

PD-AAL-871
ISN = 14687

53



CHEMONICS
INTERNATIONAL CONSULTING DIVISION

PROGRESS REPORT
JULY THROUGH DECEMBER 1981

SUBMITTED TO
THE MINISTRY OF RURAL AFFAIRS AND AGRICULTURE

BY
CHEMONICS INTERNATIONAL CONSULTING DIVISION

CONTRACT GOB/AID 511-059-008-HCC
(PREVIOUSLY 511-111)

MARCH 8, 1982



La Paz, March 8, 1982

CHEMONICS
INTERNATIONAL CONSULTING DIVISION

Eng. Jaime Sejas
Director General
Ministry of Rural Affairs
and Agriculture
La Paz

Dear Eng. Sejas:

We wish to express our pleasure in submitting to you Chemonics' Progress Report corresponding to the period July through December 1981. We believe that the achievements during the semester have been substantial. As can be seen in the Introduction and Conclusions and Forecast, the objectives for the semester were formulated for ideal conditions, that is, assuming that neither financial nor personnel limitations would occur in the implementation of the programs.

We consider that the achievement of objectives in the area of seed improvement were almost a 100 percent, but in the area of land clearing only between 60 and 70 percent. The latter was mainly due to the lack of equipment and personnel on the part of CODETAR to begin the field maintenance program. In the area of soil conservation all objectives related to the initiation of this program were achieved. In regard to sector planning and organization and methods, approximately 75 percent of the objectives identified have been fulfilled. The reason for this is the lack of participation of personnel of MACA.

Progress during next semester, January through June 1982, depends even more on financing of the T-059 Project of USAID support provided by MACA, CODETAR, IBTA and other Bolivian institutions.

Sincerely yours,

Preston S. Pattie
Preston S. Pattie
Chief of Party

TABLE OF CONTENTS

	<u>Page</u>	
SECTION I	INTRODUCTION	1
SECTION II	PROGRESS IN FIELD ACTIVITIES	
	A. Seed Improvement	3
	B. Maintenance of Heavy Equipment and Agricultural Machinery	14
	C. Soil Conservation	22
SECTION III	PROGRESS IN INSTITUTIONAL STRENGTHENING	
	A. Sector Planning	24
	B. Organization and Methods	27
SECTION IV	PROGRESS IN PROJECT COORDINATION AND ADMINISTRATION	
	A. Background and Objectives	29
	B. Progress in Coordination of Tech- nical Areas	30
	C. Summary and Suggestions	34
SECTION V	SUMMARY OF RECOMMENDATIONS	36
SECTION VI	CONCLUSIONS AND FORECAST	38

SECTION I

INTRODUCTION

SECTION I
INTRODUCTION

The Contract GOB/AID 511-059-008-HCC (formerly 511-111) signed between the Ministry of Rural Affairs and Agriculture and Chemonics International Consulting Division was originally approved for a two-year duration, June 1979 through June 1981. Amendment number 6, agreed upon between said institutions and approved by USAID/Bolivia, extended the Contract for six months, from July through December 1981, which corresponds to the period of this progress report. During this semester, amendments numbers 7 and 8 were signed, these agreements provide funds for the hiring of a long-term expert in soils conservation, and to extend the Contract between MACA and Chemonics until November, 1982.

The technical areas in which Chemonics participated actively during the period of the present report (July through December 1981) are: seed improvement, maintenance of heavy equipment and agricultural machinery, soil conservation, sector planning and organization and methods. The long-term advisers who participated in the work are the following:

- * Dr. Adriel A. Garay, Seed Specialist
- * Mr. Leslie Ríos, Heavy Equipment Maintenance Technician
- * Lic. Robert Sparks, Adviser in Organization and Methods
- * Mr. Terrence McCarthy, Adviser in Machinery Maintenance
- * Dr. E. Don Hansen, Adviser in Soil Conservation
- * Dr. Preston Pattie, Chief of Party

Lic. Sparks finished his tour in Bolivia on July 17th, and steps were taken to conclude the work in the area of organization and methods. Mr. McCarthy began to work in October as a short-term adviser, but with the extension of the Contract between MACA and Chemonics, he retroactively converted to the standing of a long-term adviser. Mr. Hansen began to work in December as long-term adviser, however, the corresponding costs are charged to loan T-059, instead of charging to grant funds, as is the case of the other advisers.

One short-term adviser provided services during the semester of this report, Dr. Luis Ampuero Ramos, Agricultural Economist. Dr. Ampuero began work in coordination with the Direction of Sector Planning on October 1st.

The next section details progress in field programs, first presenting background and objectives, secondly progress achieved, and finally suggestions. The three field programs in which Chemonics provided assistance in the report period are:

- * Seed Improvement
- * Maintenance of Heavy Equipment and Agricultural Machinery
- * Soil Conservation

Similarly, section III presents progress in institutional strengthening corresponding to the following technical areas:

- * Sector Planning
- * Organization and Methods

Likewise, section IV presents progress made in coordination and support of the five mentioned programs, and progress made in management of Project T-059 resources under the responsibility of the consulting company.

Section V contains the summary of recommendations and section VI underlines conclusions and objectives for the next report period, January through June 1982. It should be noted that the strategy in formulating objectives is to establish attainable goals under optimum conditions. Hence, an attempt is made to formulate objectives not only for Chemonics, but also for the programs in which the advisers provide assistance. The achievement of these objectives depends not only on the technical assistance provided by the consulting company, but especially depends on the resources devoted by the Bolivian institutions participating in the programs, notably, MACA, COFETAR, and IBTA. Consequently, it is important that these institutions and others associated with the programs examine the objectives outlined in section VI with the purpose of reaching a common agreement. Based on the requirements and objectives identified, work plans of the advisers need to be refined.

SECTION II

PROGRESS IN FIELD ACTIVITIES

SECTION II

PROGRESS IN FIELD ACTIVITIES

A. Seed Improvement

1. Background and Objectives

At the beginning of the semester preliminary installation of the processing plant in Warnes was in its final stage. Seed produced in winter 1980-81 was totally lost because of heavy and delayed rains and because of the lack of equipment for artificial drying. A program for the production of soybean seed in winter had been initiated in coordination with ANAPO, CIAT and MACA.

The first objective was to continue supervision of these seed lots in the field and in the phase of processing at the MACA plant in Warnes. This objective included initiation of operations in the plant and on-the-job training for MACA personnel on processing techniques, operation and administration of the plant, and on seed quality control. One objective was to couple these activities with a special training program for personnel of the MACA's Seed Department from other areas of the country. Financing for this training had been requested from USAID.

Further, Chemonics wished to support MACA in initiating a program for the production of soybean, corn and rice seed in summer 1981-82. For this purpose, an objective was to initiate the formation of a seed certification service and to form a team of technical personnel specialized in field inspections and quality control. It was desired to help MACA in encouraging the utilization of high quality seed in coordination with CIAT, ANAPO, and other producer associations. Additionally, an important goal was to provide support in the formation of the seed program in the Chaco in coordination with MACA, IBTA, the producer associations of the area and the Gran Chaco Integral Cooperative.

Finally, during the semester additional needs arose for the program, one in planning the strategies for the seed program, and another in the

acquisition of screens for the plant in Warnes. As a consequence of the seed program evaluation involving the use of funds from the T-059 loan, an agreement was reached with MACA and USAID in the sense that Chemonics would provide assistance in the establishment of priorities among crops and areas of concentration for the next two or three years. The need was also seen to identify the current capabilities and future requirements for production of foundation seed, certification services, and processing in each zone.

2. Progress

This section is divided into five parts corresponding to the production of foundation seed, the certification program, seed processing, training of MACA's personnel, and planning to establish strategies for the seed program.

a. Production of Foundation Seed

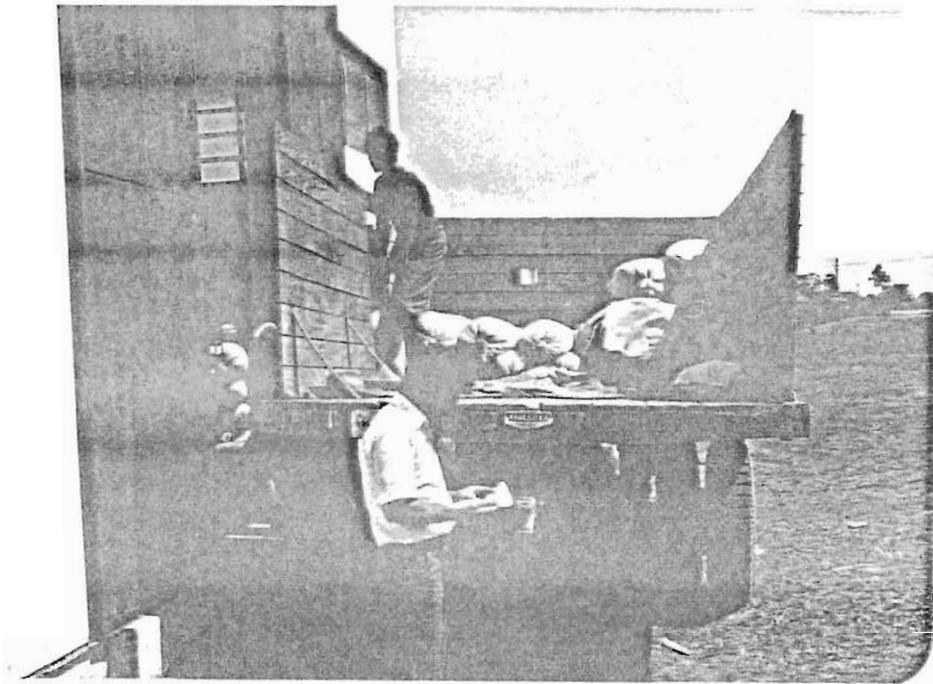
Previously this activity had been initiated with the cooperation of CIAT at the Saavedra Experimental Station. This year, CIAT is increasing its activity by means of contracts with farmers outside the experiment station. Fields will be supervised by CIAT technicians in cooperation with MACA. This same system was recommended for IBTA in the Chaco and in Cochabamba.

In meetings held with PROMASOR, to use corn foundation seed produced by CIAT was recommended to seed producers. In this way, the same model that was implemented with soybeans can be applied to other crops.

Chemonics' Adviser participated in a conference on corn seed in CIMMYT, Mexico, an institution that generates new varieties and sends them to Bolivia for final selection. During the conference, methods of formation and maintenance of foundation seed were explored, which will be implemented in seed multiplications starting in 1982.

b. Certification Program

During the winter campaign there were three technicians of the MACA's Seed Department working in Santa Cruz who were supported part-time by four technicians/trainees from other departments. Therefore, work



Reception of soybean seed, Warnes, October 1981.



Laboratory analysis for quality control in the Conditioning Plant, Warnes, November, 1981.

in field inspections and the process of preparing seed producers was progressing relatively well. This team of personnel supervised the production of approximately 600 has. of soybeans and around 50 has. of corn. As a result of this effort producers have improved their knowledge considerably. However, roughly two more campaigns might be required until seed producers are well trained in the production of soybean and corn seed. Improvement is still needed in identifying varietal mixtures, insect control, recognition of seed maturation, need of immediate drying after harvest, and other practices. In addition, seed producers will have to install drying and processing facilities on their own farms in the future.

As a result of the winter program, more than 600 metric tons of high quality soybean seed were produced, out of which 500 tons were of sufficient quality to be certified. In addition, around 100 tons of good quality corn seed were produced, however, it did not yet reach the certifiable level. These production levels represent a record in Bolivia, exceeding the expectations of those who participate in the program in terms of quantity and specially in quality. The feasibility of producing soybean seed in winter, which produced a quality equivalent to that of imported seed, has been proved, and at a cost less expensive for the farmer. The 600 metric tons of soybean seed represented a 25 percent of the 1981 national demand, and it is expected that in the second year of the program a production of around 1,500 tons can be reached.

At the beginning of the summer campaign, MACA's technicians were completely engaged with the processing work in the plant in Warnes. Consequently, personnel to provide technical assistance in the field to seed producers is not available. Anticipating this evolution Chemonics developed a project to establish a certification service in the area of Santa Cruz, recommending that the program be implemented through CIAT. However, the financial limitations have not been overcome, and until the end of the semester the problem of personnel to carry out field inspections has not been resolved.

On the other hand, the importance of starting a seed program in the Chaco has been recognized. This is important to reduce the risks associated

with the climate in tropical areas. In 1980-81, only 20 tons of soybean seed were produced in the Chaco under the supervision of MACA; this was processed and stored in Tarija. It is considered that the need for seed this year will be some 300 tons. For this reason, Chemonics emphasized on-the-job training in Santa Cruz, which was attended by two technicians of the MACA's Seed Department who work in the Chaco. In November Chemonics' advisers visited the institutions in the Chaco with the purpose of identifying the needs and the role that each institution should accept in seed production, certification, and processing. However, continuous efforts are required to put the program in operation.

c. Processing and Marketing

In August assembly of processing machinery was completed along with the electrical installation at the plant in Warnes. The plant began work in August 17, and worked continuously since that date until the end of the year. The equipment installed consists of four bins for artificial drying with a total capacity of 10 metric tons per day, a CRIPPEN cleaner/classifier with an installed capacity of up to 1 ton per hour, a seed treater and sacker. The current installation is the minimum to allow initiation of the seed program, but lacks complementary equipment in order to exploit the real capacity of the CRIPPEN and thereby increase the capacity of the plant. Further equipment for more precise seed selection is not available. Chemonics acquired additional screens for the CRIPPEN; also, a psychrometer and a hydrothermograph were purchased to control the drying process. This equipment allowed the drying of most of the winter seed with natural air, obtaining savings of diesel fuel for MACA.

In the beginning, producers did not intend to have their seed processed in the plant. Concerns were expressed regarding price, quality of work, the possibility of mixing their seed with that of another owner, delays that might occur, and others. A day of demonstration was organized in coordination with ANAPO by which the very orderly system of administration and operation of the plant was demonstrated. The farmers saw the importance of artificial drying, cleaning, classification, analysis and labeling. The proof of the demonstration lies in the quality of the final product, which showed to farmers the

benefits obtained through processing. The soybean seed produced in winter is larger than imported seed and with greater variation in size. Consequently, once the demonstration was over, farmers requested that seed be classified in two sizes which allows better calibration of the seeder to obtain the desired population of plants. This fact makes clear the need for involving the farmer in decisions about the operation of the program, and indicates the ability shown by farmers to adopt new technologies.

Classifying seed in two sizes concentrates the unripe and light grains in the small size. Therefore, some lots of this size did not reach the certifiable quality. This implies the immediate need for a gravimetric table. The Seed Department sent a gravimetric table to Santa Cruz in November, but the platform which it has is for smaller grains such as wheat, sorghum and rice. Another platform for soybean and corn should be acquired.

Chemonics' adviser concentrated an appreciable part of his time in training his MACA counterparts in aspects of seed processing, and in the systematization of processing operations and quality control from reception of seed until delivery to the owner. The drying, cleaning, classification and control phases in the plant have been implemented with Eng. René Arancibia, and the sampling, analysis, and labeling phases were carried out with the seed analyst, Martha Soliz. Through continuous contact with the producers during processing of their seeds, technical recommendations were imparted, and it was possible to evaluate the attitudes of seed producers as to the effects of the program in the field.

Within the current model for the seed program implemented in Santa Cruz, the seed producer maintains ownership and is responsible for his product throughout all phases, and therefore, accepts all corresponding risks. This is possible because there is a good market for seed and an attractive price. Reasonable economic incentives must be provided before insisting on fulfillment of necessary technical practices in the field and in the seed plant, despite the high investments that this implies.

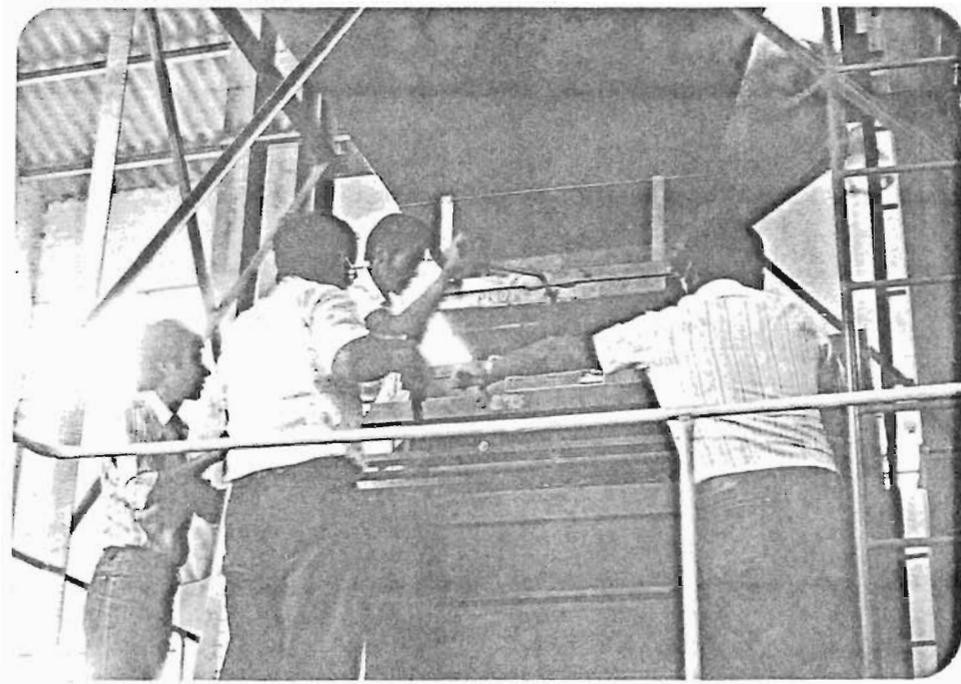
Due to the fact that MACA offers drying and processing services in this stage of seed industry development, the producer or the potential seed companies, are not faced with the need to have their own infrastructure.

However in the future, private enterprises must install their own plants. Recently, a producer in the area of Santa Cruz has begun the installation of a small drying facility similar to the one at the plant in Warnes. There are also other groups which are obtaining prices on machinery for their own processing plants. This strengthens the belief that the public sector should not enter into marketing of seeds, but instead should provide services and encouragement necessary for the development of the private sector. Without this strategy the dynamic development of the seed industry in Bolivia will not be possible.

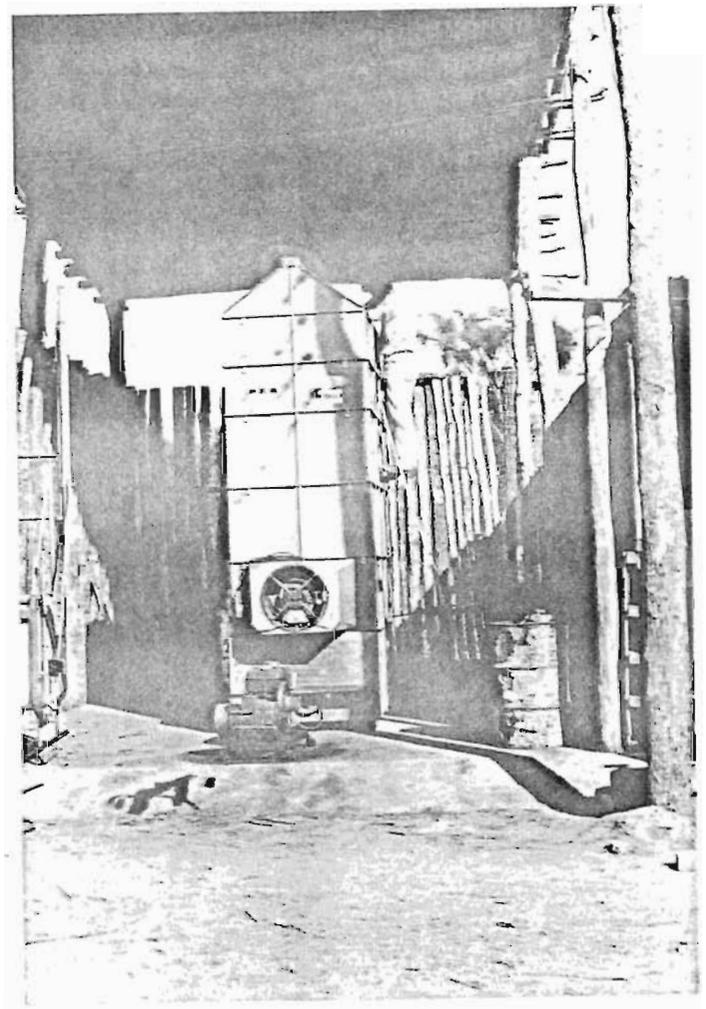
d. Special Trainings

A training program, which lasted more than two months, was carried out with four technicians of the MACA Seed Department. Participants were: Eng. Eduardo Guarachi, Regional Representative in Betanzos, Potosí; Eng. Julián Vidal, Regional Representative in the Chaco; Eng. Hugo Bustamante, Head of the Processing Plant in Cochabamba; and Agricultural Technician Ivar Carzon, Assistant in Tarija and the Chaco. The costs for this training were financed with funds of the T-059 loan of USAID. The trainees joined the work of the seed program in Santa Cruz in the same way that local technicians, directly participating in field inspections, laboratory analysis, and processing. They became familiarized with the organization of the program and the coordination that exists among ANAPO, CIAT, the Seed Plant of MACA, and seed producers. The trainees received selected bibliographic material to complement practical training, and exams were taken at the beginning and at the end of this training.

Another on-the-job training program in seed analysis was carried out with Eng. Reinerio Ortíz, employee of CIAT and ANAPO. Eng. Ortíz provided support to the seed program by participating actively in the laboratory of MACA in Warnes for a period of 2 months. Another activity regarding training includes the support given by the Chemonics Adviser to ANAPO in preparing informative bulletins related with the soybean seed utilization. Also at the invitation of ANAPO, the adviser participated in the 24 de Septiembre Fair in Santa Cruz as a panelist to present the achievements of the soybean



Trainees participating in the processing phase, Warnes, October 1981.



Inspection of a grain dryer in the Algarrobal Experimental Station in the Chaco, November 1981.

seed program.

e. Planning for the Seed Program

The Seed Adviser and the Chief of Party of Chemonics analyzed operational problems of MACA in Warnes with the participation of other people interested in the program. A memo was prepared for the National Director of Seeds, which included suggestions to resolve the identified problems. The main problems encountered in the program are due to the lack of personnel at all levels. A great many workers are required for the manipulation of bagged grains. For example, the drying machines were unloaded manually and the seed is bagged again to be taken to the CRIPPEN seed cleaner. As a consequence of this, the plant was processing only one ton per hour, and working only 7 to 8 hours per day. The capacity had to be doubled in order to handle 600 tons of soybean seed during the two-month period, September and October. Besides the need for additional workers, another technician was required to assist the head of the plant, which would allow working two shifts each day. Additionally, a mechanic was needed to constantly service the machinery. There are no spare parts available in the country for any of the machinery existing in the plant, therefore, there were great possibilities of suffering long delays in work due to lack of timely maintenance. Further, the few employees of the Seed Department in Santa Cruz were fully engaged in processing tasks and laboratory analysis. Therefore, field inspections remained completely neglected during harvest.

After discussing this document with MACA, Chemonics received approval to prepare a plan to establish a Seed Certification Service in Santa Cruz. This project, prepared in consultations with interested sectors in Santa Cruz; describes the needs of personnel and equipment for the implementation of the service in the short-run, and presents an operating budget demonstrating the feasibility of self-financing.

Regarding planning of the national seed program, the advisers initiated a meeting with the National Director of Seeds in June, with the purpose of starting a dialogue about priorities for technical assistance and the better use of funds of the T-059 loan of USAID. Later the advisers attended the

meeting on the evaluation of the national seed program carried out by DPS of MACA and USAID. As a result of this meeting, a work team was formed among DPS, the Seed Department and Chemonics to establish priorities and strategies of the program and to determine investment needs required within the next two or three years. Following preliminary meetings in La Paz, a series of visits were carried out in Santa Cruz, Yacuiba and Cochabamba for the inspection of MACA's facilities and to interview technicians and authorities of other institutions. During these interviews aspects of foundation seed production were considered along with production of certified seed, processing and/or marketing. As a result, Chemonics prepared a report on these activities with concrete analysis and recommendations. This report has the purpose of serving as a working document in the planning process of MACA. The document was prepared to be distributed to the participants in the evaluation of the seed program in January, 1982.

3. Summary and Suggestions

The objectives of the seed program for the semester were very ambitious, however, they have been almost totally achieved. The rapid progress that can be obtained by developing seed producers has been demonstrated, along with the corresponding results in terms of increases in quality and quantity of seed produced in the country. This experience has had the effect of creating high expectations for the program.

Consequently, the program must grow with the needs. It is essential that the various elements of the program be pushed simultaneously; these are:

- * Production of foundation seed
- * Certification Service
- * Infrastructure for Processing
- * Development of Seed Producers and Seed Enterprises

Unfortunately, entering into summer 1981-82, there is a shortage of field personnel for implementation of certification services. This factor seriously weakens the whole seed program. There are fields of soybean,

corn and rice seeds in Santa Cruz to be harvested in April and May which need supervision to reach a quality high enough for certification. The limited personnel of MACA does not provide enough capacity to perform this job in addition to operations of the Warnes plant. We hope for prompt action on the plan for the creation of a departmental seed certification service prepared by Chemonics. We recommend that USAID support this effort with financing for a certification laboratory, vehicles, and other needs. Other necessary actions in the short-run relate to operations of the processing plant in Warnes. A full-time mechanic devoted to the machinery in the plant is required. Also, more flexibility in administration of the plant to carry out small acquisitions, to hire laborers, and to expand working hours in the plant are required. These changes imply more authority at local level on the part of MACA's technicians.

The assistance of an expert from Mississippi is required for development of the final plan for the plant in Warnes, to design CIAT's plant for processing foundation seed, and to design a plant which should be constructed in the Chaco.

On planning of the national seed program, we recommend a meeting among the program evaluation team, and that the ideas and guidelines described in Chemonics' report must be given consideration. It is recommended that producer associations and other groups such as cooperatives be included in this effort to establish a final plan. Finally, we suggest that the terms of reference for the Seed Specialist included in the MACA/Chemonics Contract be reviewed and modified according to the needs of the program. These modifications should reflect the coordination effected by the Advisor among MACA, ANAPO, CIAT, and other institutions involved in the program.

B. Maintenance of Heavy Equipment and Agricultural Machinery

1. Background and Objectives

At the beginning of the semester, meetings were initiated between CODETAR and the Gran Chaco Cooperative to establish a joint system of equipment maintenance. Many factors related to orientation and organization of the program required better definition, among them: the establishment of a system of work based on control from the central shop; the role of the shop in provision of services to farmers and other private companies in the area; technical personnel required for the program; methods to be utilized in training; and the technical level required on the part of CODETAR personnel, and others. Therefore, an important objective for Chemonics was to coordinate among the institutions involved and to orientate CODETAR on the alternatives of organizing and operating the maintenance program.

Chemonics was carrying out the acquisition of tools and equipment to complete installation in the shop, and the goal for this semester was to deliver the equipment placed in the Santa Cruz customs. Related to this activity, the new equipment was to be installed in the shop.

Another objective related to heavy equipment maintenance was to inspect the Caterpillar tractors at the end of the land clearing season and to take steps to rehabilitate them for next season. This work includes repair of tracks: bushings, chains, segments, rollers, and idlers.

Finally, once a working relation was established between CODETAR and the Gran Chaco Cooperative, the objective was to bring another adviser in maintenance of agricultural machinery, who would be responsible for the coordination of field maintenance and would place emphasis in training of CODETAR personnel, personnel of the Cooperative, and of other institutions related with the program. Establishment of three field maintenance teams was desired: one team of mechanics to be in charge of CODETAR's machinery, another team to be in charge of Cooperative's and another team of specialized personnel to carry out monthly inspections and lubrication for both institutions. The latter would need a truck, lubrication compressor and electric welder with a gas engine.

2. Progress

Achievements are presented for this technical area in four parts. The first underlines activities related to acquisition of tools; then follows a section on installation of the shop. Third, general progress is presented in the maintenance program, including organization of the system of operation. The last part describes training activities.

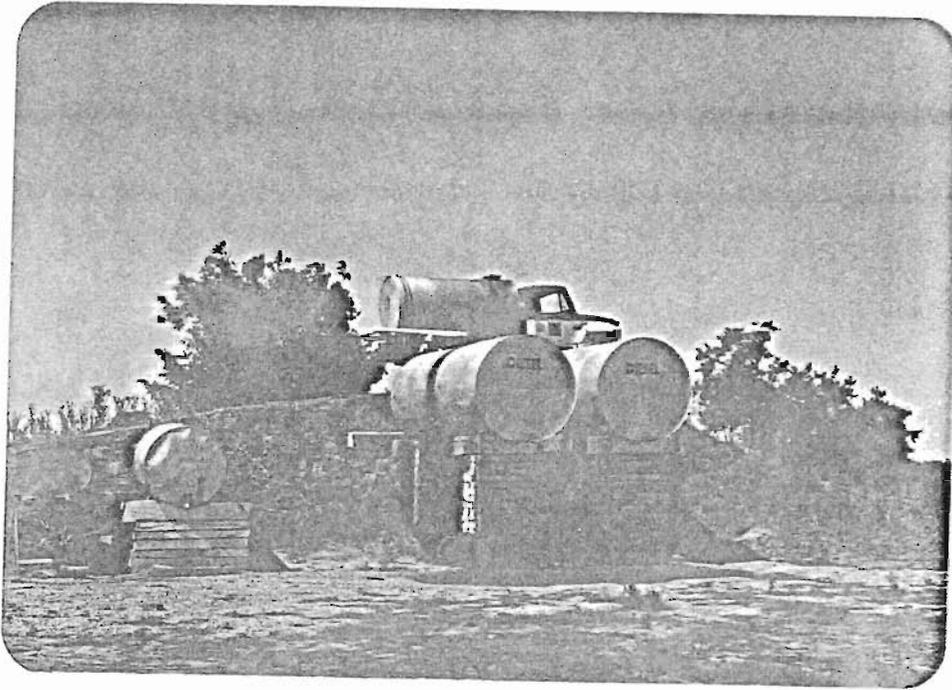
a. Acquisition of Equipment and Tools

Shipment of most of the equipment for the shop arrived in Santa Cruz in September. Chemonics assisted MACA in coordinating the reception so that all documents and formalities were in order before arrival of the equipment, and it was withdrawn from customs and sent to Palmar Chico in less than 48 hours. Chemonics' Administrator, Mr. Corsino Baptista, presented the necessary documents and personally accompanied the cargo to the shop. MACA is in charge of the official delivery to CODETAR.

Chemonics' Adviser, Mr. Les Pios, informed that wear of chains and bushings had advanced more rapidly than expected, which was due to very sandy and rough soils in the Chaco. To repair the chains, a track press is required, which was not included initially in the acquisition because of its high cost. Previously it was thought that would be more advisable to send the chains to Santa Cruz or Salta, Argentina to have them repaired. However, CODETAR expressed the desire to have its own equipment to perform this work in the Chaco. Chemonics' adviser and his counterparts of CODETAR inspected a track press in Argentina with the intention of buying it, but it also turned out to be very expensive. Luckily, Chemonics/Washington, with the guidance of our Yacuiba Adviser was able to identify a press suitable for D-7 Caterpillars at a lower price, and it was included in the acquisition. For this reason, a new extension of the letter of commitment was requested from USAID through the Coordination Office of the Project.

b. Installation of the Shop

To insure proper utilization of the new tools, Chemonics' Adviser in Heavy Equipment recommended that CODETAR prepare a contract of sale



Filling diesel tanks at Palmar Chico with the International truck of CODETAR, November 1981.



Field cistern to supply diesel to tractors, Palmar Chico November 1981.

with the mechanics and deduct a small amount each month from their salaries. The advantage of this system is that the mechanic himself becomes owner of the tools he utilizes, and therefore he takes good care of them. At CODETAR's request, Chemonics Chief of Party proposed this system to USAID and MACA. Later, recommendations were prepared for CODETAR which would have the effect of insuring that the tools would be utilized for the Project over a long period, and that the funds recovered would be used within the Project. The total cost for each set was estimated at \$us 1,054, including the initial price in the United States plus transportation costs. An alternate system would be to require that mechanics deposit around \$b 5,000 to 10,000 before receiving the tools. At the end of each month, an inventory would be done, and the price of any missing tools would be discounted from the deposit. The first system is more positive for the mechanics and requires less control. However, up to the end of the semester, CODETAR had not expressed its preferences about this.

Within the shop metal work tables were constructed and the valve grinder/head refacer was installed. The electrical installation was completed within the shop, but some extensions to the washing and lubricating equipment are pending, along with street lighting. Until the end of the semester, the transformer to connect to the Setar system was not installed, and therefore, electric current is only available when the emergency generator is operating.

The spare parts warehouse was organized and is functioning at present. A list of existing spare parts was prepared to begin a better system of inventory control. For each machine (i.e. tractor, vehicle, harvester, plow, or other) a jacket file is maintained which shows the new parts utilized. The spare parts inventory is still very small, however the current warehouse is almost completely full. More space will be needed to warehouse parts in the future, and a full-time warehouseman will be required.

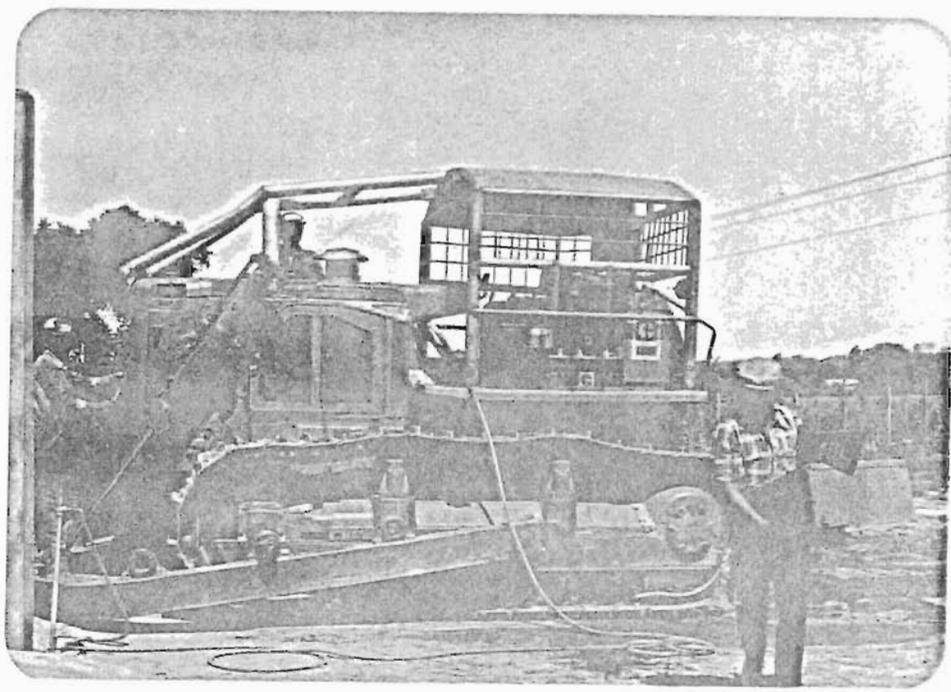
An electric welder was installed which was purchased by CODETAR to help in repair of rollers and idlers. Still a well-bed lathe is needed which has the capacity to turn the rollers after being welded. The Heavy Equipment Adviser supported CODETAR in finding an adequate lathe for this work. This acquisition had not been completed until the end of the semester.

c. Maintenance Program

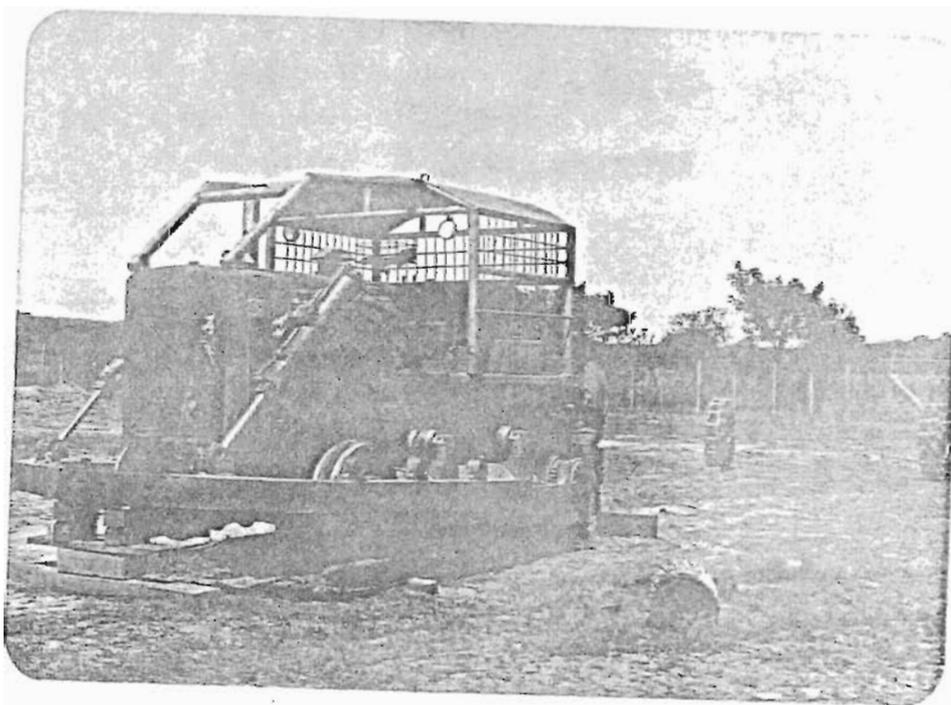
In September of this year, heavy repair of Caterpillars was begun with change of tracks in one of the tractors. Two sets of tracks available in the warehouse were used. These had been purchased earlier by USAID. Change of worn segments in the tracks of various tractors was also initiated. It was evident that deterioration of tracks had advanced more rapidly than expected in almost all tractors. Therefore, four tractors were shut down in November, and CODETAR sent the tracks to Santa Cruz to be repaired. Rollers and idlers were welded in the shop to put them in condition for next year. The engine of one of the International support trucks went out. Chemonics purchased new pistons and cylinder heads, and an engine overhaul was done in the shop. Also a complete repair of the Santa Matilde harvester was performed. This machine was totally ruined after one year of use in fields with heavy trash in the area of Villamontes.

The University of Tarija entered into an agreement with CODETAR to repair a series of used machinery, including heavy equipment. Two Caterpillar tractors and an additional engine were taken to the shop. Chemonics' Adviser together with a mechanic of the University inspected these machines and prepared parts lists and recommendations on repairs. The Gran Chaco Cooperative, farmers, and private companies have also asked for work to be done in the shop, so that the work load increased considerably during the months of October through December, compared with previous months.

A problem was encountered in the organization of CODETAR which made it impossible to provide the same services in the Villamontes area as is done in the Yacuiba area. This problem has its origin in the autonomy that was given to regional head of CODETAR in Villamontes. The attitude adopted by this person was that his area should have its own personnel and equipment for maintenance. Chemonics' advisers pointed out the difficulties that this situation creates for the program and explained the need to organize the maintenance program on the basis of the central shop. An agreement was reached by which CODETAR would change the system of organization with only one regional person responsible for the Gran Chaco Project. The shop and the



Caterpillar tractor just arriving from the field to receive maintenance service at the end of the land clearing season, Palmar Chico, November 1981.



D7G tractor after removal of tracks for repair, rolled chains can be seen at the background, Palmar Chico, November 1981.

maintenance program will be under the responsibility of this person, and will operate in the same way in both the Yacuiba and Villamontes areas. However, the corresponding actions were not taken during the semester.

The Adviser in Machinery Maintenance, Mr. Terrence McCarthy, arrived in Yacuiba in October to establish a system of field maintenance. For that purpose, personnel, a truck and equipment for lubrication and welding were required. Unfortunately, none of these elements were available due to the problem mentioned in previous paragraph. In spite of Chemonics' efforts, it was not possible to bring the equipment from Villamontes to initiate the system of field maintenance. Also the Adviser encountered difficulties in traveling in the area due to lack of an identification card. This card had to be obtained in La Paz. For these reasons, most of the time of this Adviser has been spent in the shop in Palmar Chico.

Mr. McCarthy has a secondary responsibility of providing assistance to the Integral Cooperative, specially in training of personnel. At the request of USAID and ONCICOOP, a trip was made to Cochabamba to help in the reception of 16 agricultural tractors on the part of ONCICOOP. Several mechanical problems were found which were pointed out when the tractors were received.

d. Training

The two advisers in the maintenance program work with their technical counterparts daily in organizing the program and in practices regarding maintenance and repair. Mr. Freddy Rojas, head of the tool room, has accepted increasing responsibilities in coordinating with the Regional Head in Yacuiba in matters regarding acquisition of materials and spare parts, and other support required by the program. On-the-job training has more impact for mechanics who must apply in practice the knowledge obtained. However, there are also needs for special courses in more advanced areas and the concepts of maintenance systems. The Adviser in Maintenance gave a small course lasting one week to twelve operators of the Cooperative covering aspects of preventive maintenance. Until now, it has not been possible to carry out this sort of training with personnel of CODETAR.

Based on the need for increasing training activities, Chemonics' advisers developed a plan for on-the-job training of eight mechanics for the period of one year. The plan includes all principal aspects of operation of the central shop and the warehouse, in addition to the practices and concepts of field maintenance. The plan was delivered to CODETAR for consideration.

3. Summary and Suggestions

Most of the objectives related to installation of the shop have been achieved. This has been only the initial stage of the program, and therefore the objectives are directed more and more to the operation phase of the maintenance system. The difficulties associated with implementation of the maintenance program and training make clear the effects of several factors related to organization which have damaged our progress during this semester. A complete maintenance system has not yet been established.

For this purpose, decisions are required on the part of CODETAR and USAID regarding following aspects:

- * The system of organization on the part of CODETAR regarding the Gran Chaco Project should be clarified. We recommend the establishment of a system where there is only one head of the Project in the Chaco and that the maintenance program be coordinated through this person.
- * CODETAR should place a truck, welding equipment and lubrication equipment at the disposal of the Adviser responsible for the field maintenance system.
- * Field mechanics currently working in Villamontes should be incorporated into the maintenance program. The work of all personnel in the program should be coordinated with the shop and central warehouses.
- * For the shop, a warehouseman and a shop foreman must be trained and special training should be organized for mechanics.
- * We recommend that USAID approve training program prepared by the

advisers and approved by CODETAR. This action will help in increasing the number of mechanics available for employment in the area.

- * CODETAR should reach a decision regarding control of tools to allow increased use of same.
- * The Integral Cooperative should be incorporated into the program once the system of field maintenance is operating.
- * We recommend that CODETAR and the Cooperative coordinate with the advisers in identifying and carrying out training programs for mechanics and operators.

C. Soil Conservation

1. Background and Objectives

Preliminary terms of reference had been prepared for the soil conservation adviser in collaboration with the Regional Head of IBTA in the Chaco, Eng. Jorge Aldunate. Then, terms of reference were reviewed by the National Director and the Technical Committee of IBTA in La Paz. The principal objective for the semester July through December was to recruit the adviser and to begin formation of the soil conservation program.

2. Progress

Due to limitations of grant funds, MACA, Chemonics, and USAID entered into an agreement to use funds from T-059 loan to create a new long-term position related in soil conservation. Amendment number seven to the Contract between MACA and Chemonics was approved in November, and Chemonics presented curriculums of the candidates to MACA. Authorities of MACA and IBTA selected Dr. E. Don Hansen, who was employed by Chemonics during the first days of December. After a brief orientation in the offices of Chemonics in Washington, D.C., Dr. Hansen arrived in Bolivia the 6th of December. In coordination with IBTA, CODETAR, the Integral Cooperative and farmers in the Yacuiba area, the Adviser made a series of visits to the different places

in the valley. The purpose was to survey the types of soils, ecological conditions and the acceptance on the part of farmers to carry out projects and adopt new practices to control erosion. In his December report the Adviser informed of gulleys of 15 cms. up to more than two meters which are being formed in agricultural lands and also in access roads. Several necessary practices which must be implemented in the short and long-run were determined. A zone was identified to implement demonstration projects to give impulse to the program. Then the Adviser, jointly with Chemonics' Chief of Party, made a series of visits to institutions in La Paz with the purpose of obtaining support and materials necessary for the program. Together with the National Director of IBTA, Eng. Francisco Pereira, it was agreed that two technicians of IBTA in Yacuiba will be assigned as full time counterparts to the Adviser. In collaboration with the Director General of MACA, and the National Head of Soils, a list of the equipment needed for the program was prepared. Part of the equipment is available in MACA and part must be purchased. Afterwards visits were made to the ERTS Program and to the National Institute of Air Photography with the object of determining the availability of images and information about the work area.

3. Summary and Suggestions

The main objective of initiating the soil conservation program was achieved, and thanks to the interest and cooperation on the part of the authorities, technicians, and farmers, field work level has started. We recommend that MACA and IBTA provide necessary support to technicians in the area so that they can carry out their work with a minimum of limitation. We recommend that authorities of the Agricultural Bank of Bolivia provide support to the program by means of granting medium-term loans for construction of projects to control the erosion. Finally, we hope that MACA and USAID will approve the use of loan funds to purchase field equipment needed by two work teams in the area, including satellite images and/or air photos which will be required.

SECTION III

PROGRESS IN INSTITUTIONAL STRENGTHENING

SECTION III

PROGRESS IN INSTITUTIONAL STRENGTHENING

A. Sector Planning

1. Background and Objectives

Chemonics had earlier prepared a model of linear programming in collaboration with the Direction of Planning of MACA. The reports presented by Dr. David Zimet, short-term adviser of Chemonics, contained the theoretical basis of the model, the explanation of the demand and transportation components, and a set of recommendations with regard to applications. However, the model was not run on computer due to delays in obtaining statistical information regarding quantities of land in each zone. Therefore, the objective for this semester was to prepare a report demonstrating the results and usefulness of the model, once the outputs of the computer are received.

In another area, the DPS of MACA identified a need to study and improve the national information system for the agricultural sector. To carry both programs mentioned above, MACA requested that Chemonics contract a short-term adviser in sector planning for the initial period of three months. The terms of reference of the adviser included the following activities:

- * Review the results of the linear programming model and prepare a report including suggestions about possible applications.
- * Suggest ways to expand and improve the information in the model, and assist in compiling that information.
- * Evaluate the National System of Agricultural Information, identify information needs and the methodology to obtain it.
- * Define the responsibilities of the institutions involved with the intention of forming an agricultural research department.

2. Progress

To develop these activities, Dr. Luis Ampuero Ramos was contracted on October 1st, and with the support of Chemonics' Chief of Party, he carried out the tasks described as follows:

a. Linear Programming Model

The structure of the model and method of running it on computer were reviewed; then the results of the first run were analyzed. A coding error which was repeated several times in one section of the model was identified. Therefore, Chemonics/Washington ran the model again with the corrections. Specific instructions were used to obtain a "picture" of the matrix structure and a listing of all the information utilized. On the basis of these results the model was again analyzed and minor coding errors were identified. Minor modifications were made for the final run, again done in the United States. The results were ready to be sent to Bolivia at the end of the semester.

Meanwhile, a search for bibliographic references relevant to spatial equilibrium models was performed through the office of Chemonics in Washington. Most of the report was prepared, which consists of the following sections: analysis of the role of linear programming in sector planning; general treatment of spatial equilibrium models, explanation of MPSX computing code for problems of linear programming; and the interpretation of results of the model. This report is complementary to that of Dr. Zimet.

The last section will be completed on the basis of results of the model, which are expected to be received soon. Also contact was maintained with the DPS in order that the technicians responsible for the part of the model related to production activities prepare a brief description of the methodology utilized. However, due to the lack of personnel in this office, this task has not been completed.

b. The National System of Agricultural Information

The work plan for this technical area was prepared with personnel of the DPS. According to the plan, the first task was to prepare a survey for the executives and technicians of the sector on their needs for information and their activities in compilation, interpretation and publishing. A questionnaire was tested with the Director of the DPS and one of the technicians who was assigned to help in carrying out the interviews. Unfortunately,

this collaboration was not forthcoming, and all the interviews were carried out by Chemonics' advisers. The institutions interviewed were the following: INFOL, INC, SNDC, ACLO, M. VIVADO Y ASOCIADOS, CDF, IDRA, PNDRI, BAB, IBTA, CIAT, CORDECRUZ, CAO, FEGASACRUZ, ADEPLE, ANAPO, CORDECH, DESEC, and COINCA.

In this field a bibliographic search was also made by computer in the United States, and references existing in Chemonics/La Paz and in MACA's Library were reviewed. Around 20 documents of great value for the study were obtained.

3. Summary and Suggestions

The objectives related to the report on the linear programming model have been fulfilled almost in their entirety. Only a few days of work are required to complete the report. Regarding the Information System, it was possible to complete the study due to the amount of time taken by the Adviser in conducting interviews. As mentioned in the introduction of this report, objectives are formulated under the assumption that the advisers perform their work jointly with technicians of the institution responsible on the part of the Bolivian government. This same point of view prevailed at the moment the work plan was developed in coordination with the DPS. However, as pointed out above, the technicians of the DPS are overburdened with other tasks, which in many cases are not related to planning. In view of this situation, Chemonics submitted a progress report to MACA officials related to the National Information System. MACA authorized the extension of Dr. Ampuero's contract for a period of six months to complete the study phase and to initiate the implementation of some of the recommended activities.

The preliminary conclusions of the study of the Information System point out the need to prepare an annotated bibliography of publications in the agricultural field of Bolivia, and to develop a statistical yearbook, both to improve the availability of information to the people who have need for it. We recommend that MACA and also IBTA provide human and budgetary resources to implement these, and other activities.

B. Organization and Methods

1. Background and Objectives

Work in this technical area was focused on the study of personnel of the agricultural public sector carried out by the Adviser in Organization and Methods, Lic. Robert Sparks, in cooperation with the Office of Administrative Analysis of MACA. At the beginning of the semester reports on SNDC, BAB and IBTA were prepared in draft. It was agreed with MACA that the O&M Adviser would remain in Bolivia until the 15th of July to complete the preparation of the reports corresponding to Central/MACA, INC and CNRA. Later, Chemonics' Chief of Party would be responsible for completing the series of reports of the twelve institutions studied and to prepare a general report covering all personnel of the sector.

During the period a meeting was held with the new Head of the Office of Administrative Analysis. However, this Office could not assign personnel to help with the mentioned study. Therefore, Chemonics continued working without counterparts in this technical area during the semester.

2. Progress

Before leaving the country, the Adviser in Organization and Methods completed in draft a report corresponding to Central/MACA and another for INC and CNRA combined. He also prepared tables and graphs for the remaining reports of the series; this task was done with the cooperation of an assistant, Lic. Gualberto Lizárraga.

The reports of SNDC, BAB, IBTA and Central/MACA were prepared in final during the months of August and September. However, computer outputs of INE were not adequate for presentation with the reports. This was due to the fact that the printer of INE does not have the necessary software to print correctly according to the signals of the FORTRAN language. Therefore, the magnetic tape containing the information was transferred to CENACO's computer, and with the cooperation of ERTS's programmers, copies of the results were again run in final. Then the titles were put on the printouts according to the code of each institution studied.

After submitting the four reports mentioned above, preparation of the general report on all personnel of the public agricultural sector was begun. Due to the fact this report focuses on the organization of the sector, it was desired to present the distribution of technical personnel by function: extension, credit, research, planning, infrastructure, protection of natural resources, land tenure, social services, and others. For this purpose it was necessary to return to the institutions to clarify part of the information related to the technical area of some positions. Chemonics' Chief of Party carried out some of these visits, but time was not sufficient to complete them before the end of the semester.

3. Summary and Suggestions

Only part of the objectives were fulfilled in this technical area, because the entire series of reports for the study of personnel was not completed within the semester. The previous progress report emphasized that the main value for MACA is not in the results of the study, but in the process of reaching results and the experience and training for the personnel in carrying out studies in the field of public administration. We suggest that MACA, and specifically the Office of Administrative Analysis, assign a full-time technician to work with Chemonics in the final stage of the study. In this way, MACA would be more able to make use of the information and of the efforts in analysis made up to date.

SECTION IV

PROGRESS IN PROJECT COORDINATION AND ADMINISTRATION

SECTION IV

PROGRESS IN PROJECT COORDINATION AND ADMINISTRATION

A. Background and Objectives

Coordination of the efforts of advisers with client institutions and other program support activities are reported in this section. These activities are the main responsibility of Chemonics' Chief of Party in Bolivia, backed by the Project Supervisor, Ms. Candace Conrad, in Washington, D.C.

Regarding field activities, an objective was to support the Seed Specialist in developing a plan for the formation of a certification service in the Department of Santa Cruz. During the semester the need arose to participate in formulation of guidelines for planning of the seed program at the national level. Additionally, there was the desire to help in preparing a training program for personnel of the Seed Department and obtain funds from USAID. Finally, an objective was to purchase additional screens for the processing plant in Warnes.

In the area of heavy equipment and agricultural machinery maintenance the main objective had been to finalize the agreement between CODETAR and the Integral Cooperative and to recruit an adviser who would be in charge of the field maintenance system. Another desire was to help CODETAR in looking for a way of organization which would permit the efficient implementation of the Gran Chaco program. In another area, an objective was to complete the purchase of equipment and tools for the Palmar Chico shop. Also it was wished to coordinate with CODETAR in the formulation of a training program for apprentice mechanics in the Chaco.

As for the work in soil conservation, the main objective was to collaborate with the institutions involved in the Chaco in defining terms of reference for an expert, to obtain approval and funds to employ him, and to help in initiation of the program with the new adviser.

Regarding efforts in institutional strengthening, the goals were to complete the series of reports in the area of organization and methods, and

also the report on the model of linear programming. This was to be carried out with the help of a short-term adviser. However, MACA identified another need in the development of the national system of agricultural information. The objective was to obtain the services of a short-term adviser and to assist in the study of problems related with information and to help in preparing the report on this subject.

Another task for the semester was to prepare amendments seven and eight to the Contract between MACA and Chemonics which would permit the employment of advisers in machinery maintenance and in soil conservation, and also allow the continuation of Chemonics' work until November 1982. It was necessary to prepare two new budgets corresponding to each amendment.

In the field of administration, an objective was to better organize the use of office space in the La Paz central office. Then, there were series of activities related with the employment of the new advisers, for example: renting of residences, furniture shipments, visas, identification cards, plates for private vehicles, transport of personal effects, and others. Related to reduction in the number of advisers in La Paz and the increase in Yacuiba, a readjustment in the distribution of support personnel was desired. In addition, a suite for additional social benefits was presented, and therefore, an objective was to represent the firm in Court. Finally, it was intended to help the Coordination Office of MACA in obtaining clarification from the Ministry of Finance about the payment of AADA services for goods imported under the Project.

B. Progress in Coordination of Technical Areas

1. Seed Improvement

Support was given to the Adviser in this field in the preparation of a winter training program for personnel of MACA. MACA and USAID approved funds and the four trainees stayed for two months in Santa Cruz. Chemonics' Chief of Party visited them the last day of training to exchange ideas and impressions about the program.

Help was provided in preparing a plan for the formation of the certifi-

cation service in Santa Cruz. Unfortunately, problems of initial financing to implement this project have not been overcome. At the request of the Director General of MACA, assistance was provided in formulating the guidelines for planning of the seed program at the national level. This work involved travelling to Santa Cruz, Yacuiha and Cochabamba. The report on this subject was completed in December to be distributed among participants in the evaluation of the program.

Finally, help was provided in coordinating the acquisition of screens for the plant in Warnes.

2. Maintenance of Heavy Equipment and Agricultural Machinery

Two trips to the Chaco were made during the semester to help CODETAR and the Integral Cooperative in formulating an agreement which sets the basis for operating the maintenance program. Later, the terms of reference for a new expert in agricultural machinery maintenance were prepared. However, limitations arose in terms of funding to employ long-term advisers. Chemonics presented a series of alternatives to MACA to overcome these problems. Later MACA and Chemonics entered into an agreement by which the consulting company accepted a financial risk in the event that additional funds were not approved. This agreement is reflected in amendment number seven to the Contract.

Upon arrival of the adviser, needs for equipment and personnel to initiate the program of field maintenance were discussed with CODETAR and the Integral Cooperative. However, the necessary elements were not obtained by the end of the semester.

A trip to Tarija was made to make officials of CODETAR aware of the difficulties imposed on the maintenance program due to the form of organization adopted by this institution. Unfortunately, the problems continued until the end of the year.

Chemonics shipped most of the equipment and tools from the United States and reception of them coordinated. Chemonics' Administrator made the customs dispatch in Santa Cruz and coordinated the shipment to Palmar

Chico. Several emergency purchases for CODETAR were also carried out.

The training program for eight apprentice mechanics was prepared and given to CODETAR.

3. Soil Conservation

In coordination with MACA and IBTA, terms of reference for assistance in this field were prepared. Again the problems due to limitations in funding arose. Due to the high priority that MACA assigns to this technical area, the use of loan funds for a long-term adviser was approved. The corresponding budget was prepared, and the terms of reference were included in amendment number seven.

Chemonics recruited two high qualified candidates for this position, and curriculums were presented to MACA. The adviser arrived in Bolivia in December, and Chemonics' Chief of Party helped in coordinating with the institutions involved with the Chaco and with natural resources at national level.

4. Sector Planning

Dr. Luis Ampuero Ramos was contracted as short-term adviser to analyze the results of the model of linear programming and to study the problems of the National System of Agricultural Information. An orientation was provided to the adviser regarding the construction of the LP model, and help was provided to identify errors in the original matrix. Later, the model was channelled through Chemonics/Washington to obtain two more computer runs. Chemonics/Washington also carried out two bibliographic searches for references, and part of the desired information was obtained. Regarding the study of problems of agricultural information, Chemonics' Chief of Party assisted in preparing the questionnaire and in interviewing some institutions. He helped arrange dates for interviews in the Department of Santa Cruz.

5. Organization and Methods

Four reports of a series on the study of personnel were prepared, which were distributed among interested people. Output tables were again obtained in final from the computer and titles specific to each institution were typewritten. Later, tabulations were begun for the report covering personnel of all institutions as a whole.

6. Project Administration

Chemonics' Administrator, Mr. Corsino Baptista Leyes, collaborated extensively in all stages to the new advisers who began their work in Bolivia during the semester. Residences of Messrs. McCarthy and Hansen were rented and furnished. Two air-conditioning units were purchased in the United States for one of the houses. Visas, identification cards and other document requirements are specially difficult for Yacuiba advisers. Mr. McCarthy encountered serious problems in moving around the work area because of not having an identification card, which has to be obtained in La Paz. These formalities imply additional expenses for the Contract and delays in initiating the work.

Due to reduction of foreign long-term personnel in La Paz, support personnel was also reduced in Chemonics office, and a driver was employed for the office in Yacuiba. The new driver will work principally in support of Dr. Don Hansen in the soil conservation program.

A series of importation policies were followed up; these were pending in the Ministry of Finance, customs agencies, and other offices, in some cases for more than a year. Also, the necessary steps were taken through the Ministry of Finance for the sale of a private vehicle. Additionally in support of MACA, formalities were channelled between MACA and the Ministry of Finance to exempt the 0.5 percent collected by AADA on goods and materials imported for the Project.

A lawyer was contracted to represent the Company against a suite for social benefits in addition to those that are paid by the firm according to law. The required information was provided to be presented in Court.

Finally, office space in La Paz was reorganized to reduce noise interference among employees, a factor which affects work efficiency.

C. Summary and Suggestions

Most of the objectives in coordination of technical work and in project administration have been achieved. Among the main tasks that remained pending for next semester are:

- * Establish the methods to be used in the training program for mechanics in the Chaco.
- * Initiate a complete system of field maintenance for CODETAR and the Integral Cooperative.
- * Complete the final report of the linear programming model.
- * Write a report on the reorganization of MACA based on information from the study of personnel of the sector.

Due to the increasing efficiency of Chemonics' team of local employees, it was possible for the Chief of Party in Bolivia to use most of his time in coordinating and supporting the technical programs. During the semester July through December 1981, almost 73 percent of the time was devoted to technical activities, compared to 62 percent in the first semester of 1981 and only 40 percent previously.

It is worth mentioning that during the semester improvements in project coordination were perceived on the part of the institution which is the leader of the sector, MACA. Through direct contacts with the Seed Department, IBTA, CODETAR, Soils Department, USAID, Chemonics and others, the Office of the Director General has been kept informed and has taken concrete actions to improve the programs. The Direction of Sector Planning, jointly with USAID, carried out an evaluation which will improve various aspects of the Project related to programming of funds, and implementation. Finally, the Coordination Office of the Project is supporting in administrative aspects. In the previous progress report of Chemonics, it was recommended that the role of the mentioned offices be better defined in order to avoid duplicity of efforts. We feel that during this semester each office has

adopted the most appropriate role.

We recommend that MACA formalize the above mentioned structure, and that the role of each participant in the Project be defined. This action would help officials and technicians of CODETAR, IBTA, and others active in the Project.

Finally, it is urgent that personnel of the Direction General, the Direction of Planning and the Coordination Office have direct knowledge of activities in the field. We recommend that MACA provide the necessary budget so that officials of MACA can travel to the field to coordinate the Project.

SECTION V

SUMMARY OF RECOMMENDATIONS

SECTION V

SUMMARY OF RECOMMENDATIONS

In this section the more important recommendations outlined in various parts of the report are reiterated. The next section presents the objectives for the first semester of 1982.

Regarding the seed program the most urgent need is the formation of the certification service for the Department of Santa Cruz. The lack of personnel for field inspections and laboratory control is already a limiting factor in summer of 1981-82, and will be critical for the winter 1982 program. Second, we recommend that an expert in engineering of processing plants be brought to Bolivia to complete the design for Warnes, CIAT/Saavedra, and for a plant in the Chaco. We hope that USAID will allocate funds for these installations in the reprogramming of the T-059 loan. However, this recommendation has value only if Bolivian institutions devote the personnel and budget necessary for certification services. Third, we suggest that MACA obtain funds necessary for another winter training for personnel of the Seed Department. In this way, personnel is better utilized during the winter, new capabilities are gained and better use is made of the time of Chemonics' Adviser. Fourth, it is urgent that MACA provide a mechanic to the plant in Warnes, and that more flexibility be given to local administration. Fifth, we recommend that the evaluation group of the seed program establish strategies for the implementation of the program.

With reference to the Gran Chaco program, we hope that equipment and personnel become available as soon as possible to initiate the system of field maintenance. We recommend that CODETAR assign only one head of the Gran Chaco Project, an action considered necessary for implementation of the maintenance system. We recommend that USAID approve funds for training of mechanics in the area. Finally, we suggest that the Integral Cooperative utilize to the maximum the maintenance services offered by CODETAR.

For the soil conservation program, we suggest that the interested ins-

tutions proceed with the support that has been offered. We recommend that USAID make funds available for a modest quantity of field equipment and for aerial photos. We hope that BAB officials will provide credit for erosion control projects.

In the area of planning, we recommend that the Direction of Planning, the Statistics Division of MACA, and the Communications Unit of IBTA devote personnel and other necessary resources to prepare a statistical yearbook and an annotated bibliography. These would constitute only the first steps to improve the system of agricultural information in the country.

We recommend that MACA's Office of Administrative Analysis assign a full-time technician for the period of three months to assist in the final phase of the study of personnel. In this way, this Office would be better prepared to utilize the results of the study.

Finally, we recommend that MACA clarify the functions of the officials who have responsibility in project coordination. We suggest that technical decisions remain at the level of the Direction General, that the Coordination Office take responsibility for financial administration of the Project; and that Direction of Planning continue in the role of evaluator.

SECTION VI

CONCLUSIONS AND FORECAST

SECTION VI
CONCLUSIONS AND FORECAST

As mentioned in Chemonics' previous report, the principal factor that limits the effectiveness of work performed by advisers is due to lack of counterpart personnel on the part of the institutions executing the programs. The economic problems currently encountered in Bolivia are causing these problems to become more acute. The seed program lacks personnel to implement the certification service. A mechanic is needed in the Warnes processing plant for maintenance of machinery, and workers are needed for handling of seed in bags. Work in sector planning and organization and methods has largely been carried out without the participation of MACA counterparts. Personnel existing in each program is poorly motivated due to a very low salaries, and to the lack of resources to carry out work. Officials with responsibilities in project administration and coordination have not been able to travel to the work areas in the field.

We hope that these limitations will be partially overcome during the first semester of 1982 in various programs. Otherwise, it will not be possible to achieve the objectives presented below.

On the seed program we hope that the problems of initiating the seed certification service will be overcome, and that USAID approves financing for the laboratory, vehicles and office equipment. Chemonics is willing to support MACA in obtaining laboratory equipment and to install it. Additionally, Chemonics' objectives are to support MACA, CIAT, ANAPO, and PROMASOR in organizing activities of the certification service and in training personnel in specific field activities. We hope MACA will approve the visit of an expert from Mississippi State University to proceed with revision of the designs of processing plants in Warnes and the Chaco, and also preparation of a design for a foundation seed plant for CIAT in Saavedra. This expert would come under an agreement between MSU and AID/Washington, without cost to Bolivia. We hope that USAID approves funds for construction, equipment and installations. Chemonics' objectives for the next semester are

to help in designing these plants and to help MACA and CIAT in supervising construction and installation possible with currently available resources. As for seed activities in the Chaco, the objective is to encourage the involvement of farmers of the area in the production of high quality seed through MACA and IBTA. Finally, in this field, we wish to participate more closely with the Seed National Director and the Direction of Planning to define the strategies to guide the activities at national level.

Regarding the land clearing program in the Chaco, we hope that the equipment and personnel are available to begin the program of field maintenance. We also hope that the Integral Cooperative will become involved in the program. Chemonics' objectives are to complete the final phase of the shop installation, and to complete repairs of the eight Caterpillar tractors for the next land clearing season. Specifically, this objective involves the installation of the track press and training of personnel in all phases of track repair. Later, we wish to initiate a system of field maintenance, mobilizing two field mechanics and special lubricating and welding equipment. One of the field mechanics would be from CODETAR and the other from the Integral Cooperative. The special lubrication equipment would serve machinery of both institutions in all aspects related to monthly inspections and maintenance. Finally, we hope to provide support to CODETAR and the Cooperative in planning of their needs for equipment and parts and other aspects of organization of their programs.

Referring to the soil conservation program, the first objective is to continue with field visits to survey the resources of the area, assess the extent of erosion problems, and formulate recommendations on land use, farm practices and erosion control projects. We intend to organize a field team to draw up plans of fields and design special facilities. Another objective is to build erosion control projects in an accessible site to facilitate visits of farmers of the area. Finally, there is a need to formulate recommendations on aspects of local organization which would encourage cooperation between farmers and officials to implement erosion control projects for entire basins.

Referring to work in organization and methods, the principal objective is to prepare the report on reorganization of the sector based on the information of the personnel study. We also wish to complete the series of specific studies on each institution studied.

Regarding the linear programming model, the final report will be completed once the results of the last run of the model are received from Chemonics/Washington. In addition, the study of the National System of Agricultural Information will be completed and a report presenting results will be prepared, including specific recommendations of activities to be implemented in the short-run. Finally, cooperation will be provided to the DPS, the Statistics Division of MACA and the Communications Unit of IBTA in implementing the recommendations. At the same time, contact will continue with the Ministry of Planning and Coordination to formulate long-run plans regarding the System.