 million dollars in financing is needed to be used over the next three years.

In the absence of international financing for this project, the Government of Bolivia will continue in its efforts, but, with inadequate funds, will face almost inevitable defeat. At no time in recent history, has Bolivia had such a clear prospect of a victory against narcotics and at a low cost relative to the international threat of narcotics activity. The cost is certainly manageable if funded by all the countries involved with this problem. Failure to provide support now will lead to a substantially higher cost in the near future.

The tasks mentioned cannot be postponed. The international community must use every means at its disposal to help eradicate this evil. Bolivia, too, will not abandon its responsibilities in this most important matter.

ANNEX E  
SUMMARY REPORT

Page 1 of 1

Meeting Held November 13-14, 1986 to Discuss the Future of USAID's  
Narcotics-Related Activities

Attendees: USAID staff; Key Project counterparts; GOB officials;  
Leader of the Chapare Evaluation Team; NAU staff.

- 1) The group agreed that focusing all development resources on the specific area covered by the Chapare would, in light of new coca control developments, be an error. Given the ecological limitations of the region, it could only be expected to offer an adequate economic livelihood to approximately 25,000 families if coca were totally eradicated. The region now has a population estimated at approximately 74,000 agricultural producer households and 30,000 to 80,000 temporary residents. Placing all development investment in the Chapare when coca was no longer viable might serve to retain people there who would be better off leaving the area so they would not be subsequently tempted to return to coca cultivation. Therefore, the group recommended (and USAID agreed), that the focus of the Project be expanded and that Project resources be utilized to accomplish the Project purpose in places of significant Chapare migratory origin. The specific locales identified were the Associated High Valleys of the Department of Cochabamba. USAID agreed, with the caveat that no development resources would be shifted to areas that had the potential for growing coca, e.g. along the new Chimore-Yapacani road, and that significant resources would remain invested in efforts in the Chapare sub-region.
- 2) The group agreed that the agricultural research and extension activities in the Chapare should continue without interruption. Such activities would seek to expand the production/availability of plant genetic materials to ensure a response capability to the potential increased demand that could be expected from farmers after a sustained interdiction and eradication program.
- 3) There was concurrence that nearly all infrastructure activities in the Chapare should continue to be suspended for the foreseeable future (i.e. until trafficking and coca production in the region largely ceased). The only infrastructure activity that would continue would be bridge and road repair work along the main road into the Chapare. Such works were considered by the Bolivian authorities, NAU, and DEA to be essential to the successful implementation of interdiction efforts and to permit cost-effective transport of legitimate crops.
- 4) The group concluded that continued pursuit of large-scale agroindustrial investments was impractical within the Chapare region, due to the risk and the long lead times necessary even under optimal conditions. Exceptions were the Hog Fattening and Tropical Fruits projects already underway. However, the group did feel that support for small-scale agribusiness within the region still could provide additional markets for agricultural goods as well as important employment opportunities.
- 5) Finally, it was agreed that not only the Chapare coca growers but the many day laborers who stomp coca leaves into paste were an important part of the target group. It was deemed crucial that a revised development strategy include incentives for this group to leave the Chapare. Such incentives would convince laborers that, once the day labor needs of narcotics trafficking ended, other jobs existed for them -- perhaps back in the communities from which they migrated and where many of their families still are.

ANNEX F:  
EXPANDED ANALYSES

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The three analyses contained in this section complement those done for the Project Paper prepared in May 1983, adding information specifically for the new Associated High Valleys activities. The Project area covers the Chapare (as before) and the Associated High Valleys of the Department of Cochabamba.

I. Technical Analysis

1. Agriculture and Forest Production Component

a. Natural Resource Management

(1) Reforestation

The demand for forest products in the high valleys area of the project region is increasing while the local resource base is being depleted. There is definitely a need for increasing the supply of forest products through reforestation projects with rapid growing, yet adapted, species such as pines and eucalyptus. The best results both in terms of survival of seedlings and productivity of trees occurs in those regions where the rainfall is above 600 mm (COTESU, 1986). The productivity is less where rainfall is lower. Areas of adequate rainfall in the project region are found at higher elevations and within the uppermost reaches of the many watersheds of the high valleys region.

Presently only COTESU-CORDECO operates effectively as an institution capable of executing reforestation projects. Within the project area, COTESU-CORDECO long-term plans include the establishment of pine and eucalyptus forests in the Vacas region. This area is included in the uppermost reaches of the Tucma-Uyuchama watershed which directly supplies water for the Mizque region. The reforestation of the Vacas region (540 hectares over three years) will also have a positive effect on soil erosion and on the regulation of the hydrologic cycle in the Uyuchama-Tucma watershed.

(2) Extensive Grazing Practices

The high valleys zone of the project area offers a complex environmental scenario. There has been little hard data collected on many of its components (i.e., the bio-geological and hydrological elements). Even less is known of the interdependencies between human activities and the natural resources and ecosystem processes. Yet it is easy to see that the immediate impact of the human population on the high valleys ecosystems results in the degradation of the affected ecosystems, the loss of biological diversity and the degradation of the life supporting systems (i.e. hydrological, nutrient cycles).

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The slopes and high-altitudes pastures within the project area are extensively used for grazing. Cattle, goats and sheep graze and browse on the natural vegetation of the entire region. Overgrazing has caused the loss of top soil, the degradation of forest lands, the reduction of ground cover density and a change in its composition.

Yet, traditional extensive grazing practices also have important social, economic and cultural implications. The significance of these elements is not clearly known as yet. Moreover, an understanding of the implications of these elements is fundamental to the development of appropriate mechanisms that will allow these practices to be transformed in ways that make them more productive and sustainable.

The research project being undertaken by COTESU-CORDECO intends to find relevant answers to the problem of overgrazing and to supply appropriate technological packages for improving the traditional systems. These technologies will in turn become critical inputs in the watershed management strategies to be implemented in the project region.

### (3) Watershed Management

Much of the development potential of the high valleys of the project region depends upon irrigation, which in turn depends upon the regular flow of water in the streams used for irrigation. Therefore, a key element of the project's development strategy is the proper management of the water catchment area above the area to be irrigated. Downstream investment in irrigation requires that a portion of that investment be devoted to the collection of pertinent data on the water being produced within the watershed, the sediment being transported by the streams, and the areas where management interventions would be most effective.

Presently we can only speculate that, due to the low percentage of ground cover of most watersheds in the region, the erodibility of their soils and the torrential character of the precipitation, the amount of sedimentation of downstream areas is significant, the amount of water passing through the system in the form of peak flow (and thus unavailable for irrigation), is significant and the potential for damage to farmland and human settlements due to flooding is substantial.

The research/extension component of the associated high valleys project area therefore, includes a series of pre-investment studies which will examine three selected watersheds in the region in detail (scale 1:20,000):

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- the Tucma-Uyuchama watershed (70,000 ha)
- the Tipa Tipa watershed (4,000 ha)
- the Calicanto watershed (5,000 ha)

These three watersheds feed already functioning irrigation systems in the project area and are expected to provide water for expanded irrigation systems in the future. The Tucma-Uyuchama watershed, will be studied for three additional reasons: (a) the impact of flooding on the town of Mizque and its irrigated lands, (b) the presence within the watershed of areas of potentially significant biological diversity and local endemism (*Puya raimondii*, *Podocarpus* sp., *Polylepis Icana*), and (c) the potential development of a small hydro-electric power plant on the Jiri-Tucma river.

The objectives of this high valleys component of the project are to:

- acquire basic knowledge of the elements and processes of the traditional resource utilization practices which have a negative impact upon the environment;
- develop intervention mechanisms (management practices) which reduce environmental degradation and restore the productivity of natural areas; and
- develop management systems which protect the remaining biological diversity and possibly reclaim degraded habitats and areas of local endemism.

#### (4) Institutional Support

One of the major obstacles in the planning and the proper execution of resource management plans in the high valleys region is the paucity of qualified technicians and capable executing agencies in the area. It is absolutely essential to strengthen the only specialized institution in the region, the Superior Technical Forestry School (ETSFOR) of Cochabamba, in its effort to train mid-level technicians. The institutional support provided to the school will specifically orient teaching and research efforts towards the management of the resources of highland region, the inter-andean valleys and high-altitude pastures; and will strengthen the training capacity of the school by supporting a new agro-forestry program, specifically the agro-forestry and sylvo-pastoral techniques critical for the training of mid-level technicians.

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(5) Forest Inventories and Industries

Despite the fact that the natural resource base of the region is to a large extent degraded, there are areas whose ecosystems could be better exploited in order to sustain their productivity and provide a wider range of products. Extensive areas of xerophytic forest in the Aiquile-Mizque region could thus become important and reliable sources of forest products in support of small artesanal activities, such as the manufacturing of "charangos" or furniture. These forest resources require proper inventories and management plans in order to fulfill their productive potential. The ESTFOR will carry out these inventories.

b. Agricultural Production and Credit

(1) Agricultural Production

The project seeks to demonstrate how an integrated rural development project in the associated high valleys can reduce rates of emigration through improvements in income and quality of life.

At the heart of this effort is a carefully balanced effort by the PADC to increase rainfed and irrigated agricultural production in the associated high valleys. It is particularly important that the beneficiaries of the various project activities represent as broad a cross section of the population as possible. The concentration of benefits among a single group, such as those having access to irrigable land, could exacerbate the migration problem due to an increase in income disparity within a community.

(a) Constraints

The most intractable constraint to agricultural production in the area is the lack of water. Rainfall is less than 500 mm per year and evapotranspiration exceeds precipitation during more than half of the year over much of the region. A limited number of streams maintain an adequate base flow for irrigation throughout the year. Contiguous areas of level land are limited, making the construction of reservoirs costly relative to the possible benefits. Despite the limitation imposed by water scarcity, it will be possible to achieve significant increases in production using known technology and acceptable levels of investment per hectare/person. A thorough analysis of surface and groundwater resources will be made and a master water plan designed to achieve optimum use of the available water resources. An improved master water plan system design will allow rehabilitation of salinated areas and more efficient use of water elsewhere. The use of very small gravity fed sprinkler irrigation systems will be explored by the PADC to further extend the area irrigated and the number of farmers benefited. Such systems are successfully being used in Guatemala and Venezuela under similar conditions.

Other constraints to agricultural production and possible measures to mitigate their impact include:

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Constraint

Counter Measure

Low crop yields in rainfed agriculture due to limited rainfall, diseases, soil infertility and poor management.

Soil and water conservation measures, organic matter incorporation to hold water and nutrients, application of Integrated Pest Management (IPM) practices, improved seed, and increased fertilization paid for by higher and more reliable yields.

Low levels of animal production, destruction of natural forests and range due to overgrazing, and erosion of non-agricultural land.

Use of part of the irrigated land's productive potential to produce forage, grain and crop residues to provide supplemental nutrition to fewer, more productive animals. Forage-producing trees will be planted on field borders and terraces to produce additional animal feed. Natural range areas will be managed through rotation and other measures with fewer, but better animals with resultant increased production and soil recuperation.

Low net prices for products due to market gluts, transport spoilage, and high transport costs.

A major effort to improve post harvest handling, food processing and industrialization in order to add value and reach different and less seasonal markets. Dry season irrigation will bring part of the produce on the market during the off-season. These measures will compensate in part for the contribution to market glut due to success in increasing crop production under the project. Investment in road improvements will greatly reduce the time and cost of reaching regional markets.

Labor scarcity, especially during dry off-season, due to migration to the Chapare and elsewhere with resultant limitations on the construction and maintenance of irrigation and soil conservation works and other labor intensive activities designed to improve production and quality of life.

Opportunities for work in the construction of irrigation works and roads to provide income incentives for some potential migrants to remain in the associated high valleys. The demonstration effect of improved production and income, increased work opportunities on irrigated land and employment generated in food processing should support a larger work force during enough of the year to permit people to remain in the region and devote more time to improving the productivity of the land.

(b) Advantages

The associated high valleys have an average elevation above sea level of 2,000 meters. A wide variety of both temperate and tropical crops can be grown. Evapotranspiration is relatively less than at lower elevations with the same rainfall. Pest and disease problems are relatively less severe than in the lowland humid tropics. Farmers in the region are capable of obtaining excellent yields of such crops as tomatoes and onions. Given adequate information and convincing on-farm demonstration, they will be capable of adopting new and more sophisticated practices.

(c) Strategies

At the core of the development methodology is a systems approach which views the farm management unit in the larger context of the watershed and ecological life zone within which it is a functional part. Examination of land capability and soils will provide guidance on land use options at the farm level. Each farm is considered as a system from an ecological, socio-cultural, technical and economic perspective. It is recognized that each farm family is engaged in a variety of enterprises at any one time or over the course of a year. These include extensive and backyard husbandry of several different animals, cultivation of a number of short and long cycle crops, both rainfed and irrigated, the gathering of plant and animal products for food, fuel and raw materials, home industry, and off-farm wage labor, predominantly found through migration to the Chapare and other areas.

Each farm system is treated as a basic operating unit. Applied research, experimentation and demonstration will all be carried out at the farm scale and will address the subsistence, risk minimization and commercialization goals of the farmer.

The project activities will be demand driven, depending to a large extent on needs expressed by farmers and farmer groups. A number of PVOs and agencies have been working for extended periods on problems in agriculture and related fields in the associated high valleys. Rather than embark on new ventures, the project will focus on problems and opportunities being addressed by farmers and PVOs, offering technical and financial support through the PADC. Emphasis will be given to the identification and training of able and dedicated para-technicians drawn from the farm population who will work with their peers.

(2) Credit

A major goal of the project is to make credit available to beneficiaries in order to promote improved production systems and investment in agro-processing activities. The difficulty has been to find a mechanism whereby credit can be disbursed to producers in a timely fashion and without excessive cost. Figures gathered by the PADC indicate that, under present conditions, a farmer from the southern district of the high valleys region of Cochabamba who borrows \$1,000 from a private financial institution is likely to pay more in completing the application process than in interest and service charges. This results primarily from the multiple trips to Cochabamba that are necessary to complete the application and approval process.

This situation illustrates the need to have a source of credit located in the southern district. Presently, the only financial institution with branches in Campero and Mizque Provinces is the Banco Agrícola de Bolivia (BAB), a state institution which has suffered from numerous and widely reported management financial problems. However, there is a strong political willingness at the GOB level to rehabilitate the BAB following sound credit and management policies. On July 10, 1987 the GOB issued Supreme Decree 21660 which authorizes the restructuring of the BAB, pointing out a series of key measures, previously studied and recommended by AID credit consultants, to be accomplished in the next six months. It is foreseen that the implementation of these policies, with the close follow-up by AID staff, will let BAB become a strong and well managed credit institution.

While the BAB has offices in the southern district, it has not had sufficient funds to satisfy the demand for credit. According to the BAB, for example, of the approximately 500 eligible clients in Aiquile, the bank was able to service only about 250. As a result, a large portion of the producers of the southern district are forced to choose between undertaking the process of seeking credit through a private institution in Cochabamba, or resorting to locally available informal credit arrangements. Informal arrangements are often between a farmer and a member of the relatively small group of transporters.

In order to address this need, the modified CRDP design proposes to create a credit fund drawing upon PL 480 fund reflows from the Agricultural Emergency Credit component of the Disaster Recovery Project. Totaling \$5.5 million over three years, the fund will include \$3 million in agricultural production credit and \$1.5 million to support rural industry. The funds will be channelled into the provincial offices of the BAB under terms specified in an agreement to be negotiated between the PADC and the BAB.

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There are two general alternatives regarding the form the agreement may take. One involves limiting the role of the BAB to being the disbursor of funds, with the promotion, planning, follow-up, and legal responsibility for recovering loaned monies residing with the PADC. The other would leave the BAB responsible for all of these activities, with the agreement specifying a mechanism for coordinating loans made by the BAB with PADC development activities. Each alternative implies certain advantages and disadvantages for the PADC regarding the ways credit can be used to support development projects. However, the first alternative offers the decisive advantage of permitting the credit offered to farmers to be tailored more specifically to the technical packages and extension services being offered under the project. Given the recent improvement in BAB operations discussed above, this is the Mission's preferred strategy.

This coordination is important for several reasons. First, the project is attempting to improve economic conditions for members of the high valleys population who migrate to the Chapare. The same conditions of inadequate access to land and water which obligate many people to migrate also make them ineligible for conventional credit. Therefore, much of the work in support of agricultural production will be to improve the viability of some of these agricultural units. This will necessarily involve experimenting with different approaches to providing credit to people who do not normally receive it. It will also be necessary to conduct socio-economic analyses of the debt burden that poor rural families, not normally eligible for bank credits, are able to carry.

The PADC will work with those agencies of the BAB working in the project area (i.e. associated high valleys and the Chapare) to establish a program for distribution, supervision, and recovery of the agricultural production credit to be administered through the project. The structure and administrative operation system of the BAB agencies working in the project should be set up according with the requirements established by the PADC. Besides establishing general and specific procedures for credit management, the PADC will arrange any technical assistance necessary to strengthen the capacity of the BAB to implement this project component. In particular, technical assistance and/or training will include credit management and agricultural credit evaluation. The PADC will also analyze and, to the extent judged necessary, provide funding for logistical support to BAB agencies in order for them to best manage project credit.

## 2. Rural Industry and Marketing Component

The people living in the high valleys are at an economic disadvantage vis a vis other communities. Among the constraints are:

- difficult access to regional urban markets due to poor road infrastructure;
- agriculture limited by low rainfall and stream flow;

- lack of basic infrastructure such as electrical energy, potable water, and housing, and
- lack of services such as health care, education, agricultural and industrial extension and training, and financial institutions.

The result of these constraints is a low level of human well-being and economic productivity with a concomitant propensity of the working population to temporarily or permanently migrate in search of work. Rural industry development is seen as a significant contribution to improving the economic base of the region and thereby increasing the attractiveness of the region to would be migrants.

The objectives of the rural industry component are to:

- add value to locally produced or available agricultural, forest and mineral products;
- create additional employment spread over a longer period of the year;
- create products that can be stored and thus are less vulnerable to seasonal market gluts affecting fresh produce; and
- create products for local consumption by a population with increased income.

Rural industrialization is an integral component of an integrated development program in the high valleys. As such, it is reciprocally dependent upon, and a contributor to, other activities planned for the region. The probability of success of rural industries is enhanced by having good roads, energy, credit access, and healthy people with a basic education. Industry depends on a reliable supply of uniform quality raw materials such as agricultural products, wood, wool, clay, etc. In turn, production of quality raw material is stimulated by a proven potential for adding value through processing and industrialization.

Credit has been budgeted for viable rural industry projects and alternative avenues for bringing credit to individual, corporate, and cooperative entrepreneurs will be determined during implementation.

Identification of priority projects is an iterative process involving, on one hand, determination of where improvements in agricultural and forest management are possible and, on the other, of the competitiveness of potential processed or industrialized products in the regional or international market place.

The rural industry strategy is to:

- First, find those processed products which are currently produced and could be improved and their production expanded through improved technology and effective marketing;

- second, find crops produced for the fresh produce market or for subsistence that could be processed with resultant added value; and
- third, identify new crops that could be planted in the region and provide raw material for industrialization.

Examples of the first case are limited. Chicha is produced from locally-grown corn as a cottage industry. Major improvements could be made in the uniformity of product quality, its bottling and its presentation on the regional market. A better market could in turn stimulate production. Peanuts are roasted as a rudimentary industry. Avoidance of aflatoxin problems through improved post harvest handling and processing can improve the marketability of this product. The production of charangos (musical instrument) has been a small but locally significant industry. Assuring the wood supply through improved forest management and wider marketing could have a modest benefit to local producers.

Some pottery is produced in the high valleys, mostly around Tarata. Given the presence of appropriate clays and a supply of fuelwood or crude oil, a highly versatile range of products can be produced. These include tiles, bricks and pipe, decorative and utilitarian pottery, art works, and a wide variety of specialty products such as junction boxes, crucibles and other high refractory items. There are examples of small, profitable potteries where the requisite raw material and energy resources are available.

The potential benefits from processing crops now grown in the area will be a high priority in pre-investment studies planned. The manufacture of tomato concentrate and dried onion are to be considered. Both crops are produced in abundance and have serious problems on the fresh produce market. Various fruits including chirimoya are grown and could be processed. The figure below illustrates the value added potential inherent in some of the crops currently cultivated in the high valleys.

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EXAMPLES OF PRICES, POTENTIAL YIELDS AND PROCESSING FOR SELECTED  
VEGETABLE, HERB AND PEANUT PRODUCTS

A.

<u>Product</u>	<u>Production Has</u>	<u>Farm Gate Price</u>	<u>Industrial Processing Classification, Bagging</u>	<u>Gross Sell. Price</u>	<u>Gross Aggregated Value</u>
Anis (1)	10 qq	Bs 200/qq	Selected and bagged		Bs 500/qq
Onion (2)	100 qq	Bs 4/qq	Bunches	Bs 46/qq	Bs 42/qq
Cumin & oregano	10 qq	Bs 200/qq	Selected and bagged	Bs 700/qq	Bs 850/qq
Onion & garlic	100 qq	Bs 4/qq	Chopped and dried	Bs 320/qq	Bs 316/qq
Tomato	10 Tn	Bs 2.3/qq	Liquified & containarized	Bs 40/qq	Bs 37.7/qq
Peanut	62.5 qq	Bs 80/qq	Roasted	Bs 200/qq	Bs 120/qq

B.

	<u>Present Production</u>	<u>Improved Production</u>	<u>Present Income(3)</u>	<u>Earning due to Improved Production</u>	<u>Earning, Present Prod. Processed</u>	<u>Earning, Improved Production Processed</u>	<u>Difference in Income for Process.</u>
Anis, cumin & oregano	10 qq	20 qq	2,000	4,000	8,500	17,500	8,500
Onion & garlic	100 qq	250 qq	400	1,000	32,000	80,000	48,000
Tomato	10 Tn	25 Tn	506	1,265	8,800	22,000	13,200
Peanut	62.5 qq	80 qq	5,000	6,400	12,500	15,625	3,125

- (1) The aggregate value comes from processing primarily .  
 (2) The aggregate value comes from transportation an intermediate commercialization.  
 (3) All earning values are express as gross earnings (Bs).

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## CHART I

## POTENTIAL PARTICIPATING INSTITUTIONS IN CHAPARE PROJECT COMPONENTS

<u>Project Component</u>	<u>Activities</u>	<u>Location</u>	<u>Participating Institutions</u>	<u>Completion Date</u>
<u>Agriculture and Forest Production</u>	a) Watershed Management: - Immediate activities - Pre-investment studies - Technical assistance and training - Medium-term activities  b) Agricultural Production and credit - Immediate activities - Pre-investment studies - Technical assistance and training - Research and extension - Medium-term activities	<u>Chapare Associated High Valleys</u>	- IBTA/Chapare - Improved Potato Seed Service (SEPA) - Pairumani Crop Technology Institute - TARATA Agricultural Technical Institute (ITAC). - CORDECO/COTESU - ETF - CENDA - CEDEAGRO - CIDRE  - DAB - FENACRE	FY 88-89
<u>Rural Industry and Marketing</u>	a) Rural industry b) Marketing studies c) Credit	<u>Chapare Associated High Valleys</u>	- Food Technology Center (U.S. Simón) - CIDRE - CARITAS - FEDAPE - PROAGRO - ICI <sub>6</sub> - CORDECO/UCF	FY 88-89
<u>Productive, Transport, and Community Infrastructure</u>	a) Irrigation - Immediate activities - Pre-investment studies - TA requirements and training - Medium-term activities b) Rural Roads c) Community Infrastructure d) Electrification	<u>Chapare Associated High Valleys</u>	- SNC - CORDECO - CLIMAT/CDC - VISION MUNDIAL - CEDEAGRO - CIDRE - RADIO ESPERANZA	FY 88-89
<u>Investment Fund</u>	- Irrigation - Production - Community Sanitation - Communications - Medium-term Activities	<u>Chapare Associated High Valleys</u>	- PAIRUMANI - CEDEAGRO - CENDA - CIDRE - RADIO ESPERANZA - MIN. HEALTH - CARITAS - FEDAPE - VISION MUNDIAL ETC.	

3. Production, Transport, and Community Infrastructure Component

a. Irrigated Agriculture, On-Farm Water Management and Potable Water

(1) Irrigated Agriculture

Traditionally, irrigation water is put to productive use in the entire highland region of Cochabamba Department, as well as in other highland departments of Bolivia. Migration, agricultural activities, animal husbandry, and the health of the local population are all related to the availability of water. Many farm households in the project area are headed by women for part or all of the year, so both men and women are responsible for the distribution of irrigation water.

Irrigation water serves different purposes, such as:

(a) Purposes

- Replacement of absent rainfall during spells of drought during the rainy season. For this purpose water of all four sources (surface runoff, base flow, pumped groundwater, stored dam water) can be used.
- Reinforcement of deficient rainfall during the entire rainy season in the drier valleys. Also for this purpose water of all four sources can be used.
- Provision of preplowing irrigation (between June and September) for normally rainfed crops. For this purpose base flow, pumped water and dam water are used.
- Provision of dry season irrigation for dry season and perennial crops. For this purpose base flow, pumped water and dam water are used.

(b) Effect of Floods

Extreme floods may have 3 effects on irrigation systems:

- Water intakes may be washed out, destroyed, filled up with gravel or silt or otherwise put out of operation, requiring their repair or replacement.
- Channels may be filled for considerable depths and distances with sediments, thus reducing their capacity and obligating a clean up operation.
- Cultivated fields lying close to river courses may be washed out all together. In some cases rivers may range widely and relocate themselves entirely or carry mudflows that cover up large tracks of land.

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Large floods teach modesty to the designer. He has to learn when to stay away from a permanent structure in a river or to design it in such a way that the river has little grab on it.

(c) Potential Areas for Improvement or Construction of Irrigation Systems

CORDECO has run a study to divide the department in different rural development districts, sub- or micro- regions. Seven districts have been identified: Valle Bajo, Valle Central, Valle Alto, Sureste, Sur, Noroeste, Norte.

Due to the scarcity of irrigation water in the southern part of the department, irrigation development as a rule will be concentrated on the flatter soils where erosion caused by irrigation will be of little importance. If for some particular reason irrigation will be developed on sloping land, a strong program of soil conservation has to be carried through so as to avoid washing away of the usually non-cohesive or slightly cohesive soils.

Ing. Carlos Montaña Gonzalez (Plan Maestro de Recursos Hídricos con Fines de Riego, Cochabamba 1986) of CORDECO has provided the following data on irrigable land in the project area:

<u>Irrigation District</u>	<u>Actually Irrigated (hectares)</u>	<u>Under Construc- tion</u>	<u>Being Studied</u>	<u>Potentially Irrigable</u>
Valle Alto	6,520	3,290	24,200	45,000
Valle Central	8,370	300	20,600	27,000
Valle Bajo	550	450	150	1,500
Pocona	1,000	470	2,000	3,500
Mizque	1,100	620	550	6,500
Independent systems	<u>1,060</u>	<u>500</u>	<u>300</u>	<u>3,600</u>
Totals	18,600	5,630	47,800	87,100

For the subprojects to be developed under the program it is estimated that improved irrigation systems will cost \$700/hectare. For newly irrigated land the cost is estimated at \$1,500/hectare.

Full scale construction of the potential systems of irrigated agriculture could provide permanent work and income for some 25,000 families. Full scale construction will also increase production and create an unprecedented burden on the Cochabamba regional market. Also, unemployed mine workers from the Altiplano may possibly move to the area to take advantage of the jobs created, which would cause stress in the project area as they move in and compete with local labor. Therefore, social and production developments will have to be carefully monitored and guided.

(d) Objectives

The promotion of irrigated agriculture is advocated in this report with five basic objectives in mind;

- creation of new employment caused by the higher required labor input on a per hectare basis;
- increase of the remuneration on a per hour basis as a result of the higher net production levels to be obtained;
- contribution to a more equitable distribution of income and especially of the property rights of irrigation water and the irrigated land;
- reduction of the animal load on the upland grazing areas that suffer excessive erosion, perhaps by transferring them to irrigated areas; and
- avoidance of excessive salinization and alkalization of the irrigated areas.

(e) Constraints

The level of attainment of these objectives is constrained by different factors:

- scarcity of available water;
- reduced availability of adequate infrastructure to distribute irrigation water;
- deficient training of agriculturists to manage improved distribution infrastructure for the common good;
- deficient knowledge among agriculturists as regards "modern" agricultural inputs, especially pesticides, that are pushed indiscriminately by retailers;
- amongst the agriculturists generally a very low level of knowledge of potential (new) crops to be cultivated at the different altitude levels in the zone;
- a very low density of quality roads that facilitate the operation of a major number of (independent) truckers;
- suppressed prices of almost all local milk, staple and fruit produce due to current excessive importation (smuggling) and no opposition to artificially low or subsidized (dumping) prices of imported major basic foodstuffs;

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- a very low continuity of national objectives, goals, credit and importation policy, etc;
- a very weakly implemented system of public services, only partly supplanted by services provided by private institutions;
- a very weak judicial system to solve grievances and disputes and rule on land and water encroachment policies practices; and
- a lack of coordination of the policies and actions among the different segments of the population, officials and others, having to deal with the distribution of public or private investment and operational funds.

Irrigation is subject to a very complex set of local customs. One of the main complicating issues is the variation of available water flow and the variation of demand of water during the course of year. Another complicating issue is the different social origins of people living within an irrigation system. Some families are from old established communities, others are former feudal farmers, liberated after the land reform and others are recent immigrants. A third complicating factor, of recent date, is the application of deep-well water alternating with surface water. The cost structure of irrigation water from deep-wells is quite different from that of surface sources.

After the 1952, Land Reform, the Government (MACA/SNDC) became active during the 60's in the implementation of water control structures, mainly dams and dikes, to provide for more water during the dry season. For the rural volunteer construction workers a "Food for Work" program was adopted. Because of participation during the construction, rural workers obtained shares in the water provided by the structures. Cases are known in which contracting companies had to send their La Paz personnel back home, because of pressure by the future users of the systems who wanted to do the construction work themselves because of fear that they would otherwise lose their share of the water rights.

With land conditions as found in the project area, the enormous diversity of crops, the scarcity of water, the (usually poor) implementation with tools of each irrigator, it is suggested that the flow into the Third Block (i.e. final water distribution network) should be restricted to between 5 and 15 lit/sec. This may result in irrigated areas of 7 to 20 hectares each and gross Third Block sizes of 15 to 60 hectares, depending on the ratio of irrigated versus non-irrigated land that is being envisaged. In each Third Block, there would then be between 30 and 120 farming families. Irrigation time to be allotted to each family would then be 1 to 5 hours a week.

In case of smaller land sizes, allotted acreage under irrigation per family may be smaller and thus irrigation time per family be shorter.

In view of the scarcity of water and the potential profits that are associated with its use, it is probably justifiable to line the entire irrigation ditch in each case down to a webbing that has units of 4 irrigated hectares, that is down to 7 to 10 hectares gross. That means that each project would provide lined infrastructure with distribution boxes down to outlets, also for the smaller rotation channels. Within that unit, distribution will be through earth ditches and the up-to-20 families will be on their own to handle final distribution, though they may expect help through training and advice from project extensionists.

A serious problem related to the planning of each Third Block will be the relocation of plot boundaries. An irrigation lay-out inherently creates some minimum requirement regarding those boundaries, otherwise the system will become unreasonably complicated. Experimentation under Cochabamba conditions will indicate how much of this reorganization can be arranged by the farming families themselves without depending on outside help. It is understood that topographers are present to make a lay-out of the existing situation and will help with the establishment of the future alignments. Relocation of boundaries will be enormously time consuming, if at all possible.

#### (2) Potable Water

Piped domestic water in the rural and the small urban communities does not exist in the southern end of the department. In a few of the larger urban centers it exists in a rudimentary form. In several cases, clustered rural communities have gone to great lengths to obtain a proper supply of drinking water, often utilizing their own funds. This may be an indicator of the importance given to it.

#### (b) Electrification

##### (1) Improved Electrical Service in the Southern District

One of the purposes of supporting a regional development strategy in the southern district is to promote the rational concentration of agro-processing facilities and other services in an urban center, which would then constitute an alternative to Cochabamba as a population growth pole. One of the factors imposing an immediate limitation in this respect is the lack of a reliable source of electrical power. At the present time, both Mizque and Aiquile are serviced by diesel generators which operate only a few hours a day. This constitutes a serious obstacle to the concentration of agro-processing facilities or other services which would increase the demand for electricity in either town.

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Several alternatives for improving the provision of electrical services to the southern district were investigated. However, the options for short-term action proved to be limited due to the fact that responsible state agencies were not interested in pursuing electrification of the area because the low demand makes it difficult to justify the cost. Unfortunately, it is difficult to increase demand substantially until there is a more reliable supply.

One alternative considered was to support the extension of the national electrical network from Arani, where it currently ends, to Aiquile and Mizque. However, this proved impractical because the line which currently runs to Arani is already at its maximum carrying capacity. This means that the existing line cannot be extended. A new one with a greater carrying capacity would have to be installed from the power plant itself. In addition, the Empresa Nacional de Electrificación (ENDE) is not able to take responsibility for maintenance of the new line, even if the PADC were to pay for its construction.

A second alternative discussed was support for the construction of one or more small hydropower plants that would increase the electrical supply of the region. The Organization of American States has financed a series of profiles of possible hydropower sites in the southern district, and has tentatively concluded that the most economical alternative is the construction of a station at San Geronimo. However, all work in this area remains at the level of a general profile, and no specific feasibility studies have been conducted.

A third alternative considered has been the construction of a small electrical plant based upon thermal energy, which would take advantage of the gas pipeline passing approximately 20 kms. to the north of Aiquile as its energy source. CORDECO and ENDE have recently discussed collaborating on a feasibility study to investigate this idea. However, they have not yet agreed upon the terms of reference for the study, and interest in the project is not particularly high due to the problem of the currently low demand in the region.

In light of the need to improve electrical service in the southern district as part of a regional development strategy, the project will focus initial efforts on improving the existing electrical systems of Aiquile and Mizque. This would involve providing support for the maintenance and/or replacement of existing equipment in order to permit an increase in the hours of electrical service available each day. It would also involve institutional support to the local authorities responsible for the maintenance and operation of the electrical system in order to improve their capabilities in these areas. The PADC effort will also involve local promotion activities intended to encourage users to pay the true cost of the electricity they use based upon consumption measured through the installation of electric meters.

In addition, the PADC will sponsor a definitive feasibility study of the potential for developing hydropower in the southern district, and it will sponsor the feasibility study for thermal energy generation. Based upon the results of these studies, the PADC will develop a regional electrification plan which will consider not only the construction of improved electrical generation facilities but the administration and maintenance of regional electric service.

(c) Rural Roads

In late 1987 at the termination of the Rural Access Roads II (RR II) Project, activities currently supported by this project will be incorporated into the Chapare Regional Development Project (CRDP) assuring that the objectives of RR II will continue to be implemented. Major activities for 1988 include:

- the termination of possibly uncompleted roadwork between Angostura and Arani, and between Mizque and Aiquile;
- improvement of 107 kilometers of road between Arani and Mizque;
- construction of five bridges in the upper valleys of Cochabamba (at Mizque, Lampacillos, Aiquile, Cliza and Punata), and
- analysis of other possible road and bridgework needs, especially in the area of Aiquile. If extra time and money are available during 1988, work in this area may be undertaken.

II. Social Soundness Analysis

1. Migration from the Valleys of Cochabamba

1.1. Migration in Historical Perspective

The migration of large numbers of small farmers from the inter-mountain valleys of Cochabamba to the Chapare is the most recent manifestation of a subsistence pattern that has its roots deep in the co-evolution of agriculture and mining in the highland and valley regions of Bolivia. Since the re-emergence of the Bolivian mining industry in the second half of the 19th century, the small farmers of the Cochabamba valleys and other agricultural areas were the primary source of labor to the mining centers when international ore prices were high and production was expanding. When ore prices declined, this labor force, which maintained its ties with the communities from which it came, was re-absorbed into the small farmer population.

This pattern of migration continued in the wake of the 1952 agrarian reform, but with several important changes. First, with the demise of the hacienda system, an increased number of the agrarian reform, small farmers frequently went to work in the mines as a result of labor contracts negotiated with the hacendados. During periods of expanded mineral production, many hacendados found themselves facing the happy dilemma of balancing the revenues to be earned through labor contracts with the mines against the revenues to be earned through retaining their laborers to work on the land in response to the increased demand of the mining centers for food.

Second, the increased freedom for small farmers that accompanied the abolition of the hacienda system brought with it an increase in the subsistence costs of their households. Examples of these additional costs include the provision of schooling for offspring, which involved the construction of buildings and the purchase of uniforms and school supplies; contributions to establish and maintain sindicatos, cooperatives, and other institutions intended to protect and advance small farmers economic and social concerns; and the acquisition of agricultural implements and inputs that had previously been provided by the haciendas upon which they had worked.

Third, the approach taken by the agrarian reform of simply dividing the land among the families living on it created land units that were inadequate to support capital accumulation in agriculture. As subsistence costs increased and the population on the land grew, these land units quickly became insufficient to provide even the basic consumption requirements of small farmer families.

#### 1.2. Overview of Contemporary Migration

The result of these changes was to expand the scope and intensity of small farmer migration. The destinations of the migrants have been diverse, and have tended to change in response to changes in the demand for labor in different areas and at different times.

Within this context, several destinations have emerged as particularly important for people from the Valleys of Cochabamba. These include the city of Buenos Aires, Argentina where Bolivian men from the rural areas of Cochabamba, Potosí and Sucre are important sources of labor for the construction industry, and where Bolivian women frequently find work in factories or as domestics. Another important destination of Cochabamba migrants is Santa Cruz, where there is seasonal employment in the commercial agricultural enterprises of the region, particularly during the sugar cane and cotton harvests. Over time, many of the valley small farmers who have originally migrated to Santa Cruz in search of seasonal wage labor have remained as small holding settlers in the areas designated as colonization zones to the north and northeast of the cities of Santa Cruz and Montero. Most recently, the Chapare has become an important migratory destination as a result of the relatively high wages offered by the narcotics industry and the proximity of the Chapare to the Cochabamba valleys in comparison with other migratory destinations.

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While the current dominance of the Chapare as the migratory destination of choice is undeniable, it is important to remember that the other destinations continue to play an important role in the off-farm income generating strategies of valley households. Many people continue to choose one of the other migratory destinations instead of the Chapare. The reasons for doing this include perceptions of high risk, long-term instability in the employment situation and particularly exploitative working conditions in the Chapare. In addition, households which do select the Chapare maintain contact with relatives in the other migratory destinations as part of a general strategy to keep as many options as possible open in response to changing conditions in the labor market. This means that it is impossible to address migration to the Chapare separately from migration generally. While this implies that short-term impacts may be more diffuse than one would like, it also means that the modified project has the potential to address development issues that go well beyond the Chapare in their significance.

Relatively few people embark upon a migratory pattern with the idea that it will be a permanent part of their lives. Rather, the goal is usually to obtain the capital necessary to embark upon some sort of enterprise that will permit them to remain at home. In most cases, however, this hope proves to be illusory as a result of the limited employment options in the labor market in which they participate, and the limited investment opportunities in the home areas. Many long-term migrants to Buenos Aires who find relatively stable employment are unable to afford to leave it to return home. Similarly, the high labor requirements and low income of smallholder agriculture in Santa Cruz prohibit most settlers from returning home except for occasional visits. Seasonal migrants frequently are unable to accumulate savings because wage rates are held down as result of migrants covering part of their consumption requirements through subsistence production at home.

Finally, the same lack of opportunities that prompts migration in the first place limits the kinds of productive investments that can be made. As a result, much of these earnings end up being spent on consumption goods. The constraints in accumulating savings and finding investment opportunities have caused migratory patterns to be extended across generations, and, while one may observe different migratory strategies employed by individuals or families in different stages of their life cycles, the need to migrate has become permanent.

The development of migration as a permanent feature of rural life in Cochabamba has had important consequences for the region. Chief among these has been the creation of labor scarcity in the rural areas, as households are forced to balance the requirements of agricultural production against the need to earn income elsewhere. In areas of high seasonal migration, large numbers of people tend to leave immediately after the harvest, and community labor activity such as the maintenance of irrigation works and roads, and the undertaking of soil and water conservation measures are frequently neglected.

Because of labor scarcity, activities which do not make heavy labor demands are favored, in spite of the fact that people may be well aware that they are promoting the long-term deterioration of their own resource base. One example of a labor saving activity that causes such deterioration is the extensive grazing of cattle and goats, which causes heavy damage to hillside areas throughout Cochabamba valleys. Under this management system the livestock represent a form of "savings on the hoof" which can be maintained with virtually no labor investment. Thus, the home resource base, inadequate to start with, deteriorates more rapidly because of labor scarcity, and its continuing deterioration exacerbates migratory pressures.

The importance of migration as a family income generating strategy has also had important implications for the overall development of Bolivia. For example, in the Chapare, the proximity of a cheap and relatively tractable labor force was as crucial to the region's development into the pre-eminent center in Bolivia for coca production destined for transformation into cocaine as the factors of climate and soil. Outside of the Chapare region, however, "modern" and "developed" sectors of the Bolivian economy have also grown as a result of the availability of a migrant labor supply that covered part of its own subsistence costs through agricultural production. For example, the commercial viability of much of the large-scale agriculture in Santa Cruz depends upon the availability of seasonal wage labor.

## 2. Probable Responses to Reprogramming the CRDP

### 2.1 Factors Affecting Response in the Chapare

The development activities to be undertaken in the valleys of Cochabamba will not have any immediate impact on the scale or nature of coca production in the Chapare. The immediate response to these development activities will be a function of the success of combined interdiction and development activities conducted in the Chapare itself. To the degree that interdiction heightens the risk associated with coca production and reduces the price paid for leaves and with it the wage paid to workers, and to the degree that development activities orient production away from coca to less labor intensive production regimens, one can expect the Chapare to lose its pre-eminence as a migratory destination. However, migration can be expected to continue to other destinations, as the development problems which are responsible for migration cannot be solved over the short term.

In anticipating the response of the Chapare population to interdiction in the lowlands and improved economic opportunities in the valleys, it is important to remember that the population in the Chapare is not homogenous, but is divided along class lines in ways that closely parallel Bolivian society as a whole. These divisions have to do with access to land and to the facilities for extracting the cocaine alkaloid from the raw leaves. One can expect that the impact of combined interdiction and development activities on the Chapare population will vary according to the class positions that these divisions imply (see Carafa et al 1987:13-17).

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### 2.1.1. Impact on Migrant Labor

The immediate response of migrant workers to interdiction will be to withdraw from the Chapare and return to their home areas, as they have done in the past when repression against coca production has intensified. They can then be expected to remain at home for a short time, waiting for the repression to ease as it has in the past. If this happens, the migrant workers will return to the Chapare, and production will continue as before. If the repression is sustained, however, the same need to generate off-farm income that obliged them to migrate in the first place will continue to exist, and migration can be expected to continue, albeit to an alternative destination. The information networks that exist among the home areas and the most common migratory destinations are sophisticated, and constantly carry information on changing labor conditions in the different areas. To the degree that the pressure against coca production is maintained, the alternative coca production is permitted to resume as before, the migrant labor supply will be able to respond to the demand on relatively short notice.

### 2.1.2. Impact on Landowners

The response of landowners to interdiction efforts will be less immediate than that of migrant workers. Because of the investment they have made in labor and money to acquire land and bring it into production, they will be reluctant to abandon coca as a source of livelihood. In the face of intensive repression, they can be expected to leave the Chapare for a short time or to remain and maintain a low profile. If interdiction efforts are sustained, however, landowners will be likely to want to try to protect their investment. They may choose to do this in several ways. One might be to become more receptive to agricultural development activities attempting to promote alternative production systems to coca cultivation. Another might be to fight interdiction efforts, meeting force with force and greatly augmenting the level of violence in the zone. One can expect that they might receive some encouragement and support for the latter course from the interests that control the regional narcotics industry.

## 2.2 Probable Impacts in the Project Areas

Project activities will focus in four areas: the improvement of infrastructure, the introduction or expansion of irrigation, the promotion of sustainable increases in agricultural production, and the promotion of agroindustries to process and add value to agricultural production. The purpose of these activities is to increase on-farm incomes through increased production and improved marketing conditions, and to generate off-farm employment opportunities in the area itself. Such an expansion of economic opportunities should, over time, reduce the pressures on members of beneficiary populations to migrate.

Because the economic changes the project is attempting to promote can not happen immediately, most of the activities will not have extensive short-term impact upon rates of migration. People who currently feel obliged to migrate will continue to need to do so. The major exception that can be expected in this pattern will be among those families who are incorporated into irrigated production. Data collected by our team and in the sondeo conducted by Carafa et al. (1987), clearly indicate that families with irrigation are much less likely to migrate than are those without.

Among that portion of the population that does not benefit directly from irrigation the most immediate impact will probably be to reduce the rate at which new people join the migratory flow each year, rather than to cause individuals already migrating to cease. To the degree that project activities result in an expansion of economic opportunities, migrants will over time be likely to invest some of the revenues earned through migration in their home areas and attempt to earn a living at home.

That migration can be expected to continue in areas of project activity has important implications. First, many of the initial participants can be expected to be women, who manage lands in the valleys while their spouses migrate. Second, activities which require a substantial investment of family labor can be expected to fair poorly, as migration will create a condition of labor scarcity in most areas for significant parts of the year.

## 2.3 Special Considerations

### 2.3.1. Impact on Migratory Pressure

Because the goal of the reprogrammed CRDP is to reduce migratory pressure and not simply to promote economic growth in the agricultural sector, several special considerations need to be borne in mind. Principal among these is the need to emphasize equity in the distribution of benefits in order to avoid exacerbating the very conditions that create migratory pressure, as could occur as a result of activities that promote a decisive advantage of one group over another in the areas of production or marketing.

The most immediate potential exacerbating migratory pressure lies in the area of irrigation. The irrigated zone of Mizque, for example, has been cited as one of the areas of Cochabamba with greatest agricultural development possibilities. The area has in the past been a source of employment for small farmers confined to dryland farming in the surrounding area and parts of the Valle Alto. At the present, the irrigated agricultural land is concentrated in the valley floor in the hands of a relatively small number of producers. With the economic dynamization associated with successful improvement of marketing conditions and promotion of small agriindustry, the increased irrigated agriculture in Mizque could provide a demand for off-farm employment that would attract a portion of the region's population currently involved in migration.

However, even if the area under irrigation is extended to its maximum potential (approximately 4000 has.) and economic support activities prove successful, only a minority of the Mizque population will be affected directly. The majority of the population, which would not benefit from the expansion of irrigated agriculture, could actually see its own position in the regional economy worsen as result of support for irrigation, and the pressures upon it to migrate could intensify over the medium to long-term. For example, the farmers in the irrigated agriculture sector will accumulate capital, which they would likely invest in the acquisition and consolidation of dryland farm areas for the purpose of supporting associated farming activities, such as livestock herds. While part of the population would be absorbed as laborers on the land it formerly owned, a new landless population would be created which would be forced to migrate in order to survive.

Migratory pressures could also be inadvertently increased even in the absence of the acquisition and consolidation of landholdings by farmers with irrigation. An economic expansion by this group would imply an increase in subsistence costs generally throughout the area, as a result of increased demand for agricultural inputs and social services. Therefore, the portion of subsistence costs that families could not satisfy through their own production would increase, which would provide an additional incentive for migration in search of off-farm income.

In order to encourage the sustained economic growth needed to lower the rate of migration, it is necessary to promote capital accumulation on the basis of resources such as irrigation. At the same time, it is important to remember that such activities increase the significance of differential access to resources by providing people with the means to widen the gap between them and their neighbors. Therefore, if the project is to reduce rather than increase migratory pressures, it is essential that activities to stimulate accumulation that are based upon a particular resource be accompanied by activities to raise the incomes of those portions of the population that do not enjoy access to that resource.

### 2.3.2 Participation of Women

The project goal of reducing migration rates also increases the importance of involving women directly in agricultural production and income generation activities. While rural men and women alike attribute a secondary role to women in agricultural production, there is considerable evidence that women make a major contribution in this area, particularly with regard to vegetable crops and livestock raising (Carafa et al, 1987). In any case, women assume responsibility for management of the farm as well as for domestic activities when men migrate. Furthermore, most projects involving community work, such as the construction or improvement of irrigation ditches or tree planting, necessarily take place during the dry winter months when agricultural activity is at a low. This is also when male migration is at its highest level. Thus, if progress is to be made quickly in areas such as the installation of irrigation systems, the construction of such works as galerias filtrantes, and the teaching of soil and water management for agricultural systems under irrigation, it will be necessary to work directly with women.

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There are currently 148 women's clubs in the distrito sur, most of which have been organized by CARITAS, while a smaller number have been sponsored by FEDAPE. By working with these PVOs, the project will have an excellent basis for undertaking work with women. The primary problem lies in reorienting the approach that the PVOs have taken to women's issues. The activities undertaken have focused upon women's domestic labor rather than upon their role in agricultural production, with typical activities involving knitting, community vegetable gardens, or the making of household articles such as soap and candles. While some of these are ostensibly income-generating activities for women, their goal is clearly limited to providing women with "pocket money" to supplement what they receive from their husbands. For the present project to move ahead quickly, it is important for women to be trained in productive areas that are directly related to the family's primary sources of livelihood, such as agricultural production techniques, the management and maintenance of irrigation systems, and livestock management.

### 2.3.3 Labor Scarcity

The fact of migration also means that the activities undertaken by the project will frequently be operating in a situation of labor scarcity. During the periods when most family members are present, the chances are that they will be heavily involved in agriculture, while slack periods in the agricultural cycle will often be characterized by the absence of large numbers of people.

This has implications for achieving project objectives. First, as noted above, it will be important to establish the full participation of women. In addition, it means that it will be necessary for the project to judiciously use hired labor to complete many tasks and rely upon labor contributions from project beneficiaries. Finally, while hiring labor to carry out project activities will provide a short-term alternative to migration for some, and thus should be exploited, the work will have to be paid for with a real wage in order to be effective. Because of labor scarcity, "make-work" activities which rely upon labor contributions in return for food are likely to yield disappointing results, both in terms of the speedy completion of activities and in terms of providing an alternative to migration.

## III. Financial Plan

### 1. AID Grant (reprogrammed and new funds by Project component)

#### a. Agriculture and Forestry Production

A total of \$575,000 will be furnished from this amendment to fund the following activities:

i) Chapare Research and Extension. \$500,000 will be used under the amendment to support the Plant Material Production Program to be developed by IBTA/Chapare.

ii) BAB short-term Technical Assistance. \$75,000 to cover 5 person-months of U.S. advisory services.

b. Rural Industry and Marketing - Chapare

\$8,000 from reprogrammed funds is estimated to be required to complete the costs of technical assistance.

c. Productive, Transport, and Community Infrastructure - AHV

A total of \$4.9 million from new grant funds will be provided to fund Rural Road Improvement activities from this amendment for the SNC to finance the upgrading of 200 kilometers of roads and the construction of 8 bridges in the AHV.

d. Planning Studies

\$34,838 financed the cost of the multidisciplinary consulting team which assisted in the preparation of this Project Amendment.

e. Institution Building

i) Program for Alternative Development in Cochabamba (PADC)  
(ex-SDBT)

(a) Technical Assistance. \$2,430,000 (\$300,000 from reprogrammed funds and \$1,630,000 from additional monies) will finance the following: \$1,980,000 for four long-term technicians for approximately 144 months of work through an institutional arrangement, and \$450,000 for approximately 30 w/m of short-term technical assistance.

(b) Commodities. \$50,000 from this amendment will finance the purchase of three 4x4 utility type vehicles to be used exclusively by PADC LT technical assistance advisors.

ii) IBTA

(a) Technical Assistance. \$2,049,000 (\$797,000 from reprogrammed funds and \$1,252,000 from additional grant monies) will be available to fund the following: \$765,000 for 45 w/m of long-term technical assistance contracted through an institutional arrangement, \$1,224,000 for 72 person-months (3 persons for 2 years each) of LT institutional contractors, and \$60,000 for 6 w/m of ST/T.A. under PSC arrangements.

iii) SNC

(a) Technical Assistance. \$150,000 from new grant funds will be used to fund the contracts of two Bolivian professionals during a 24 month period.

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(b) Training. \$63,000 also from new grant funds will be disbursed to finance 12 in-country short-term seminars for SNC professional staff.

iv) MACA Sub-Secretariat for Alternative Development and Coca Crop Substitution (MACA/SSADCCS)

(a) Technical Assistance. \$100,000 from new grant monies will fund 20 person-months of ST/T.A. from third countries using the PSC arrangement.

v) Project Management

A total of \$800,000 (\$500,000 from reprogrammed funds and \$300,000 from new grant monies) will be provided as follows: (a) \$420,000 will finance the contract of a Project Coordinator for 4 years, and (b) \$380,000 will cover all direct costs of two local Project Assistants for a period of 4 years each.

f. Evaluations/Audits

\$140,000 from additional grant funds will be used to finance the execution of 2 outside evaluations and 2 independent audits of the Project.

g. Price/Quantity Contingencies

\$120,000 (5.3%) under reprogrammed funds and \$490,000 (approx. 5.1%) under new grant monies will be set aside to cover price/quantity variations on the above estimates.

2. AID Loan (only reprogrammed funds)

a. Agriculture and Forestry Production

i) Chapare Development Activities

(a) Research and Extension. A total of \$2,328,000 will be available to finance the following IBTA/Chapare's activities during the remaining life of the Project: (1) \$67,500 for covering the stipend cost of about 45 farmers at \$30/mo who are assisting IBTA in the implementation of demonstration farms; (2) \$292,000 for covering costs of inputs for IBTA's nurseries; (3) \$70,200 for covering the costs of 26 one-week workshops for Chapare farmers at about \$2,700/each; (4) \$29,000 for the communications program supporting extension activities at approx. \$7,000 per year; (5) \$350,000 for construction at IBTA's research facilities, of which about \$260,000 will be spent at La Jota and \$90,000 at a new substation; (6) \$149,600 for the payment of the costs of about 22 workers at approximately \$136/mo x 50 mos in the research stations; (7) \$1,319,681 for financing a plant material production program, which will provide Chapare farmers the necessary material for coca hectares eradicated; and (8) \$50,019 for miscellaneous expenditures of IBTA.

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ii) AHV Activities

(a) Natural Resources Management. \$380,000 will be spent as follows: (1) \$150,000 for a reforestation subproject to be implemented by an institutional agreement between the SDBT and the CORDECO-COTESU Project; (2) \$100,000 for financing a natural resources study to be conducted by CUMAT; (3) \$30,000 for funding a forest inventory pre-investment study; (4) \$50,000 for financing a watershed management pre-investment study; and (5) \$50,000 for financing the construction of flood control structures for the towns of Mizque and Omereque.

(b) Agricultural Production. \$505,000 will be available for the following funding: (1) \$240,000 for financing research and extension activities organizations such as: Improved Potato Seed Service, the Fairumani Crop Technology Institute, as well as the Food Technology Research Center of the "Universidad Mayor de San Simón", and the Tarata Agricultural Technical Institute; (2) \$50,000 for institutional support for the above organizations; (3) \$100,000 for the training of farmers and technical members of the above institutions; (4) \$40,000 for cropping systems pre-investment studies; and (5) \$75,000 for livestock management pre-investment studies.

b. Rural Industry and Marketing

i) Chapare Development Activities

\$640,000 will be used to finance the following activities: (1) \$360,00 for a swine agroindustrial subproject already approved by the USAID/Bolivia Mission; (2) \$230,000 already approved to finance a citrus subproject of the Del Valle company for funding two small agroindustries at Chapare; and (3) \$50,000 for covering the necessary costs for pre-investment studies by the PROAGRO institution in Chapare.

ii) AHV Activities

A total amount of \$150,00 will be used as follows: (1) \$75,000 for financing marketing studies of agricultural and agroindustrial commodities; and (2) \$75,000 will cover the costs of pre-investment studies for agricultural production processing to be carried out mainly by the PROAGRO organization.

c. Productive, Transport, and Community Infrastructure

i) Chapare Development Activities

\$41,000 will finance the completion of two electrification studies in the Chapare region with the companies NRECA and Commonwealth.

ii) ANHV Activities

\$649,000 will finance the following activities in the ANHV:  
(a) \$75,000 for funding five irrigation pre-investment studies; (b) \$200,000 will finance the procurement of equipment to carry out infrastructure works; (c) \$100,000 will cover the costs of in and out of country training; (d) \$100,000 for operational support of agencies implementing infrastructure works; (e) \$50,000 for financing the upgrading or replacement of two diesel electricity generators in Aiquile and Mizque, as well as for funding a feasibility study of hydro or thermal electricity power in these towns; (f) \$100,000 will be provided to finance the costs of rehabilitating irrigation systems that will cover up to 1,200 hectares; and (g) \$24,000 for setting up rural potable water sanitation systems.

d. Investment Fund

\$1,042,000 will be provided to fund small-scale subprojects in support for PVO initiatives.

e. Implementation Planning and Studies

\$25,000 will finance the logistical and salary costs of Bolivian consultants who are assisting in the preparation of this Project Amendment.

f. Institution Building

i) PADC

\$2,047,000 in loan reprogrammed funds will be provided to fund the following: (a) International Training. \$15,000 for short-term training of five professionals; (b) Personnel Costs. \$1,500,000 for covering the salaries, benefits, insurance, travel, per diem, training and other direct costs of 13 professionals; (c) Administrative Support. \$289,000 will fund the bonuses, travel, and per diem of 15 administrative officers; (d) Commodities and Vehicles. \$67,000 for the purchase of 3 vehicles, 4 x 4 utility type and for office equipment; (e) Operational Support. \$176,000 will cover the following costs; \$50,000 will cover the payment of rentals for the PADC's offices; \$45,000 for office expenses; \$31,000 for communications, publicity and public relation expenses; and (f) Miscellaneous Expenditures. \$50,000 to cover unforeseen SDBT small expenses.

ii) IBTA/Chapare. \$1,790,000 in reprogrammed funds will be available to finance the following costs:

(a) Training. \$92,500 includes \$55,000 for funding the costs of a long-term trainee in the U.S. or a T.C. during two years as well as for covering the costs of officers currently under overseas training, \$17,500 for short-term training of 7 people; and \$20,000 for in-country short-term training in IBTA's research stations.

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(b) Salaries and Stipends. \$800,000 will cover the payment of salaries, bonuses, and stipends for IBTA's staff.

(c) Commodities. \$278,000 will cover the purchase of the following: (1) \$170,000 for agricultural equipment and tools to support IBTA's new plant material production program, (2) \$25,000 for 1 microbus, (3) \$10,000 for dorm equipment, (4) \$50,000 for laboratory equipment and supplies, and (5) \$23,000 for audiovisual and office equipment.

(d) Operating Costs. \$570,000 will be used as follows: (1) \$175,000 for fuel, estimated at \$3,500/mo x 50 mos, (2) \$50,000 for office supplies, (3) \$85,000 for travel and per diem, and (4) \$210,000 for covering costs of vehicles, spare parts, maintenance and insurance.

(e) Miscellaneous expenses: \$49,500.

(f) MACA/SSADCCS. \$150,000 will be provided to procure office equipment/furniture and computers in support of the operations of this MACA Sub-secretariat.

g. Other Costs

Price/quantity Contingencies. \$300,000 representing approximately 3% of reprogrammed loan funds which will serve to cover expected variations in the cost estimates under the previous items.

3. PL-480 (reprogrammed and new funds)

a. Agriculture and Forestry Production

i) Chapare Development Activities

(a) Agricultural Production Credit. \$12,000,000 of credit in local currency funding will be disbursed by Banco de Cochabamba and Banco Industrial y Ganadero del Beni, and/or Banco Agrícola de Bolivia in the Chapare Region.

ii) AHV Activities

(a) Natural Resources Management. \$725,000 will be spent as follows: (1) \$295,000 for a reforestation subproject to be implemented by an institutional agreement between the SDBT and the CORDECO-COTESU project; (2) \$200,000 for financing a natural resources study to be conducted by CUMAT; (3) \$100,000 for financing a watershed management pre-investment study; (4) \$30,000 for financing two forestry nurseries to be managed by the SDBT; (5) \$100,000 for financing the construction of flood control structures for the towns of Mizque and Omereque.

(b) Agricultural Production. \$2,455,000 will be available for the following funding: (1) \$1,770,000 for financing research and extension activities organizations such as: Improved Potato Seed Service, the Pairumani Crop Research Center as well as the Food Technology Research Center of the "Universidad Mayor de San Simón", and the Tarata Agricultural Technical Institute; (2) \$70,000 for institutional support for the above organizations; (3) \$350,000 for the training of farmers and technical members of the above institutions; (4) \$190,000 for cropping systems pre-investment studies, and (5) \$75,000 for livestock management pre-investment studies.

(c) Agricultural Credit. \$5,500,000 of credit in local currency funds will be channeled by the BAB and/or other credit institutions in the AHV.

d. Rural Industry and Marketing

i) Chapare Development Activities

\$393,000 will be used to finance small agroindustries.

ii) AHV Activities

A total amount of \$1,900,000 will be used as follows: (a) \$200,000 for financing marketing studies of agricultural and agroindustrial commodities; (b) \$200,000 will cover the costs of pre-investment studies for agricultural production processing to be carried out mainly by the PROAGRO organization; and (c) \$1,500,000 for financing agroindustrial credit projects.

e. Productive, Transport, and Community Infrastructure

(i) AHV Activities

\$3,741,000 will finance the following activities in the High Valleys: (a) \$25,000 for funding five irrigation pre-investment studies; (b) \$190,000 will finance the procurement of equipment to carry out infrastructure works; (c) \$230,000 will cover the cost of in and out of country training; (d) \$100,000 for operational support of agencies implementing infrastructure works; (e) \$700,000 will finance the costs to implement two medium-scale irrigation systems; (f) \$50,000 for financing the upgrading or replacement of two diesel electricity generators in Aiquile and Mizque, as well as for funding a feasibility study for hydro or thermal electricity power in these towns; (g) \$500,000 will be provided to finance the costs of rehabilitating irrigation systems that will cover up to 1,200 hectares of irrigation rehabilitation; (h) \$246,000 for setting up 10 rural potable water sanitation systems; (i) \$1,700,000 for the SNC rural road improvement component to supplement funds to upgrade 200 kilometers of roads and the construction of 8 bridges in the High Valleys.

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d. Investment Fund

\$2,696,000 will be provided to fund small-scale projects in support for PVO initiatives.

e. Institution Building

i) MACA/SSDACCS. \$2,200,000 will be provided to finance: a) 20 professionals for 45 months each at \$2,000 (avg)/mo (\$1,800,000), and b) 15 support administrative officers for 45 months at \$326 (avg)/mo (approx. \$220,000). This latter financing will supplement the low salaries paid by the GOB Treasury in support of the MACA/SSDACCS.

ii) Price/Quantity Contingencies. \$860,000 representing approx. 3% of the new local currency which will serve as a cushion to expected changes in the above estimates.

4. GOB Treasury (reprogrammed and new funds)

a. Institution Building

i) PADC. A total of \$152,000 will be provided to cover support personnel costs.

ii) IBTA. \$570,000 will be furnished to fund salaries and other direct costs.

iii) SNC. \$1,600 will be used as counterpart monies to finance infrastructure subprojects.

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SELECTED PROJECT COMPONENTS: DETAILED ACTIVITIES

Activities under the Agriculture and Forest Production Component and the Productive, Transport and Community Infrastructure Component are described in detail in this annex. Detailed activities under the other two project components will grow from the components discussed here, and will be developed in detail at a later date.

1. AGRICULTURE AND FOREST PRODUCTION

a. Watershed Management

(1) Immediate Activities

(a) The Vacas Reforestation Project

The reforestation activities will take place within the upper reaches of the Tucma-Uyuchama watersheds, specifically the Vacas region. Through the production of timber, lumber, and fuelwood the project is expected to diversify the source of income of the participating peasants, while bringing into production marginal or otherwise unproductive lands. Soil conservation and water retention objectives will also be achieved. The cost of this component amounts to \$445,000 over three years and will be executed by the reforestation unit of COTESU/CORDECO, under the supervision of the PADC. At the end of the third year this project will have established 540 hectares of forest plantation involving pine (60%), eucalyptus (30%) and native trees (10%).

(b) Institutional Support to ETSFOR

This support aims at strengthening the capacity of the Technical Forestry School of Cochabamba (ETSFOR) to train mid-level technicians in watershed management, agro-forestry, range management, and highland forest management techniques. The support will specifically provide financing for short- and long-term specialized training abroad (Costa Rica, Brazil, Spain, and Chile) for students and faculty. It will also fund a two-year teaching assignment and a program in agro-forestry systems. This institutional support activity is expected to at least double the number of technicians graduating from the school, who would be hired by organizations engaged in the support of forestry activities such as the CORDECO/COTESU long-term forestry project. The focus of their training will be the management of highland resources, agro-forestry, and range improvement techniques, those resources most relevant to the project's work in the Associated High Valleys. The institutional support component will cost \$120,000 over three years and disbursements will be made upon presentation of specific proposals to the PADC.

(c) Establishment of Tree Nurseries

This activity will supply 50,000 seedlings per year for small tree plantations in the arid zone of Mizque and Aiquile. These seedlings will

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be used by farmers in these regions to provide construction timber, fuelwood, and fodder and to supplement their income. The establishment of these tree nurseries will cost approximately \$30,000. Emphasis will be placed on fast growing trees which supply a variety of products.

(2) Pre-investment Studies

(a) Land Use Capability and Watershed Management Plans

These studies will involve three major watersheds with direct implications for actual and future irrigation systems. The actual land use, potential land use and ground cover studies will cover approximately 80,000 hectares and will enable the development of specific watershed management plans. CUMAT will carry out the studies and also execute the initial steps of the implementation strategy. The cost of this series of pre-investment studies is \$300,000. The studies will be completed within the first year of the project and the management plans ready for implementation at the beginning of the second year.

(b) Biological Diversity Studies and Protected Area Management

A number of areas of biological diversity have been identified within the project region. Detailed inventories of flora and fauna are required for the development of appropriate management plans. These studies will be carried out by CDC under supervision of CUMAT through a PADC-CUMAT inter-institutional agreement. The studies will cost approximately \$40,000 and take six months. The studies will also produce specific environmental education packages as part of the management plans for protected areas.

(c) Inventory and Management Plans of Xerophytic Forest Resources

Extensive areas of xerophytic (dry) forest are found within the project region. Their sustained productivity of this valuable resource is being threatened by extensive grazing activities. This study should result in specific management plans for the dry-forest resources of the region. The incremental forest production due to the implementation of these plans would be used by local forest industries, (i.e. musical instruments and furniture) and serve as a source of fuelwood, fodder and fruits to the AHV dwellers. The cost of this study is approximately \$60,000 and will be carried out by CUMAT.

(d) Research/extension on Extensive Grazing Practices

The resource base of the region is threatened by extensive grazing practices involving goats and sheep as well as cattle. More intensive management systems need to be developed in order to conserve the grazing and forest resources of the region. This research/extension project aims at developing appropriate management packages by means of experiments involving the improvement of the forage sources, the rationalization of the grazing strategy and the improvement of animal breeds. This research will be carried out by the research unit of COTESU/CORDECO and will cost approximately \$150,000 over three years.

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(3) Technical Assistance and Training

The PADC requires the assistance of a forest/watershed management specialist who would coordinate the activities of this institution and supervise the projects being implemented by other institutions (CUMAT, CORDECO, CDC). This assistance should cover the duration of the project and involve a forest-watershed management specialist with experience in planning and coordinating activities in a wide range of subjects and within an interdisciplinary context.

b. Agricultural Production and Credit

(1) Agricultural Production

(a) Immediate Activities

(i) Improved Potato Seed Production

Potatoes are a major crop for both subsistence and cash sales. SEPA, the potato seed center, has existing programs in clean seed production and management practices which can be applied immediately to the needs of farmers. This organization will need \$17,000 to finance operational expenditures (e.g. purchase of fertilizers, contract of labor) for undertaking a program of production of certified potato seed, which will be sold to the farmers of the Rajay Pampa region. Loan budget is \$17,000.

(ii) Integrated Pest Management (IPM)

Experience in the project area indicates that when pesticides are used at all they are generally used improperly with resultant limited benefit in crop production and off site impacts. PROCIPLA, a private agency which has received previous USAID support under the Disaster Recovery Project has the capability of applying IPM technology in concert with other improvements in production practices. It is estimated that PROCIPLA will need \$30,000 to cover its increased administrative expenditures due to the programmed intensified campaign for the proper use of pesticides.

(iii) Vegetables and Fruits

Vegetables and fruits, because of their perishability, require careful timing of production, reliable farm-to-market transport and/or processing. Work in this area shows promise of immediate benefits and will be managed by the Pairumani Institute in coordination with the Food Research Center at the San Simon University. Loan budget is \$15,000.

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(iv) Grains, Legumes and Peanuts

Institutions such as CIFP have done much work on improving and adapting crop varieties to conditions found in the high valleys. With the initiation of the project, on-farm trials can begin in cooperation with farmer groups and PVOs active in the target area. Loan budget is \$15,000.

(v) Pasture and Forage Improvement

As improvements are made in rainfed and irrigated agricultural production, it will be possible to dedicate part of that irrigation water capacity to improvement of pastures, forages, and by-product utilization. Planning, inventory, and on-farm experiments can be initiated immediately. This effort will complement improvements in range management and reduction of destructive overgrazing being carried out under the natural resource management component. Loan budget is \$10,000.

(vi) Low Technology Implements

A constraint on the expansion of peanut production is the lack of appropriate harvesting implements. CIFEMA can immediately begin the design and testing of prototype peanut harvesting tools. Surveys can be made to determine if the lack of appropriate tools is affecting productivity or life quality elsewhere in the system. Loan budget is \$10,000.

(vii) Institutional Support

Various institutions, including Pairumani, SEPA and others, will develop inter-institutional agreements with the PADC in order to provide services on call to the AHV effort. Immediate funding is needed to focus their capabilities in support of on-farm experimentation and commercial trials. These institutions have little experience in working with farmer groups and PVOs. A total of \$125,000 in loan and counterpart funds have been budgeted for strengthening their outreach capacity.

(b) Pre-investment Studies

The farmers of the Associated High Valleys are at once involved in the production of a variety of crops for subsistence and sale, management of various animal species, and exploitation of forests for fuel wood and other uses. A list of studies relevant to their needs has been already identified and is included below. Appropriate organizations to carry out these studies include the Pairumani Institute, SEPA, Food Research Center, CIDRE, and others.

(i) Cropping Systems

Studies will be made of the combination of crops and production technologies that (a) meet the farmers needs, (b) are ecologically and technically feasible, and (c) satisfy subsistence needs or can be profitably marketed. Combined loan and counterpart funds budgeted are \$230,000.

(ii) Livestock Management

Any reduction in watershed degradation as well as any increase in the economic return from animal production will have to come from improvements in livestock management. Studies will address sustainable range management, animal improvement, and use of pasture and forages to improve nutrition. Combined funds budgeted are \$150,000.

(c) Technical Assistance and Training

A total of \$450,000 in loan and counterpart funds has been budgeted for these activities.

(i) Technical Assistance

To complement the capabilities of the PADC staff, the PVOs, the international advisors, and the national institutions involved in project implementation, individual consultants will be called upon on a regular basis to meet project needs. Areas of expertise will include soils, crop and animal production, processing and marketing.

(ii) Training

Short-term training focused on specific project needs will be an important project activity. Professional/technical personnel will receive out-of-country training in such high priority areas as soil conservation and water management, management of specific crops, and post harvest handling. In-country training will be a combination of technical and field activities. Topics include improved potato seed production (SEPA), land capability assessment (CUMAT), cross cultural communication, and soil and water management.

Farmer training constitutes a major element of the project. Field production training can be combined with practical exercises for technical personnel. Radio will be an important component of the PADC's communications program. Group meetings and field days employing a variety of visual aids and farmer para-technical trainers will be used extensively.

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(d) Research and Extension

The two activities will be closely integrated. Research will focus on specific needs expressed by farmers or observed by the team. Results will immediately become part of the extension and training programs directed toward farmers, farmer organizations and PVOs. On-farm experiments, trials and demonstrations will have an immediate extension function. Off-farm research will support the processing, industrialization and marketing components of the project. \$100,000 in loan and \$1,770,000 in counterpart funds are programmed for this activity.

(2) Agricultural Production Credit

The PADC will work with those agencies of the Banco Agrícola de Bolivia (BAB) working in the project area (i.e. Associated High Valleys and the Chapare) to establish a program for distribution, supervision, and recovery of the agricultural production credit to be administered through the CRDP. The structure and administrative operation system of the BAB agencies working in the project should be set up according with the requirements established by the PADC. Besides establishing the general and specific procedures for credit management, the PADC will arrange any technical assistance necessary to strengthen the capacity of the BAB to implement this project component. In particular, technical assistance and/or training will include the areas of credit management and agricultural credit evaluation. The PADC will also analyze and, to the extent judged necessary, provide funding for logistical support to BAB agencies in order for them to best manage project credit. In establishing the credit program consideration will be given to building operational and personnel costs in the interest rate spread. The BAB will provide experienced, high quality personnel who will be able to undertake actions for efficient and effective credit management. The BAB will also provide streamlined financial management with sufficient controls but with an agile and flexible system for credit delivery and accountability. The funds provided by the PADC to BAB for credit purposes are exclusively for the BAB agencies in the project area, and these agencies will give credits exclusively with money funded by the PADC. Credit eligibility criteria will be in line with those established by the PADC. Interest rates, terms, collateral rules, and commissions will coincide with those established for agricultural credit lines under the PL-480 Program and will be approved by the PADC and USAID. Limits for amount of credit and levels of credit which can be approved for activities under the project will be established with approval of the PADC. The BAB and PADC will maximize collaboration with agricultural producer associations for credit management along the general lines established by other PL-480 agricultural credit programs. Of a total \$17.5 million available for this activity, up to \$5.5 million will be programmed for agricultural production credit in the Associated High Valley regions and \$12 million for the Chapare. In the case of the latter, Project conditionality, discussed above, will require that Chapare credit applicants be certified by DRAPCO as not producing coca.

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### (3) Private Agricultural Organizations (PAO)

The Associated High Valleys and Chapare communities participating in voluntary eradication will be significant beneficiaries of the PAO project. This project will provide technical assistance, training, small grants and loans to existing cooperatives, agricultural associations, and rural farm unions in order to strengthen their capacity to serve farmers. The Cooperativa Integral de Servicios Cochabamba Ltda. located in Punata is one of the most successful PAOs. It will be one of the organizations assisted in its activities in the project area. This separate project has an overall budget of \$11,500,000, of which up to \$1,800,000 will be available for strengthening organizations in the associated high valleys and Chapare communities participating in voluntary eradication.

## 2. PRODUCTIVE, TRANSPORT, AND COMMUNITY INFRASTRUCTURE

### a. Irrigated Agriculture, On-Farm Water Management and Potable Water

#### (1) Immediate Activities

##### (a) Studies

Before the upcoming rainy season, a survey of dry season, low river discharge will be initiated. For this purpose about 20 water measuring flumes have to be installed to allow better selection and final dimensioning of the small scale projects. Simultaneously, an irrigation efficiency study at typical sites has to be carried out, also utilizing flumes. The program is expected to cost \$140,000, to be spent mainly during the latter part of 1987 and during 1988. A balance of funds will be left for continued observation and analysis.

In coordination with the natural resources management and environmental monitoring activities, special sites will be selected for installation of recording raingauges, flumes, water level recorders, flow splitters, and sedimentation tanks in order to get more information on rainfall, runoff, sediment discharge, and water quality relations. Also, several sections of watersheds of approximately 1,000 m<sup>2</sup> will be selected for installation of concrete retention bars and measuring equipment. Some of them also will be fenced to become exclosures, to measure the effect of elimination of grazing. Local communities near these plots that are willing to participate in their maintenance are essential in order to obtain realistic data. Individuals will be recruited locally. Implementation of the hydrologic and sedimentation studies will be carried out through the Hydraulic and Hydrologic Institute (HHI) in La Paz and hydrologists in Cochabamba. By the end of 1987, a 2 month consultancy of an experienced erosion/sedimentologist will be required.

The social study of Aiquile prepared by Yara Carafa, et al, will be increased to cover an expanded geographical area and the information gathered will be detailed more specifically in the areas of water (potable and irrigation), animal husbandry, and health and housing, with the aim of increasing knowledge of underlying relations and pinpointing investment opportunities in these sectors (e.g., water systems, irrigated vegetable yards for Women's and Parents' Clubs, and Chagas prevention designs for housing). Implementation of the social study may lead to specific activities in cooperation with CRS, CARITAS, and/or other groups.

(b) Upgrading of Water Systems

In coordination with PVOs and community groups in Mizque and Aiquile, and based on existing knowledge of social relations, hydrology, and soils, approximately 5 small projects will be selected for immediate improvement of water derivation structures and improvement and extension of water distribution infrastructure. Also, two similar irrigation systems in Tarata will be initiated in coordination with the local Irrigation Committee. These initial projects are expected to cost \$550,000, plus an important contribution, mainly in the form of labor, to be furnished by the involved communities.

All together the project may implement irrigated agriculture on 1,700 hectares that do not yet receive irrigation water and improve irrigation on some 1,500 hectares. Unit costs for newly irrigated land are estimated to be \$1,500/hectare and for improved irrigation systems \$700/hectare.

\$520,000 has been budgeted for planning and supporting activities. For training at the professional, technician and farmer level, the budget provides \$400,000. This training is crucial for successful operation of the irrigated agriculture systems to be developed.

(2) Preinvestment Studies

(a) Vacas - Arani

This study will be implemented once the initial activities of the program are in execution. This study would lead to a subproject for the irrigation of over 500 hectares of salinized land and would include analysis of the complicated irrigation and drainage problems associated with large-scale desalinization. It will be necessary to start with the easier subprojects first, in order to obtain field knowledge regarding the specialists available in Cochabamba.

(b) Tucma - in Mizque

This important river, the only one in the Mizque area with no present water deficit, will be studied regarding its hydrologic characteristics. This will be done in order to plan the construction of its derivation canal intended to increase irrigation in the Mizque plain, during the year 1988. The derivation canal in the Mizque plain will be approximately 10 km long, and its construction will end a large part of the irrigation water shortages. It also is possible that this study will indicate the feasibility of the construction of a 1 MW hydro-electric plant for Mizque.

Once an initial version of the Mizque master water plan has been formulated during early 1988, the geohydrologic survey for that area can be detailed and contracts will be let for consultancy and drilling. Financing of the exploration wells will be arranged in agreement with financing of production wells in case they result in water production. The preinvestment studies will cost a total of \$100,000. Final design for projects is included in the construction budget, which totals \$2,470,000 for the small projects (including wells and potable water), and \$1,500,000 for the two programmed medium-sized projects.

(3) Requirements for T.A. and Training

The long-term advisor in irrigation initially will be involved in organizing the irrigated agriculture section in PADC. In collaboration with her/his colleagues, the long-term advisor will make contacts with the PVOs in Cochabamba, Aiquile, and Mizque, to facilitate final selection of the small irrigation projects, and will finalize the organization of the two projects in Tarata. The advisor will also see that all required studies and field investigations are started and training courses for early 1988 are organized. The advisor will assist in establishing the procedure for review and approval of project and activity proposals as well as the research, training, construction and evaluation program to be implemented after the 87/88 rainy season. The entire training program during the initial three year project period has been budgeted for \$400,000.

By early 1988 (during the rainy season), a 4 week irrigated agriculture course at the professional level will be implemented. For this course, a 2 month consultancy of an experienced irrigation engineer is required. This person must be fluent in Spanish. Additionally, several two-week technician courses will be implemented.

b. Rural Roads

The improvement of rural roads is an important pre-requisite to creating better conditions for the marketing of agricultural products. In support of CRDP objectives, the Rural Access Roads II Project has already begun the improvement of two important sections of road in the associated high valleys, one running from Lago Angostura to Arani and the other from Aiquile to Mizque. Improvements on two additional sections, Arani-Rodeo and Rodeo-Mizque, are under study for future construction when remaining funds from the Rural Access Roads II Project are de-obligated and re-obligated for financing this CPDP component. The PADC will establish the most effective arrangements for implementation of this component (either through SNC Force Account or through private company contracts.)

c. Community Infrastructure

Based on the further findings of the social study, it is perceived that the construction of potable water systems is an essential element of a rural integrated development process that intends to upgrade the standard of living in the AHV. Therefore, potable water projects will be funded, which will be carried out by private construction companies to be contracted by the PADC.

d. Electrification

An increased supply of electricity is essential to achieving the project goal of stimulating agro-processing activities and rural industry in the Southern district. In order to improve the electrical supply, the project will support the repair or replacement and improved maintenance of the diesel generators which currently provide electrical energy to the towns of Aiquile and Mizque. The project will also support the carrying out of a definitive feasibility study exploring the possibility of using mini-hydropower plants or small thermal energy to generate electricity for the region. Should this study demonstrate that the above activities are feasible, the project will finance them and the PADC will contract private companies to carry them out.

INSTITUTIONS PRE-SELECTED TO PROVIDE TECHNICAL SUPPORT TO THE AMENDED PROJECT

1) Servicio Nacional de Caminos

The inter-institutional agreement between the PADC and SNC is already in force for the improvement of the roads between Lago Angostura and Arani, and between Mizque and Aiquile. In general, the SNC has effectively implemented Rural Roads II Project activities. With the transfer of the remaining funding of the Rural Roads II Project after its PACD on December 31, 1987, project activities will become an integral component of the CRDP under the management responsibility of the PADC. At the beginning of implementation of the Productive Transport and Community Infrastructure component of the CRDP on January 1, 1988, a decision will be made concerning implementation of contracts with private companies through the SNC fiscal account.

2) Centro Fitotécnico Pairumani

Pairumani is a private, non-profit agricultural research institute specializing in developing improved varieties of cereals adapted to the specific agronomic and socio-economic conditions found in different areas of Bolivia. It will provide the project with research and extension. The farming systems expert carrying out that portion of the implementation planning studies found it a highly competent and promising organization in cereals and associated crops.

3) Semilla de Papa (SEPA)

SEPA conducts research on improved varieties of seed potatoes. It offers training in the selection of seed potatoes and provides a credit program to facilitate the acquisition of improved seed by farmers. The farming systems expert carrying out that portion of the implementation planning studies found it a highly competent and promising organization. It will support the project in the improvement of potato production, particularly in upland areas without irrigation.

4) Capacidad de Uso Mayor de la Tierra (CUMAT)/Centro de Datos de Conservación (CDC)

CUMAT and CDC are private, non-profit research institutions which have already worked with the PADC in land use planning. CUMAT is a three year old institution extensively supported by USAID and the PL-480 Executive Secretariat. It has become a nationally and internationally respected organization, well-known for its work in natural resource management and land use planning. CDC is a more recently founded organization but one with significant international backing from Conservation International and the Nature Conservancy. CDC proved itself useful in the design of this PP amendment and will assist the PADC in designing and implementing river basin management strategies in areas where the project is supporting the expansion and improvement of irrigated agriculture. CDC will also cooperate with CUMAT in conducting biological diversity studies.

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5) Corporación Regional de Desarrollo del Cochabamba (CORDECO)/Cooperación Técnica Suiza (COTESU)

CORDECO/COTESU is a long-term forestry support project which will support the project with research activities and with trees for reforestation activities to be conducted as part of river basin management efforts. CORDECO/COTESU will also implement a reforestation plan it has designed for the Vacas area with support from the PADC. The CORDECO/COTESU project is the only example in Bolivia of an institution effectively implementing reforestation activities. The forestry expert carrying out that portion of the implementation planning studies found it to be a technically competent and effective organization.

6) Escuela Técnica Forestal (ETF)

The ETF is a forestry school established under the West German (GTZ) technical assistance Mission to Bolivia. Until now the school has focused its research and training efforts in the southern district and Associated High Valleys. Forest inventories will be conducted. Agro-forestry will be another area of strengthening. ETF has proven highly effective in its research and training to date and the expansion of its work indicated here is part of its own institutional plan.

7) Banco Agrícola de Bolivia (BAB)

BAB is the state agricultural bank and the only financial institution to maintain provincial offices in the towns of Aiquile and Mizque, in the southern district. The BAB will serve as the major channel for providing credit for agriculture and rural industry. The strengths and weaknesses of the BAB have been mentioned in previous sections. Technical assistance and training will be provided by the PADC to allow effective management of CRDP funds as described in Section III.2.b.(2).

8) Centro de Investigación y Desarrollo Regional (CIDRE)

CIDRE is a PVO which completed a series of descriptive monographs on several provinces of Cochabamba, including Esteban Arce (Tarata) and Mizque, and in which are compiled most available data on agricultural production and socioeconomic issues. CIDRE has also completed a study on household industry in Cochabamba that would be an important resource in promoting rural industrial development. CIDRE has also elaborated a regional development plan for the southern district which parallels that of the PADC in many respects. The primary difference is that the CIDRE plan calls for promoting the urban growth of Mizque as a secondary town rather than Aiquile, based upon the greater agricultural potential of the Mizque area. Because of the absence of CIDRE's director and deputy director during the re-design team's stay in Cochabamba, it was not possible to agree upon a specific working relationship between the PADC and CIDRE. However, both institutions have expressed an interest in developing such a relationship as quickly as possible.

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9) Other Potential Implementing Agencies

There are a number of potential implementing institutions operating in the southern district. Two of them, CARITAS and FEPADE (Fundación Económica para el Desarrollo), work primarily with women through Mother's Clubs. Between the two organizations, there are approximately 148 women's clubs functioning in the southern district at the present time. CARITAS is a social service agency of the Catholic Church, with its activities coordinated by FEPADE. CARITAS, which operates its women's clubs as part of its Maternal-Child Health program with PL 480, Title II foodstuffs, is planning to expand its activities in the area to include food-for-work projects. The clubs are an important entre into rural communities, particularly important in areas of high migration, where large numbers of men are absent for a substantial part of the year. Furthermore, the range of activities conducted with women through the clubs could be expanded to address issues such as irrigation and improved crop and livestock production methods.

Four institutions are working in the southern district in the area of agricultural development. These include: Vision Mundial, which is run by a confederation of protestant churches, and CENDA, CEDEAGRO, and CIDRE, all three of which are private, non-profit development agencies. Vision Mundial has specialized in activities such as the construction or improvement of irrigation ditches and access roads, providing materials such as cement to communities who contribute their own labor and tools.

CEDEAGRO (Centro de Desarrollo Agropecuario) and CIDRE (Centro de Información y Documentación para el Desarrollo Regional) have worked together in the district of Mizque in the construction of irrigation works and the support of agricultural development. CEDEAGRO has worked with communities in Mizque on the design of irrigation works and the support of agricultural development, by hiring contractors to carry out parts of the construction, and it has provided assistance in agricultural development activities based upon the installed systems. CIDRE collaborated with CEDEAGRO to conduct the socioeconomic studies upon which the irrigations systems were based.

CENDA (Centro de Comunicación y Desarrollo) also works in the area of rural development, but takes a different approach from CEDEAGRO and CIDRE. CENDA has concentrated its efforts in the upland, potato-producing area of Rakaypampa, in the province of Mizque. While it is concerned with problems of low agricultural production and environmental degradation, CENDA has prioritized health issues in its work with the community. Venereal disease afflicts about 40 per cent of all adults in Rakaypampa, and CENDA estimates that 90 per cent of the population is carrying chagas disease, which is endemic in the region. CENDA also publishes a newspaper with articles in Quechua and Spanish which serves the southern district. However, financial constraints have reduced the frequency of publication to approximately once every three months, which greatly limits its impact as a medium of communication and information. CENDA has agreed to work with the PADC and SEPA in a project to improve potato seed production in Rakaypampa, which will be funded out of the investment fund described above.

The most important medium of communication in the southern district is Radio Esperanza, which is a project of the prelature of Aiquile. The station transmits a number of educational and service programs dealing with issues such as the new taxation law, the administration of peasant organizations, health and pre-natal care, and agricultural development. It is also about to begin an educational program dealing with problems related to deforestation. Radio Esperanza is unique in that its programming is accompanied by an active field promotion effort. The station maintains a staff of five promoters who visit communities throughout the southern district and in the Chapare, providing follow-up to the radio programs. In Mizque, for example, this follow-up included assistance in the construction of galerias filtrantes to provide a community with irrigation, training in construction techniques, and training in securing funding and contracting technical personnel. The PADC has already entered into discussions with Radio Esperanza on how the radio station might support development activities in the southern district. The primary technical constraints on the effectiveness of Radio Esperanza for this purpose are the availability of electricity, which limits broadcast time to five hours a day, and an erratic signal resulting from problems with the station's antenna. Radio Esperanza is currently seeking funds (approximately US \$1,500.00) to correct its antenna problems and begin transmitting in short wave. The short wave broadcasts will permit the station to reach most of the Chapare. Dall (1987) has recommended that USAID/Bolivia provide the station with the funds to make the improvements. These could be provided through a grant from the investment fund to be created under the modified CRDP.

In Tarata, three institutions have been identified which are in a position to begin working immediately with the PADC. These include the Instituto Tecnológico Agropecuario Canada (ITAC), the Comité Impulsor Laka Laka, and CIDRE. ITAC was established with funds from the Government of Canada (CIDA) and provides post-secondary school training in agricultural sciences, awarding the titles of tecnico agronomo and bachiller. The school currently has 90 students, 63 men and 27 women.

Most of the students are from rural areas, and the institution attempts to find ways for them to return to their home areas to practice their professions. It is graduating its first class this year, and has an arrangement to place the students in their home communities.

While it offers a lot of promise, ITAC suffers from several limitations. First, it can accept only a portion of those qualified to attend because of a lack of dormitory space. At the present time, a large number of the male students live in a building that was constructed as a stable for sheep. Second, the school has a large amount of equipment that it has never used because it lacks the money to start the programs which would utilize the equipment. Also at the present time, the school lacks the funds to undertake the kinds of agricultural production activities that would provide practical training for students and generate revenues that would permit the school to be more financially self-sufficient. If encouraged to present a proposal to the PADC under the investment fund, ITAC could be strengthened as an institution, and it would be in a position to support the training of producers in both

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Tarata and the southern district. Priority areas of support would include the construction of an additional dormitory, the irrigation of the 23 hectares of land for improved pasture, and the development of a concrete outreach program that would support PADC efforts to develop the irrigated agriculture potential of Mizque and Tarata.

The Promotion Committee of Laka Laka was formed by a group of prominent citizens of Tarata in support of a project to build a dam on the Calicanto River. Ultimately, it was hoped that the dam project will provide irrigation for some 400 has. of land, potable water and hydroelectric power for the town of Tarata, and that the resulting reservoir could be the site of a fisheries project. Unfortunately, the plans for the dam project suffered from flaws in the design and management of the irrigation system and design of the dam itself. As a result, the CRDP re-design team proposed that an alternative approach be taken in which the river basin management and water distribution issues be addressed first as a pre-condition to correcting the dam design and proceeding with the construction. The problems with the Laka Laka proposal and the team's response are described in detail in the attached report dealing with irrigation and environmental issues. In spite of the difficulties presented by the original dam project, the Promotion Committee has shown itself willing to entertain alternative proposals regarding development activities in the area, and it has done a considerable amount of work in mobilizing the urban and rural populations in support of this and other development projects. Should the PADC wish to initiate activities in Tarata in addition to those slated for the southern district, the Promotion Committee could provide significant assistance in marshalling local support and cooperation.

CIDRE has worked closely with the Promotion Committee in Tarata in the promotion of development activities, including production of a monograph with a very complete summary of the socioeconomic data available on the province of Esteban Arze, in which Tarata is located. CIDRE engineers also designed the dam of Laka Laka discussed above. In spite of the design errors, the CIDRE engineers have solid technical backgrounds, and have indicated a willingness to work with the PADC or another institution in correcting the deficiencies. Should the PADC decide to proceed with efforts to design a flood irrigation system as a first step toward possible realization of the dam project, CIDRE would be an excellent institution to conduct the necessary socioeconomic studies related to land tenure, water distribution, and labor availability. CIDRE could also conduct the market studies needed to plan a rational production strategy to take advantage of the increased production potential offered by irrigation.

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PROJECT TECHNICAL ASSISTANCE PLANS

A. IBTA/Chapare Technical Assistance (continued from Phase I of Project)

IBTA/Chapare will continue to receive technical assistance to support its work under the CRDP. The present institutional contract, due to terminate on August 31, 1988 will be reviewed and the best mechanism to continue assistance to IBTA/Chapare will then be identified and implemented.

B. Associated High Valleys Technical Assistance (New)

1. Long Term Technical Assistance (Summary)

The general functions of the long-term technical advisors will be to: 1) assist the PADC in analyzing and addressing development problems in a multidisciplinary manner that reflects the interplay of the diverse factors underlying migration to the Chapare and elsewhere, and 2) help insure that this multidisciplinary approach is reflected in the PADC's task of coordinating the activities of other institutions. In order to accomplish these tasks, the technical advisors will work closely with one another as well as with their Bolivian counterparts. For example, the improvement and expansion of irrigation works will not have the desired impacts if these activities are not closely coordinated with the development of farming systems designed to take advantage of the improved production capacity. Neither irrigation works nor farming systems development will proceed well in the absence of improved understanding of land tenure and water distribution issues. Equally, increased production will bring few benefits to farmers unless substantial obstacles to marketing are addressed. In addition, the environmental problems associated with extensive livestock grazing must be addressed together with the problems of labor scarcity and the lack of alternative forms of savings to investment in animals that this production regimen implies. All long-term technical assistants should remember that the overall project goal of reducing migratory pressure is a social and economic one, and technical solutions to specific problems must be consistent with this overall goal.

a. Scope of Work for International Social Science Advisor

The international social science advisor will hold a Ph.D. in anthropology or sociology, and be experienced in conducting development-related research. Because the high rate of migration among the male populations of many of the communities makes the incorporation of women into development activities sponsored under the project essential, the ability to speak Quechua for working with monolingual Quechua speaking women is a highly desirable complement to fluency in Spanish.

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The social scientist will work primarily in support of the coordination and planning division of the PADC. Duties will be concentrated in three areas: 1) to conduct and supervise social science research; 2) to interpret socio-economic data and advise the director of the PADC on the formulation of a strategy for reducing migratory pressure through development activities; and 3) to develop a promotion plan to strengthen the capacity of peasant organizations to articulate development needs and to initiate activities on their own behalf that can be supported by the PADC.

The social scientist will investigate land tenure issues and water distribution in areas of project activity to determine how patterns of land ownership and distribution may affect the ability of beneficiaries to respond to the opportunities provided. The social scientist will also investigate the impact of migration upon labor availability, and indicate how this may constrain the ability of the project to promote productive activities requiring additional labor investments by beneficiaries. Based upon this information, s/he will work with irrigation and agricultural specialists to devise appropriate forms of production support.

The social scientist will also assist in the evaluation of the extensive livestock grazing regimens found in many dryland areas of the project. S/he will indicate the significance of this regimen in terms of factors such as the value of livestock to families as a means of storing savings and as a contribution to the diet, and the importance of livestock as a resource base for women. Based upon this information, s/he will work with the PADC to develop alternatives to extensive livestock grazing that are less environmentally destructive. This activity should be closely coordinated with activities to be carried out under the project in range and forest management, animal husbandry, and feed and pasture production.

The social scientist will conduct intensive, long-term migration studies in areas of project activity. These will have two major purposes. The first will be to link migratory patterns to social class divisions in order to anticipate differential responses to development activities promoted by the PADC. The second will be to establish a set of baseline data for monitoring the impact of project activities on migration rates.

The social scientist will also examine household resource use in areas of project activity in order to assess the level of indebtedness that families are able to sustain. S/he will work with the personnel of the financial unit of the PADC in interpreting this information in order to design mechanisms through which production credit services may be provided to as broad a portion of the rural population as possible. The sociologist will also work with the financial unit to explore alternative ways of organizing producers into associations capable of undertaking agroprocessing and commercialization activities.

Finally, the social scientist will examine non-farming economic activities in order to assess the possibilities for building upon these under the rural industry and marketing component of the modified project. Activities which offer possibilities for this sort of development include charango production in Aiquile, and pottery, fireworks, and chicha production in the Tarata area. This examination will involve an assessment of credit absorption capability, training needs, technical feasibility, local acceptance and labor requirements. In addition, it should be assessed whether support for a particular rural industry will contribute to the kind of equitable distribution of benefits necessary to have an impact in reducing migratory pressures. CIDRE has conducted an extensive study of family industry in Cochabamba, so close coordination with that institution in the analysis and interpretation of data would be highly desirable.

In addition to conducting research and assisting the PADC in interpreting the results, the sociologist will develop a strategy for increasing the capacity of peasant organizations to define needs and initiate activities on their own behalf. In particular, this effort will focus on developing the capacity of the women's clubs that have been established by CARITAS and FEPADE to undertake activities that will increase the incomes of participating families. In addition, the sociologist will work with the sindicatos to develop their capacity to define activities without relying upon the assistance of the PVOs working in project areas. Once this capacity has been developed, the assistance of the PVOs in areas specified by the sindicatos can be enlisted.

b. Long-term International Advisor in Farming Systems

The long-term international advisor in farming systems will hold a graduate degree in the agricultural sciences with a strong background in tropical agricultural production systems, preferably in the Andean Highlands. Fluency in Spanish is essential.

The advisor will work closely with the production unit of the PADC in its role of planning and coordinating the agricultural production, credit utilization, agroindustry and marketing activities of producer groups, agencies and PVOs in the region. The advisor will utilize an integrated farming systems approach to both rainfed and irrigated agriculture involving input from other technical experts in the areas of ecological and physical sciences, economics and anthropology/sociology.

The advisor will coordinate the contribution to the project of such technical and research institutions as the Centro de Investigaciones Fitoecogeneticas de Pairumani and Semilla de Papa. An inter-institutional agreement model or an indefinite quantity contract mechanism will be established to allow the project to draw on the expertise of these institutions as needed. In addition, the advisor will be responsible for maintaining an effective flow of technical information to farmer groups and agencies. S/he will also be responsible for seeing that information presented by CUMAT on land capability and soils will be presented to farmers in a form useful at the farm level.

The advisor will work closely with PADC and collaborating institutions in collection and analysis of data at the farm level. These data will provide a timely basis for changes in project activities in response to feedback from the farmer.

The advisor will collaborate closely with social science and irrigation specialists working with the PADC to assess current agricultural/livestock systems and identify where and when appropriate changes can be promoted in response to farmer needs or demands. Because of the serious problems of environmental deterioration and the saturation of the regional agricultural market, the farming system needs to be placed firmly in this broader context. Thus, changes in farming systems must not be limited to achieving increased production, but must take into consideration issues such as rural/urban terms of trade and the sustainability of innovations in production.

The advisor will also work with the PADC and collaborating institutions in the design and implementation of training activities for farmers and technicians. These will include short courses, farmer group meetings, field days, and daily farmer contact. In planning these activities, the advisor will coordinate with the PADC in developing the means of extending information to farmers on increasing agricultural production and improving the management of their natural resource base.

c. Long-term Advisor in Irrigation and On-Farm Water Management

The international advisor in irrigation and on-farm water management should have graduate training in hydrology and irrigation engineering. S/he should have at least ten years experience in small to medium scale irrigation system design and management in developing countries. Fluency in Spanish is a pre-requisite. Because the project has a relatively short programmed duration of three years, activities will be demand driven. This will require that the advisor work closely with farmers, farmer organizations and PVOs to identify and evaluate development opportunities.

The irrigation advisor will work primarily with the production division of the PADC in executing project activities through government and private agencies that work directly with farmers. Close coordination will be maintained with the international farming systems and social science advisors and their counterparts. The advisor will collaborate with watershed management activities in calculation of streamflow and sedimentation data important to irrigation planning.

The advisor will coordinate the rehabilitation of existing valley irrigation systems with responsibility for:

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- (a) providing operational support to agencies carrying out irrigation activities, with final responsibility for approving projects;
- (b) coordinating procurement of equipment as needs are identified;
- (c) evaluating the soundness of irrigation proposals based on hydrological data, water demand versus availability, drainage requirements, availability of construction materials and engineering design;
- (d) assuring that proposed irrigation water management is not in conflict with local usage, water rights or environmental concerns stipulated in the Environmental Assessment; and
- (e) Assuring that the proposed works are in harmony with local community organization, equitable distribution of benefits, accepted agricultural practices, and regional markets and farming economy.

As part of the project pre-investment activities, the advisor will coordinate such activities as water and salt balance studies, geohydrology mapping, main canal routing, and master water plan preparation.

The advisor will provide on-farm water management support to rainfed crop production activities. Included are technical feasibility studies for micro scale gravity-fed sprinkler and furrow irrigation systems and water conservation/drainage practices on the farm. This activity is particularly important in broadening the access of the regional population to irrigation benefits.

The advisor will work with counterpart institutions and individuals to establish a strong technical information base including published works, technical reports, and the storage and interpretation of quantitative data related to climatology, hydrology, water use, salinization, and crop yields.

The advisor will coordinate technical assistance and training related to irrigation. Training activities will include identification of professionals to conduct training, design of training activities and materials, and procurement of equipment.

## 2. Short-Term Technical Assistance

It is anticipated that short-term technical assistance will be required in support of several areas of project activity. The specific project areas, the kinds of technical specialists required, and the tasks to be performed are indicated below:

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a. Irrigation and Natural Resource Management

A geomorphologist with practical experience in studies of erosion and deposition will be contracted. The geomorphologist's tasks will include examination of the following subject areas:

1. Erosion - Where is it occurring? What is the cause? What can be done to minimize the process? How effective are management practices likely to be?
2. Sedimentation - From whence do sediments affecting irrigation infrastructure come? How can sedimentation be controlled?
3. Flooding - What criteria should be applied in the location and design of proposed bridges? How can the runoff peaks that cause flooding be reduced?
4. Stream corridor - How can it be managed effectively?

b. Evaluation Design

A social scientist with experience in designing and conducting evaluations will be contracted. The social scientist's tasks will include:

1. Design of a monitoring methodology for the Associated High Valleys project; and
2. Providing periodic assistance to the PADC staff in refining and adjusting its evaluation process.

c. Expert in the Use of Para-Technicians in Rural Development

The tasks of this expert will include:

1. Assessment of the need for and the existence of candidate para-technicians in the Associated High Valleys; and
2. Design of a training program for para-technicians to meet farmer demands in project areas.

d. Community Forester

The tasks of the community forester will include:

1. Design of a forest management and plantation forestry strategy for the Associated High Valleys; and
2. Training of foresters in the seedling production and management practices appropriate to each species recommended.

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e. Range Management Specialist

A range management specialist with practical experience in management of sheep, goats and cattle will be contracted. The tasks of this specialist will include:

1. Assessment of the carrying capacity of the range/forest land in the project area; and
2. Recommendation of management practices for the animals used in the area including possible annual improvement and use of supplementary feeding.

f. Farming Systems Agronomist

The tasks of the farming systems agronomist will include:

1. Identification of the major types of farms for the purpose of designing appropriate management plans;
2. Design of a low input management plan for each farm type; and
3. Implementation of a short course on tasks above.

It will also be important to draw upon short-term assistance to monitor the progress of the revised project's implementation. This monitoring will assess the progress of the PADDC in developing a strategy for reducing migratory pressure and undertaking projects that are consistent with that strategy. In addition, the decentralized organizational structure of the PADDC will need to be evaluated to see that it is having the desired results of promoting greater PADDC visibility, improved implementation of project activities, and increased local participation in project design and implementation. Finally, the success of the PADDC in coordinating the activities of other institutions within the context of a regional development model intended to reduce migratory pressure will need to be evaluated in order to assess the desirability of using the revised project implementation as a model to be applied in other areas that send large number of people to the Cnapare.

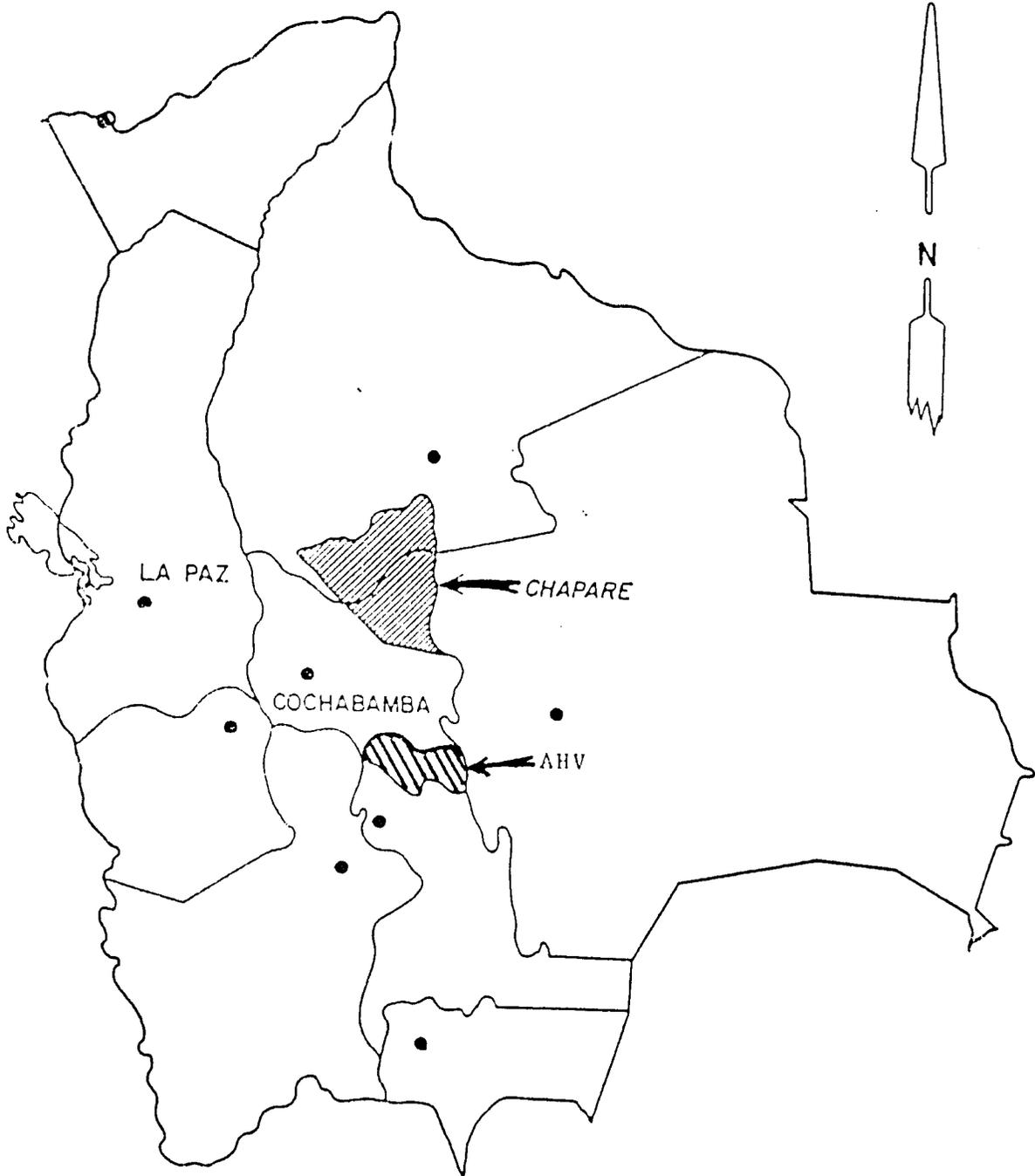
ANNEX J - MAPS

J-1: Map of Bolivia Showing Project Areas

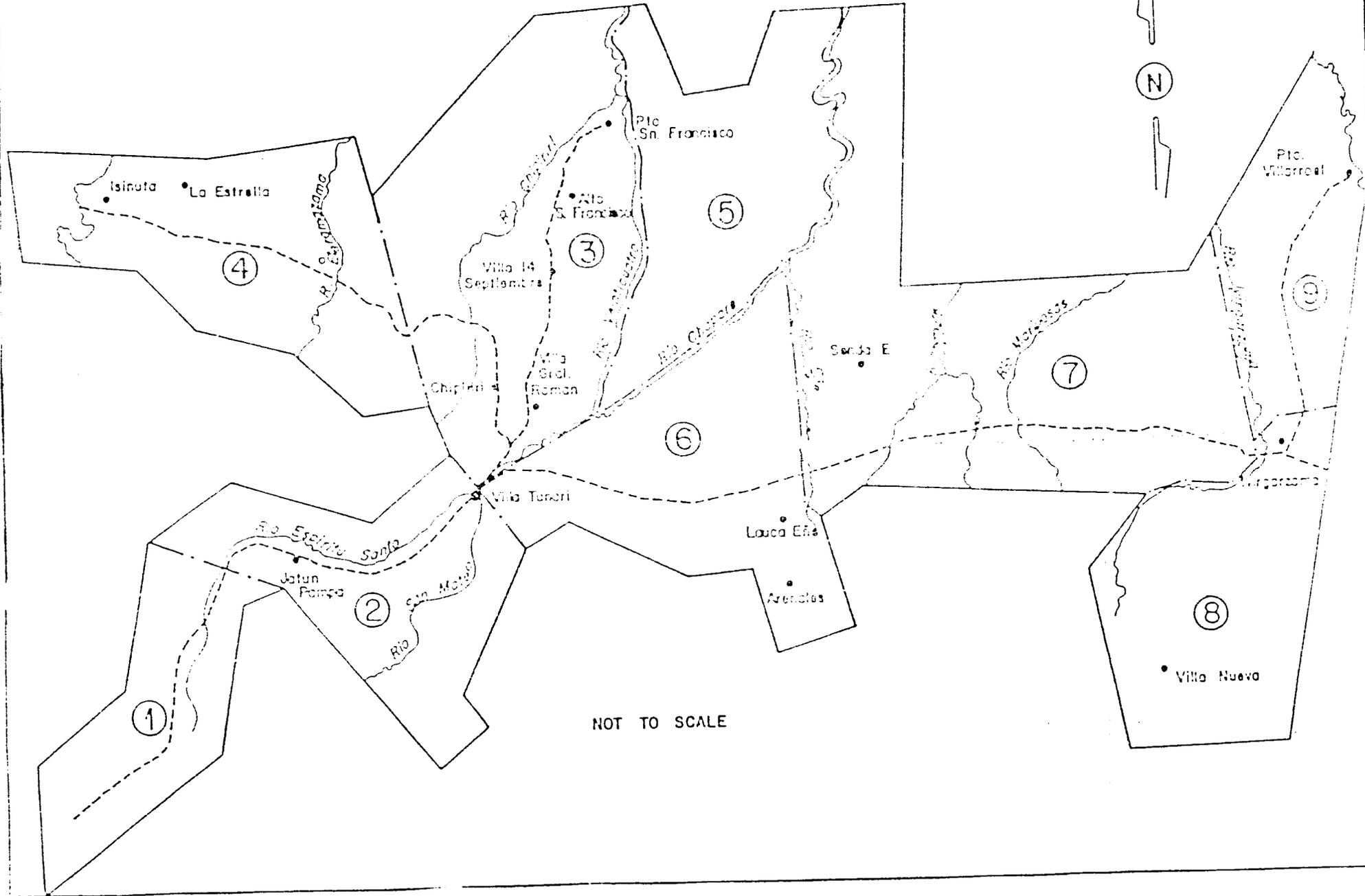
J-2: Map of the Chapare

J-3: Map of the Associated High Valleys

LOCATION OF THE CHAPARE AND ASSOCIATED  
HIGH VALLEYS REGIONS



CHAPARE



NOT TO SCALE

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# DEPARTAMENTO DE COCHABAMBA

Showing Associated High Valleys Project Area

(Black Border)

