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CLASSIFICATION

PROJECT EVALUATION SUMMARY (PES) — PART I

Report Symbol U-447

1. PROJECT TITLE	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
Agriculture Sector I	511-T-053	USAID/Bolivia

4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) 01-9

Final Evaluation

☒ REGULAR EVALUATION ☐ SPECIAL EVALUATION

5. KEY PROJECT IMPLEMENTATION DATES			6. ESTIMATED PROJECT FUNDING		7. PERIOD COVERED BY EVALUATION	
A. First PRO-AG or Equivalent	B. Final Obligation Expected	C. Final Input Delivery	A. Total	$ 14,850,000	From (month/yr.)	4/75
FY 76	FY 79	FY 80	B. U.S.	$ 9,200,000	To (month/yr.)	12/80
					Date of Evaluation Review	8/24/81

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

- ☐ Project Paper
- ☐ Financial Plan
- ☐ Logical Framework
- ☐ Project Agreement
- ☐ Implementation Plan e.g., CPI Network
- ☐ PIO/T
- ☐ PIO/C
- ☐ PIO/P
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

- A. ☐ Continue Project Without Change
- B. ☐ Change Project Design and/or ☐ Change Implementation Plan
- C. ☐ Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)

Isaac Torrico (RD)
Jorge Calvo (RD)
Water Fiorilo (EE)
José Luis Cabezas (DR)
Robert Thurston (RD)
Jaime Vizcarra (DPE)
Roberto León de Vivero (DPE)
Howard R. Handler (DPE)

12. Mission/AID/W Office Director Approval

Signature

Typed Name: Thomas L. Geiger
Acting Director

Date: August 24, 1981

AID 1330-15 (3-78)

13. SUMMARY:

The Agriculture Sector I project agreement was signed on April 24, 1975. The specific purposes of the project were: 1) to develop improved technologies and more modern management practices relevant to the small farm operators of the valleys of central Bolivia and the newly developing agricultural areas of the lowlands of eastern Bolivia; 2) to extend to these small farm operators improved technologies and more modern management practices; 3) to broaden the availability of and assure the target small farmer of improved access to needed inputs, information, financing, and markets; and 4) to develop the capacity of the Ministry of Campesino Affairs and Agriculture's (MACA) Offices of Economics and Statistics and Planning to generate basic data, analyze problems and opportunities, and formulate and implement coordinated policies and programs for the sector.

The project successfully accomplished the first project purpose of developing improved technologies and carrying out agricultural research, partially by having helped the Instituto de Tecnología Agropecuaria (IBTA) to develop its institutional capability for agricultural research. The second project purpose of extending improved technologies was not significantly achieved as it is estimated that 11,865 small farmers (55.3% of those projected) were reached. Despite the fact that additional farmers will be reached with new technologies through the project's Basic Food Production and Marketing (511-0451) companion grant scheduled to terminate on September 30, 1982, the prospects that this loan component's purpose will be achieved are not very optimistic. The third project purpose was successfully achieved in that

$5.0 million in agricultural credits was provided ($4 million from this loan and $1 million from the Government of Bolivia, GOB) to some 5,544 farm families (164% more than projected). The fourth project purpose, the sector management sector, was not successfully achieved due to high GOB personnel turnover and the GOB critical financial situation affecting the hiring of an adequate level of counterpart technicians. Nevertheless, it should be noted that the training outputs were achieved as planned and that MACA began to publish annual agricultural data (e.g. production area planted, yields) and price/marketing quarterly reports.

Significant problems in the construction and engineering aspects of this loan were encountered due to land titling problems and deficient designs. As a result, the contractors were only able: 1) to complete one service center, three experimental stations and one seed processing plant; and 2) to partially complete two remaining service centers (80% and 35%, respectively) and one additional experimental station (82%) as of the project TDD (9/22/80).

14. EVALUATION METHODOLOGY:

The primary purposes of this terminal evaluation were: 1) to assess the project's overall accomplishments by comparing actual versus planned outputs, purpose and goal level indicators, and 2) to draw lessons learned in managing similar projects in the future. The evaluation was designed in accordance with the project paper evaluation plan. The evaluation team consisted of the following USAID members: Jorge Calvo, a Rural Development agronomist; Walter Fiorilo, an Engineering and Energy civil engineer;

José Luis Cabezas, a Development Resources procurement specialist; Isaac Torrico, a Rural Development economist; and Jaime Vizcarra Cuéllar, a Development Planning and Evaluation economist. Additional inputs were received from Rural Development Chief, Robert Thurston, and from the USAID project committee.

The evaluation process included: a review of the most important project documentation (e.g. project paper, quarterly reports and previous evaluations); an extensive on-site evaluation (e.g. regional service centers in Cochabamba, Santa Cruz, and Sucre; the experimental stations of Saavedra, Toralapa, San Benito and Chinoli; and the Warnes seed processing plant); and a compilation of data and observations resulting from personal interviews with project personnel in USAID/B and the GOB executing agencies.

15. EXTERNAL FACTORS:

1) Socio-political situation: The socio-political situation has impacted negatively on the project by contributing to a high GOB personnel turnover directly resulting in less than adequate technician performance and project progress.

2) GOB financial situation: National budgetary limitations made it impossible to provide necessary funding for the project, affecting the hiring of counterpart technicians and the retention of a full extension staff, as well as the provision of adequate support and expansion of field efforts.

16. INPUTS:

16.1 Commodities

According to a field inspection performed by the evaluation team during November 1980, it was verified that only 80% of the commodities (e.g. jeeps,

pick-ups, tractors, soil laboratory equipment, shop tools, mimeograph machines, tape recorders) purchased under this loan were satisfactorily being used. This is attributable to: 1) the lack of adequate training provided related to the utilization of the equipment; 2) the absence of adequate facilities for the equipment (e.g. MACA printing shop in La Paz); and 3) a limited number of cases where adequate technical operational information for some equipment (e.g. atomic absortion, spectrophotometer, magnetic stirrers) was not available.

Several problems delayed the arrival of commodities purchased under this loan: 1) the lack of flexibility in the Bolivian Acquisition Law requiring an excessive-number of GOB certificates/registrations for bidding firms; 2) the length of time required to redispatch commodities from the time they are unloaded at port; and 3) the delays that frequently occur from the time that items enter into the consignee's warehouse to the moment they are sent to final users.

16.2 Agricultural Credit Fund

Loan funds were used to support a Bolivian Agricultural Bank (BAB) - run revolving credit fund to provide short and intermediate term production credit requirements of the target group with interest rates which were revised annually by GOB/BAB/USAID. The fund achieved the $5 million credit target established by the project and exceeded the number of planned beneficiaries receiving the credit (5,544 versus 2,095 projected).

16.3 Training

Thirty six long-term and twenty two short-term participants received agricultural training during the project life (see Section 17 Outputs). In

addition, 40 students have received thesis guidance and supervision from the Consortium for International Development (CID) consultants (funded under the Basic Foods Production and Marketing 511-0451 companion grant) through a loan funded "scholarship" program designed for this purpose.

16.4 Technical Assistance

The Basic Foods Production and Marketing project (511-0451) was established as a companion grant to this loan with the main purpose of providing the short and long term technical assistance needed for the loan financed activities. The grant calls for the provision of this technical assistance from 4/75 to 6/82, subject to the availability of incremental funding. Even though initial contract delays were experienced due to recruitment procedures, they generally did not affect the achievement of contract objectives. In fact, since the inception of the contract through October 1980, a total of 20 different advisors have worked in Bolivia with field positions being filled for 486 (87%) out of 560 months authorized. This assistance level was sufficient to assure successful agricultural research and technological development outputs (see Section 17).

17. OUTPUTS

17.1 Technology Development

Item	Planned Target	Total Achieved	Comments
Research studies	18	59	Target exceeded
Joint studies with universities	3	10	" "
Thesis projects	9	40	" "
Improve curriculum studies	2	3	" "
Improved courses	2	0	Liaison with universities not improved.

Item	Planned Target	Total Achieved	Comments
In service training	40	75	Target exceeded.
Short term courses	10	7	Target not reached.
Student training	180	40	Liaison with universities not satisfactorily improved.
M. S. degrees	14	23	Target exceeded
Experimental stations	4	3.82	San Benito, Saavedra and Chinoli experimental stations completed; Toralapa station 82% completed as of the evaluation date.

17.2 Technology Extension

Item	Planned Target	Total Achieved	Comments
Field demonstrations	10	30	Target exceeded.
Short courses	30	160	" "
Research bulletins	30	60	" "
M. S. degrees	3	4	" "
In service training	60	12	Extension advisor unable to complete scope of work due to CID personnel reduction.
Short term training	5	10	Target exceeded.
Agricultural Service Centers construction	3	2.5	The Santa Cruz Service Center completed; Cochabamba and Sucre 80% and 30% completed, respectively.
Seed Plant	1	1	The Warnes seed plant 100% completed.

17.3 Sectoral Management

Item	Planned Target	Total Achieved	Comments
M. S. degrees	6	8	Target exceeded.
In service training	15	45	" "
Short term training	6	6	On target

17.4 Agricultural Credit

Item	Planned Target	Total Achieved	Comments
Farmers receiving credit	2,095	5,544	Target exceeded.
Volume credit placed	$5,000,000	$5,000,000	On target. $4 million from loan funds and $1 million GOB contribution

Items	Planned Target	Target Achieved	Comments
M. S. degrees	1	1	On target
In service training	75	55	Target not reached
Short term training	8	6	Target not reached

The generally exceeded output targets noted above were verified by both first hand observations and CID reports. In this regard, research studies, thesis projects, field demonstrations and training outputs have greatly been surpassed due to: 1) the presence of an experienced technical assistance team (CID); 2) the adequate working relationships between CID and MACA technicians; and 3) the unexpected large response from the university students to get involved in thesis research. The fact that the agricultural credit component was also a success is attributable to the large number of farmers receiving credit (see Section 16.2 Agricultural Credit Fund).

One of the problems encountered throughout the implementation period was the deficient participation of the two universities located in the target areas --Universidad Mayor de San Simón (UMSS) in Cochabamba and Universidad Gabriel René Moreno (UGRM) in Santa Cruz--with the project technicians, attributable to the frequent closure of these two universities resulting primarily from the country's political instability. Other problems encountered related to the construction of the three agricultural service centers, the four experimental stations, and the seed processing plant. These included: 1) the high costs incurred for the foundations for the Cochabamba and Sucre agricultural service centers resulting from and insufficient number of test borings performed by the contractor; 2) the deficient and incomplete designs of the four experimental

stations by MACA attributed to its lack of necessary technical personnel; 3) the political and economical instability during the construction period resulting in personnel changes/cuts and reductions in originally planned GOB counterpart inputs; and 4) the increase in labor costs attributed to the November 1979 devaluation.

In spite of the above mentioned problems, by the TDD (9/22/80), the contractors were able to satisfactorily complete one service center (Santa Cruz), three experimental stations (San Benito, Saavedra and Chinoli) and the Warnes Seed Processing Plant; and partially complete the Cochabamba and Sucre service centers (80% and 35%, respectively) and the Toralapa experimental station (82%). To this effect, it should also be noted that MACA is employing its own funds to proceed with the remaining work on the Cochabamba service center and the Toralapa station, and that it is unlikely that MACA will be able to finance the Sucre service center.

18. PURPOSE:

Progress made towards achieving the four project purposes are summarized below:

18.1 Technology Development:

> "To develop improved technologies for use by the small farm sector of the inter-mountain valleys of Central Bolivia and the Eastern agricultural lands."

Objectively Verifiable Indicators

> a) "A set of specific recommendations developed for adoption at the farm level for (1) increasing production of corn, wheat, barley, rice, soybean, potatoes, and peanuts; 2) production of high yielding vegetables; and 3) improving management practices for increased output of dairy products, poultry and pork."

As a result of intensive station and on-farm research, CID/IBTA technicians are in a position to make substantive recommendations to assist the small farmer based on the progress made in the areas described below:

-- Germ Plasm. A significant amount of germ plasm was added to the Bolivian Germ Plasm Bank by the CID/IBTA technicians. As a result: 1) it was determined that native germ plasm can be useful in the improvement of food crops; 2) germ plasm was maintained in two areas of the country in order to assure that more varieties are converted to botanical seeds, as well as to reduce losses from virus contamination; and 3) 75 varieties were classified as to chromosome count and resistance to potato cyst nematode by "becarios" preparing their theses under CID technician guidance.

-- Wheat. Experiments showed that high technology inputs into wheat production would not be cost-effective for Bolivia at this time with the exception of the utilization of high yielding adapted seed varieties. In this regard, grain yields obtained were low as compared to other world wheat producing areas, and the cost required for fertilizers, herbicides and insecticides to produce higher yields proved to be prohibitive. Preliminary recommendations indicate that the use of normal farmer practices with improved seed varieties give the best net return albeit that higher yields are produced with fertilizers.

-- Barley and Oats. Experiments showed that further research in barley should be continued, specifically with varieties and the chemical control of yellow rust.

-- Corn, Soybean, Rice and Peanuts. Investigative work in corn, soybean, rice and peanuts has resulted in: 1) the increase of seed yields, as well

as the selection of two to three new varieties for each of the above mentioned grains; 2) the determination that soil fertility levels in the Santa Cruz area are usually adequate for rice, corn, peanuts and soybeans; 3) preliminary results showing that, although more studies are required, a continuous cropping system can be profitable; and 4) evidence that soil fertility decline under continuous cropping can be negligible with good management, contradicting previous data showing significant yields decline probably due to lack of weed control in subsequent years.

-- Insect Control. Entomological studies on T. Limbatriventris (stink bug which damages rice stem and whose saliva is toxic) were started in 1979-1980 where artificial populations were grown on rice in variety densities and results showed that increasing numbers of insects cause increasing damage. In addition, grasshopper population control with the use of chemicals in rice is being studied, as well as chemical controls for insects in soybeans and peanuts. As an activity separate from insect control studies, insects are continually being collected, prepared, identified, and placed in the National Insect Museum in Cochabamba.

-- Vegetables. No work was done in regard to high yielding vegetables, nor to improve management practices for increased output of dairy products, poultry and pork. This work for which MACA/IBTA had responsibility was not carried our primarily due to the lack of sufficient counterpart funds resulting from the precarious financial situation of the GOB mainly during 1979-1980.

b) "Three regional Agricultural Service Centers, located in the target area each staffed with at least 10 trained Bolivians planning, executing, and managing research and extension programs relevant to specific production problems."

The construction of the three service centers showed significant progress as of this evaluation (Santa Cruz, 100% completed; Cochabamba, 80% completed; and Chuquisaca 35% completed). Current construction plans indicate that the Cochabamba and Chuquisaca service centers could be fully operational by the end of 1981 and 1982, respectively, if and when GOB funds become available. The single most important factor in preventing the completion of the Cochabamba and Chuquisaca service centers can be attributable to the July 1980 coup which prevented the extension of the TDD (9/22/80) and consequently their completion. Other factors contributing to the delays can be attributed to the untimely supply of materials (see Section 16.1).

A total of 9 M.S. trained Bolivians are assigned to the Service Centers in the target areas. At the time of this evaluation the three Agricultural Service Centers were staffed as follows: 1) the Santa Cruz Agricultural Service Center with 3 M.S. trained Bolivians, 2) the Cochabamba Service Center with 5 M.S. trained Bolivians, and 3) the Chuquisaca Service Center with one M.S. Bolivian (see Table I).

The investigative work has been limited to the following areas in the service centers: 1) the Santa Cruz (Saavedra) station-mainly in corn, soybean, rice, peanuts and studies on continuous cropping; 2) the Cochabamba (Toralapa) station-potato and use of fertilizers; and 3) the San Benito station-wheat, barley and oats. The main results are discussed in Section 18.1.a.

c) "The MACA Research Division with 10 M.S. level Bolivians, identifying critical problem areas requiring research by Regional Agricultural Research and Service Centers."

A total of 7 M.S. trained Bolivians and 27 agronomists are assigned to the experimental stations of Saavedra, Toralapa, San Benito, Chinoli and IBTA/ Chuquisaca (see Table I), not including 4 M.S. technicians who left IBTA in search of better salaries in the private sector.

Most research at the experimental stations has been repetitive, partly attributable to the lack of use of annual evaluations in planning future year work plans. In 1978, CID pointed out their deficiencies to MACA/IBTA and recommended that IBTA's leadership required additional guidance. Although in 1979, IBTA requested and CID provided a counterpart for the IBTA director, very little was done at the experimental stations mainly due to the lack of coordination among the different experimental station directors.

The following table shows the distribution of support personnel on agricultural stations and service centers in the project areas that were in place at the time of this evaluation:

TABLE I

BOLIVIAN BACKSTOP PERSONNEL AT AGRICULTURAL INSTITUTIONS[2/]

Experimental Stations	MACA Departmental Office	Back Stopping M.S.	Agronomists	Personnel Graduates[1/]	Total
Saavedra (Santa Cruz	-	2	4	8	14
	Santa Cruz	1	6	2	9
San Benito (Cochabamba)	-	2	11	10	23
Toralapa (Cochabamba)	-	2	5	8	15
	Cochabamba	1	3	4	8
IBTA (Chuquisaca)	-	1	1	4	6
	Chuquisaca	-	3	4	7
Chinoli (Potosí)	-	-	6	2	8
	Potosí	1	3	4	8
T o t a l		10	42	46	98

Foot Notes from page 12:

1/ Graduates pending presentation of thesis dissertation.

2/ Agriculture service centers' staff include personnel assigned to the MACA departmental offices and the experimental stations. The experimental stations' personnel (primarily M.S. technicians) provide assistance at the service centers one or two days a week.

Source: MACA Research Division, 1980.

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d) "Two universities actively participating in MACA regional research activity and offering an expanded curriculum of relevant courses (including farm management, credit and marketing) and raising the level of educational qualification of faculty members in plant and animal sciences."

The Universities of San Simón (UMSS) in Cochabamba and Gabriel René Moreno (UNGRM) in Santa Cruz have expanded their curriculum of relevant courses to include entomology, fitopathology, irrigation and soil engineering; and several of the faculty members have received advanced training under this loan. In addition, there has been an increase in the participation of students from the universities in the IBTA/MACA research programs directly resulting from CID staff initiatives. On the negative side, the evaluation team noted that the unversities' staff and teaching level showed little improvement as a result of political problems inside the universities, as well as the low salaries paid to faculty members resulting in the departure of qualified instructors.

18.2 Technology Extension:

"To extend to small farm operators in target areas improved technologies and modern production practices "

Objectively Verifiable Indicators

a) "Central MACA Extension Service staffed with two M.S. level extension programmers, developing, planning and directing extension programs."

The central office of IBTA is staffed with the director of the extension program (M.S. degree) and three office assistants (engineering degrees).

The extension activities in MACA have been inadequate throughout the project implementation period and minimal extension planning continues to be carried out at the national level. The CID effort to correct this situation has not been effective primarily due to conditions within MACA (e.g. personnel changes and departures, organizational deficiencies, low priority placed on extension per se).

b) "Forty additional trained extensionists, including 10 subject matter specialists, (for a total of 30 extensionists) planning, executing and managing regional extension programs."

No additional extension agents' positions have been employed nor been made since 1978. A summary of the extension program resources and outreach is described in Table II, below.

TABLE II

EXTENSION AGENTS IN THE TARGET AREAS

Department	No. of Extensionists	No. of Farmers	Extension Km^2
Santa Cruz (Saavedra)	8	90,000	317,674
Sucre (IBTA)	12	30,000	42,056
Potosí (Chinoli)	8	71,000	10,600
Cochabamba (San Benito y Toralapa)	12	220,000	59,700
Total	40	411,000	430,030

Source: MACA General Direction of Agriculture, 1980.

c) "MACA extension division extends results of research studies to farmers in target areas."

Target

1976	1977	1978	1979	1980	Total
2,000	3,500	4,500	5,500	6,000	21,500

The actual number of farmers benefitting from the results of research studies during the project implementation period are as follows:

Achieved

1977/78	1978/79	1979/80	Total
4,286	3,700	4,000	11,886

SOURCE: IBTA Extension Division, 1980

The IBTA Chief of extension claims that 11,886 farmers (55% of the target) have been reached with improved technology during the life of the project -- an average of 100 farmers reached per extension agent each year. Nevertheless, taking into consideration the existing communication systems and the dispersion of farmers, the evaluation team felt it rather optimistic for the 11,886 farmers to be "effectively" reached with better technology.

d) "Distribution of improved seed by MACA among small farmers in target areas increased from 20,010 quintales in 1974 to 49,250 quintales in 1979."

(Note: 1 quintal = 101.4 English pounds)

The following table details the production and distribution of seeds.

TABLE III

PRODUCTION AND DISTRIBUTION OF SEEDS
(CWT)

Crop	1975/76 Prod.	1975/76 Dist.	1978/79 Prod.	1978/79 Dist.	% Increase % Decrease Dist.
Corn	-	-	2,700	2,000	
Hard corn	1,000	1,000	3,500	600	- 66.7%
Wheat	14,000	9,000	8,000	2,000	- 350.0%
Soybeans	5,000	5,000	16,000	16,000	+ 220.0%
Rice	300	300	3,000	2,800	+ 833.3%
Barley	-	50	2,000	1,700	+ 3300.0%
Oats	100	100	100	100	-
Potatoes	2,500	2,500	5,600	7,000	+ 180.0%
Pasture	50	50	700	4,500	+ 8900.0%
Total:	22,950	18,000	41,600	36,700	+ 1859.0%
% Dist.		78.2%		88.2%	

Average distribution increase: + 1,859.0%

Source: MACA Seed Department, La Paz, 1980

Comparing project inception (1976/1977) and latest available data (1978/1979) it is apparent that total average distribution of improved seeds has increased by 1,859.0%. Wheat and hard corn have decreased by 350% and 66.7%, respectively, probably because of less interest in that kind of production and/or their comparative quality. Soybean, rice, barley, potatoes and pasture seed distribution have increased impressively due to the acceptable quality and high demand for those products. Although there has been a clear increase in seed distribution, seed production capacity demand has not reached full capacity production level (50,000 CWT), because of: 1) the farmer's distrust of the seed program due to inadequate control and technology, and 2) the inadequate marketing policy and channels of distribution.

18.3 Sectoral Management

> "To develop the capability of MACA's offices of Statistics, Marketing and Planning to generate and disseminate basic data, analyze problems and formulate coordinated policies and programs for the sector."

Objectively Verifiable Indicators

a) "MACA's Economics and Statistic Office staffed with four trained (M.S.) professionals."

At the time of this evaluation MACA's Economics and Statistic Offices did not have any M.S. trained professionals on its staff. The only M.S. professional who worked in 1979/80 was forced out due to personnel changes following the July 1980 coup.

b) "MACA's Economic and Statistic Division is publishing quarterly time series on agricultural production, crop forecast and consumption of agricultural products."

Since agricultural production, area planted and crop yield information is useful only on an annual basis, these reports are being published on a year-by-year instead of quarterly basis. In addition, two reports covering the period from 1978 to 1979 have been published on agriculture, statistics, crop forecasts and consumption of agricultural products.

c) "MACA's Marketing Office publishing at least quarterly reports on prices and marketing of agricultural products and inputs."

This office has established a system assuring for the continuous collection, tabulation, and publication of quarterly reports on prices and marketing; and has completed six additional marketing studies during the project life.

To date the Marketing Information Service unit produces quarterly reports on price policy. The reports are of limited use at this time because of the existing ineffective government price control.

d) MACA's Planning Office staffed with at least four trained M. S. professionals."

Data to evaluate this indicator was difficult to obtain due to the low priority given by the National Director's (MACA Planning Office) to USAID activities. Nevertheless, information from previous evaluations and previous MACA personnel indicated that 2 M. S. were working at the time of this evaluation in the Planning Office, while 3 M. S. trained Bolivians had to leave as they were not able to develop acceptable working relationships with the National Director of Planning.

e) "MACA's Planning Office publishes each year an agricultural plan."

Revisions are being made on the Five-Year Agricultural Plan as new data becomes available and annual operation plans continue to be published by this office.

The CID long-term advisor, who completed his two-year tour in July 1978, provided advisory planning services to this office, and undertook/guided various research projects leading to the publication of 12 working papers/articles in collaboration with Bolivian technicians.

f) "A sample frame developed and implemented for basis of national area and production statistics."

The area frame survey was developed during 1978-1979 and was completed in early 1980 in that portion of the Department of Santa Cruz west

of the Rio Grande. This survey was designed as the first large scale effort to test the work accomplished to date in the preparation of a national area sampling frame. The long-run objective of the national frame is to create a tool through which annual or more frequent, reliable estimates may be made in areas as livestock inventories, crop production, land use intensity and some socio-economic characteristics.

With the cooperation of the U. S. Department of Agriculture, a processing system was being installed on the IBM computer at the State owned petroleum coporation (YPFB) for processing the data collected in the Santa Cruz survey. It was decided at the time of programmatic changes following the July 1980 change of government in Bolivia to discontinue all USAID support of that effort. Work within the MACA continues (to some degree) on the development of the national area frame and on manual editing and tabulation of the Santa Cruz data.

Objectively Verifiable Indicators

a) "An established and well functioning division of the Banco Agrícola de Bolivia channelling credit to small farmers producing basic foods. Within this institution a revolving credit fund established to handle the short and intermediate-term production credit needs of the small farmer target group.

Under the project a total of $5 million dollars has been assigned to create the Small Farmer Credit Program (SFCP) within the BAB. Four million dollars came from loan funds and one million from the GOB contributions, benefitting 5,544 families. These loans have been used both

for short-term production credit and medium-term farm investment loans. To date, delinquency represents only 3% of the total portfolio. The implementation of the SFCP under this project could be considered as a success. Nevertheless, the future success of the SFCP program will be dependent on the implementation of consistent and unbending credit policies, as well as on an administration free from possible special interests created by an unstable socio-political environment.

b) "An established agricultural information system with the MACA providing farmers and credit institutions adequate production and marketing information."

The MACA's marketing office publishes a quarterly marketing magazine "Noticias de Mercado" containing production, and marketing information.

19. GOAL/SUB-GOAL:

Progress made towards achieving the two project goals is summarized below:

Sector Goal:

a) "To increase per capita income and standard of living of rural people."

One of the objectively verifiable indicators was an increase in the GDP for the agricultural sector from 2,320 million Bolivian pesos in 1975 to 2,611 million in 1979 in constant pesos. The figures indicated in the logical framework are not comparable with the official figures used in Bolivia.

The Musgrave Commission found that GDP figures for agriculture were underestimated and adjusted them accordingly. Table I, which has the corrected figures for the GDP corresponding to the 1972-1979 period, shows that the annual rate of growth over the period has been 5%--higher than the 3% growth proposed in the project paper. It should be noted, however, that there are obviously other economic factors that contributed to this change (e.g. other sectoral investments, general economic growth).

TABLE IV

GROSS DOMESTIC PRODUCT CORRESPONDING TO THE AGRICULTURE SECTOR
(Millions of Bolivian Pesos)

Year	1970 Pesos	Current Pesos
1972	2,512	3,099
1973	2,628	4,738
1974	2,725	8,265
1975	2,907	9,022
1976	2,991	10,052
1977	2,890	11,278
1978 1/	2,968	13,456
1979 1/	3,027	17,562

1/ Preliminary estimates

Source: Banco Central de Bolivia: "Boletín Estadístico No. 238", La Paz, June 1980.

b) "The share of production of small farm sector that is marketed increased from 47% to 60% by 1979."

Sub-Goal:

"Increased production and increased factor productivity of basic food crops and livestock production in the small farm sub-sector of the intermountain valleys of Central Bolivia and the developing agricultural areas of the lowlands of Eastern Bolivia."

The goal was reasonably attained assuming that the preliminary estimates from the National Socio-Economic Farm survey are correct, indicating that approximately 55% of the small farmers production was marketed in 1978. 1/

1/ "Estimaciones Preliminares de la Encuesta Socio-Económica Nacional", MACA, Departamento de Estadísticas Agropecuarias, La Paz, 1980.

Measures of sub-goal achievements were to be based mainly on: 1) production of key crops and per hectare yields (see Tables V and VI); and 2) the project impact by the end of 1979 on 6,500 farm families.

The first measure of sub-goal achievement is crop production for which Table V shows the production figures for selected crops during the 1975-79 period.

TABLE V

PRODUCTION OF KEY CROPS OF CENTRAL VALLEYS AND LOW LANDS, BOLIVIA 1975-1979 1/
(000 Metric Tons)

Crop	1975	1976	1977	1978	1979	Goal
Wheat	61.8	69.8	48.1	56.0	53.9	66.2
Corn	305.0	342.1	299.2	331.1	334.7	355.2
Barley	79.6	91.8	59.8	63.5	61.8	82.5
Rice	126.6	113.0	111.7	93.4	82.0	105.6
Soybeans	11.9	15.4	8.6	26.2	34.8	5.1
Peanuts	15.3	14.3	16.0	11.8	14.0	12.6
Potatoes	834.1	823.9	678.6	716.1	720.0	966.2
Yuca	285.4	304.7	294.4	210.5	224.0	330.8
Vegetables 2/	223.8	202.0	204.9	200.4	184.8	222.3

Source: MACA, Departamento de Estadísticas Agropecuarias, La Paz, 1980

1/ Data was available for the 1975-1979 period only.
2/ Sweet corn, onions, tomatoes and green peas.

As may be observed there has been no consistent increase in the production of any crop during the 1975-1979 period, except for soybeans. In fact, production figures declined for wheat, barley, rice, peanuts, potatoes, yuca and vegetables, and increased only slightly for corn.

Officials in the MACA attributed the poor performance of the sector in 1979 to the severe drought which occurred in the country in this particular year. The evaluation team believes that a major cause for the poor performance of

the agricultural sector is due to the GOB policy which has discouraged the production of certain key crops (see Tables V and VI) by controlling their prices.

The second measure of sub-goal achievement is the increase in yields per hectare of key crops produced by small farmers for which Table VI shows the yields for selected crops during the 1975-1979 period.

TABLE VI

YIELDS OF KEY CROPS, BOLIVIA 1975-1979
(Kg/ha)

Crop	1975	1976	1977	1978	1979	Goal
Wheat	803	864	655	646	620	970
Corn	1,325	1,453	1,228	1,292	1,372	1,522
Barley	713	793	534	707	650	817
Rice	1,700	1,575	1,707	1,420	1,472	1,643
Soybeans	1,266	1,270	1,200	1,350	1,431	1,611
Peanuts	1,500	1,300	1,315	971	1,000	1,204
Potatoes	6,532	6,422	5,406	4,566	4,500	8,937
Yuca	13,101	13,850	12,800	14,341	14,000	13,109

Source: MACA, Departamento de Estadísticas Agropecuarias, La Paz, 1980

As may be noted above, the 1979 crop yields are generally lower than those projected in the project paper. Poor yield performance of these crops (see Table VI) can be partly attributed to the lack of application of new technologies developed under the companion grant. The increases in yuca, soybeans and corn, on the other hand, can be attributed to: 1) the relatively high demand for those crops as a result of the establishment of food processing plants during the past few years; 2) the traditional importance for local household consumption (primarily corn and yuca); and 3) the limited application of new technologies developed under the companion grant.

A third measure of sub-goal achievement is the project impact on the projected number of beneficiaries, i.e. 16,500 farm families. In this regard, it is estimated that the project interventions--agricultural credit and improved technology to farmers--only impacted on slightly more than half of the targeted farmers due to unsatisfactory technology extension efforts. Nevertheless, it should be noted that: 1) loans given through the Small Farm Credit Program directed towards increased production and farm investment resulted in increased farm sales and therefore increased family income; and that 2) farmers' limited exposure to new technology is beginning to improve traditional agricultural practices related to production deficiencies. Specific examples of achievement have been the increased yields of soybeans, yuca and corn which in turn increased incomes.

20. BENEFICIARIES

The intended beneficiaries of this project are approximately 200,000 small farmers of the central Bolivian valleys and the developing lowlands in the Santa Cruz area. The small farmers close by the experimental stations benefitted most directly from the improved technologies developed as demonstrated by their increased soybeans, yuca and corn production.

Direct project beneficiaries are the 58 MACA/IBTA technicians who received long-term (36) and short term (22) agricultural training during the project life, as well as the 81 students who received thesis guidance and supervision from CID scientists.

21. UNPLANNED EFFECTS:

The CID managed scholarship program to assist students (81) to prepare their theses has had a positive impact in changing faculty attitudes towards the importance of new methods in agricultural research and experimentation. This has been the most important CID input into the two universities involved in the project.

22. LESSONS LEARNED:

1) In view of personnel constraints the Mission's engineering backstop support to the executing agency for implementation of the construction activities proved to be insufficient. It is recommended that project designs having large infrastructure components include a budgetary line item for a full time engineer advisor to work with the counterpart agency in order to facilitate the construction activities.

2) The project design did not place adequate emphasis on the time and effort required for extension activities with which to implement new technologies to the small farmers. In order to insure that new technologies have the desired impact on the small farmer in future projects, the project designs must include: 1) an extension program that is well organized and adequately staffed, and 2) adequate counterpart funding to support the extensionists' activities in the field.