UNCLASSIFIED

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

PARAGUAY

PROJECT PAPER

SMALL FARM TECHNOLOGY

AID/LAC/P-015

Project Number 526-0109

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE: [A] (A = ADD, C = CHANGE, D = DELETE)

PP

2. DOCUMENT CODE: 3

3. COUNTRY/ENTITY: Paraguay

4. DOCUMENT REVISION NUMBER:

5. PROJECT NUMBER (7 digits): 526-0109

6. BUREAU/OFFICE: A. SYMBOL: LA; B. CODE: 05

7. PROJECT TITLE (Maximum 40 characters): Small Farm Technology

8. ESTIMATED FY OF PROJECT COMPLETION: FY 83

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 79; B. QUARTER 4 (Enter 1, 2, 3, or 4); C. FINAL FY 79

10. ESTIMATED COSTS ($000 OR EQUIVALENT $1 = G126)

A. FUNDING SOURCE	FIRST FY B. FX	FIRST FY C. L/C	FIRST FY D. TOTAL	LIFE OF PROJECT E. FX	LIFE OF PROJECT F. L/C	LIFE OF PROJECT G. TOTAL
AID APPROPRIATED TOTAL	3,465	2,035	5,500	3,965	2,035	6,000
(GRANT)	(500)	( )	(500)	(1,000)	( )	(1,000)
(LOAN)	(2,965)	(2,035)	(5,000)	(2,965)	(2,035)	(5,000)
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY		3,657	3,657		3,657	3,657
OTHER DONOR(S)						
TOTALS	3,465	5,692	9,157	3,965	5,692	9,657

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY F. GRANT	E. 1ST FY G. LOAN	H. 2ND FY I. GRANT	H. 2ND FY J. LOAN	K. 3RD FY L. GRANT	K. 3RD FY M. LOAN
(1) FN	120	070	070	500	5,000	500			
(2)									
(3)									
(4)									
TOTALS				500	5,000	500			

A. APPROPRIATION	N. 4TH FY O. GRANT	N. 4TH FY P. LOAN	Q. 5TH FY R. GRANT	Q. 5TH FY S. LOAN	LIFE OF PROJECT T. GRANT	LIFE OF PROJECT U. LOAN
(1) FN					1,000	5,000
(2)						
(3)						
(4)						
TOTALS					1,000	5,000

12. IN-DEPTH EVALUATION SCHEDULED: MM 12 YY 79

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

[2] (1 = NO, 2 = YES)

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE

TITLE: Abe M. Peña
Director, USAID/Paraguay

DATE SIGNED: MM 05 DD 05 YY 78

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY

AID 1330-4 (3-76)

1 AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT IDENTIFICATION DOCUMENT FACESHEET

TO BE COMPLETED BY ORIGINATING OFFICE

1. TRANSACTION CODE: [A] (A = ADD, C = CHANGE, D = DELETE)

PID

2. DOCUMENT CODE: 1

3. COUNTRY/ENTITY: PARAGUAY

4. DOCUMENT REVISION NUMBER:

5. PROJECT NUMBER (7 DIGITS): 526-0109

6. BUREAU/OFFICE: A. SYMBOL: LA; B. CODE: 05

7. PROJECT TITLE (MAXIMUM 40 CHARACTERS): SMALL FARMER SECTOR PROGRAM

8. PROPOSED NEXT DOCUMENT

A. [2] (2 = PRP, 3 = PP) B. DATE: MM 10 YY 76

9. ESTIMATED FY OF AUTHORIZATION/OBLIGATION

a. INITIAL FY 78 b. FINAL FY 80

10. ESTIMATED COSTS ($000 OR EQUIVALENT, $1 = ₲126)

FUNDING SOURCE	LIFE OF PROJECT
A. AID APPROPRIATED	3,500
B. OTHER U.S. 1.	
B. OTHER U.S. 2.	
C. HOST COUNTRY	2,000
D. OTHER DONOR(S)	
TOTAL	5,500

11. PROPOSED BUDGET AID APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. FIRST FY ____ F. GRANT	E. FIRST FY ____ G. LOAN	LIFE OF PROJECT H. GRANT	LIFE OF PROJECT I. LOAN
(1) FN	180	050		210	3,100	400	3,100
(2)							
(3)							
(4)							
			TOTAL	210	3,100	400	3,100

12. SECONDARY TECHNICAL CODES (maximum six codes of three positions each)

011	012	080	019	053	

13. SPECIAL CONCERNS CODES (MAXIMUM SIX CODES OF FOUR POSITIONS EACH)

BF	R/AG	DEL	PART	TECH	INTR

14. SECONDARY PURPOSE CODE:

15. PROJECT GOAL (MAXIMUM 240 CHARACTERS)

To increase the income and employment of small scale farmers in Paraguay.

16. PROJECT PURPOSE (MAXIMUM 480 CHARACTERS)

To enable the Ministry of Agriculture to address the principal constraints-inadequate research, extension, intermediate technology and marketing services-which inhibit the small farmer from increasing his income and employment.

17. PLANNING RESOURCE REQUIREMENTS (staff/funds)

14 weeks of specialized assistance from AID/W; 38 weeks of contract assistance. Total cost of $56,550, to be funded by technical support.

18. ORIGINATING OFFICE CLEARANCE

Signature

Title

Date Signed MM DD YY

19. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION MM DD YY

AID 1330-2 (3-76)

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ANNEXES

UNATTACHED ANNEXES

II. PROJECT DESCRIPTION

A. Summary Description and Rationale

The productivity of small farm agriculture in Paraguay has been virtually stagnant in recent years. The productivity of Paraguayan agriculture, in general, is below the average for Latin America as a whole, and small farm productivity is below the national average. Increases in output in the sector as a whole, and particularly in the small farm subsector have been the result, principally, of increased use of basic resources in relatively constant proportions. Yields per hectare show no correlation with farm size. These facts demonstrate that the technology of small farm agriculture is stagnant. The objective of this project is to launch an attack on this technological constraint.

With the technology currently in use on small farms the limiting factor is labor. Farm households with holdings of more than three hectares are unable to cultivate the lands they have. Technologies which improve the productivity of labor will enable small farmers to utilize their available land more extensively and more efficiently.

This project proposes to disseminate improved technologies to about 50,000 small farmers in selected minifundia areas to increase yields and raise labor productivity. Coverage is generally expected to increase threefold from current levels of around 20% (including indirect or spread effects) to over 60% of farm population in the target regions.

These technologies will, with the cooperation of participating farmers, be field tested on small farms in the project area and will be analyzed and evaluated in the context of the whole farm operation. Mass media techniques will be used to disseminate the knowledge which small farmers determine to be adaptable to their production systems and conditions. The National Extension Service (SEAG) currently has 77 local field agencies, of which 31 are in the Project area. By the end of the Project, 43 of a projected 90 local field agencies of SEAG will have been incorporated in a regional center network structure.

To achieve these objectives the project will undertake a phased creation of local delivery networks consisting of 43 small farmer service units supported by seven strategically placed regional development centers of SEAG. The project will also support three activities that are independent of SEAG but directly related to its needs: (i) creation of a modest research capacity in the Ministry's National Agro-Mechanical School, to study and develop mechanical innovations specially suited to small farm needs; (ii) establishment of a revolving fund in the National Seed Service, SENASE, to pay for the costs of contract growing and related packaging and distribution of seeds appropriate for small farmer use; and (iii) support research efforts on non-traditional crops potentially suited to small farmer production.

The project represents the Mission's effort to break through the technological barrier which currently constrains the improvement of the income and welfare of small farmers. It will complement A.I.D. Rural Enterprises Loans I and II, which provide credit to manufacturers wishing to produce small farm machinery. It will also be coordinated with farm credit projects such as that of CREDICOOP, an A.I.D. Loan/Grant providing funds for the purchase of machinery, chemical and seed inputs for small farms.

The summary cost distribution shown below reflects the Project's financial administration. Thus, for example, training and technical assistance are shown as separate items even though they will be fully integrated with specific activities under the Project.

A.I.D. Loan	$ 5,000,000
1. SEAG:	
- Operating Costs (pilot research projects and farm management programs, travel, per diem, local supplies, etc.)	1,281.2
- Investment (vehicles, printing and communications equipment, office equipment and furniture)	1,622.3
2. Small Farm Machinery Development	319.1
3. Seed Production Revolving Fund	450.0
4. Research Operations	140.0
5. Training	442.4
6. Technical Assistance, Consultants and Specialists	261.0
7. Administration	72.8
8. Adjustment for Inflation	411.2
A.I.D. Grant	$ 1,000,000
Pre-Implementation Training	55.2
Resident Advisers (8 person years)	560.0
Short Term Consultants (141 person months)	270.0
Adjustment for Inflation	114.8

Host Country	3,657.2
Incremental Project Related Salaries	1,895.3
Incremental Operating Costs and Other	1,048.6
Adjustment for Inflation	713.3

B. Detailed Description

All planning, programming and technical and logistical support functions under SEAG's current structure are located in SEAG's Central Office in San Lorenzo. Under SEAG's highly centralized structure, field agents report to zonal chiefs, who have no staff and whose responsibility is limited to minor administrative details since they themselves are field agents.

The Project will assist SEAG to decentralize its operating structure by establishing seven regional rural development centers. The director of each center will be trained, provided with resources and staff, and delegated management and operational authority for carrying all Project activities in the area to be served by the center. The director will form a technology delivery network comprised of the personnel in the center and the local field agents in the farmer service area, and supported by services available under the Project from SEAG's Central Office and other sources.

Normally, from four to eight local field agencies will be attached to each center, depending upon the number of small farmers being serviced and the accessibility of the area being served. At the beginning, their location will be based on SEAG's prior experience. Later on, their exact location will depend on the program priorities developed by the regional team. Typically, the key professional team will be comprised of a team leader, an economist/farm management specialist, two or three agronomists, one or two animal production specialists, an entomologist, a nutrition/home improvement specialist, and a program planner/evaluator. The size and composition will be expected to change over time as small farmer needs and opportunities in the area being serviced become more clearly identified and alternatives worked out. SEAG's local agencies currently are programmed to operate with a staff of three: two agronomists (of which one may be a livestock specialist) and a home economist. For planning purposes, no change in this composition has been incorporated, although future refinements probably will be made as greater experience is obtained under the Project.

Figure I on the following page depicts the functional relationships of the elements of the local delivery network under the Project. It illustrates a team effort in its outreach to the small farmers as well as the supporting services expected from SEAG's central office. Figure II depicts the various linkages the decentralized Project structure will have.

FIGURE I

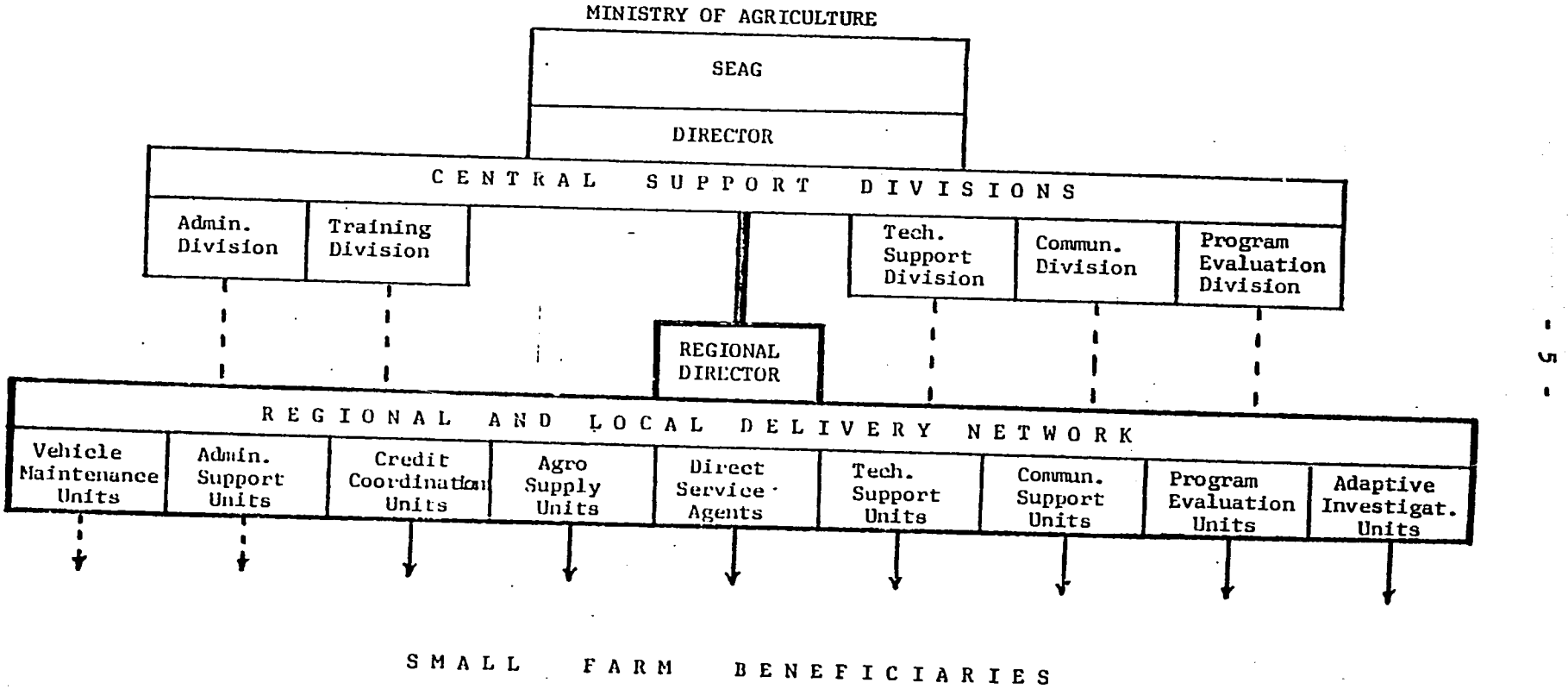
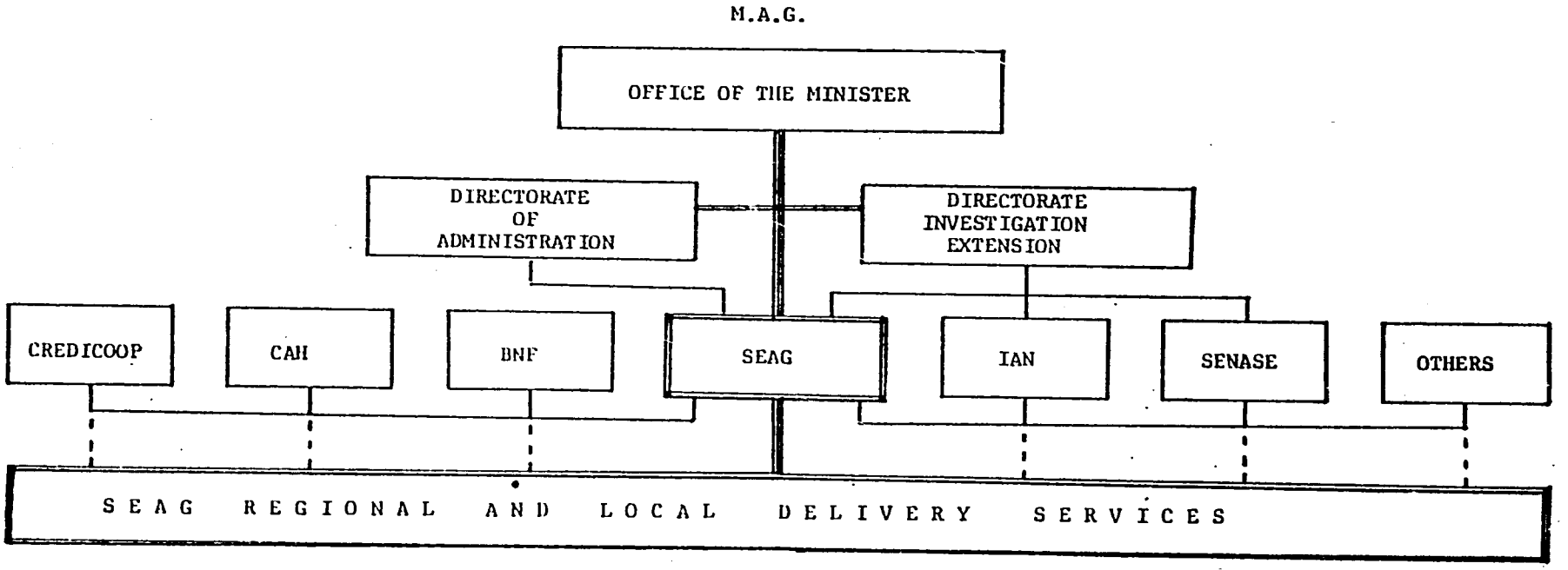

MINISTRY OF AGRICULTURE
SEAG
DIRECTOR
CENTRAL SUPPORT DIVISIONS
Admin. Division
Training Division
Tech. Support Division
Commun. Division
Program Evaluation Division
REGIONAL DIRECTOR
REGIONAL AND LOCAL DELIVERY NETWORK
Vehicle Maintenance Units
Admin. Support Units
Credit Coordination Units
Agro Supply Units
Direct Service Agents
Tech. Support Units
Commun. Support Units
Program Evaluation Units
Adaptive Investigat. Units
SMALL FARM BENEFICIARIES

FIGURE II


M.A.G.
OFFICE OF THE MINISTER
DIRECTORATE OF ADMINISTRATION
DIRECTORATE INVESTIGATION EXTENSION
CREDICOOP
CAH
BNF
SEAG
IAN
SENASE
OTHERS
SEAG REGIONAL AND LOCAL DELIVERY SERVICES

The core of this technology delivery network is the interdisciplinary professional teams to be formed at the regional centers. These teams will have four major functions: First, to survey the state of the art of local agriculture (climate, land use, farm economy, labor inputs) to identify constraints on increased production. Second, to introduce techniques or equipment to overcome these constraints, ensuring to the degree possible that the inputs and equipment so introduced can be manufactured locally, or at least within Paraguay. Third, to develop and promote use of farmer training and education materials better suited for low cost diffusion through local media and other methods. Fourth, to establish an information and feedback system in order to evaluate their efforts within their region and to maintain appropriate linkages to the other centers and to other sources of technology.

These teams will act as a catalytic element in bringing together all technical elements at the farm level; e.g., machines, seeds and management techniques. Any changes they propose in the manner farmers currently do their work must take cognizance of the whole farm operation, and must be appropriate to the social context in which the target group lives. That is, changes must be simple enough for the "campesinos" to use and/or maintain; inexpensive enough for them to buy; adaptive to their local social conditions; and sparing in the use of scarce or imported resources.

These innovation teams must be prepared to live and work in their assigned regions. It is important they develop a rapport with their farmer clients and a thorough understanding of the problems facing them. Members of the teams will collectively and individually establish pilot projects on small farms, either as research or demonstration plots, or both.

The pilot research activities may be in any area of farm life: crops, livestock, post harvest, household management, nutrition and food preservation, credit, cooperatives, nonformal education, etc. The agricultural technician will survey actual small farm problems. The technician and the farmer-client will discuss possible solutions. The technician will seek professional guidance from the regional center, from the technical support services available from SEAG's central office, and from the Ministry's research facilities. The technician will discuss possible solutions with the farmer, and both will agree upon a field test, i.e., pilot project. Each agrees what their inputs should be, and activity is initiated. The farmer will carry the day to day implementation responsibility, and the technician will return at critical junctures to monitor its progress.

Whether the trial project succeeds or fails, the technician must maintain complete files on the research results and must report regularly to the regional center director on experiments undertaken. The detailed results will be distributed to all other centers and agencies, so that they can duplicate successes and avoid repetition of failures. In addition, the communicator supporting the team will devise radio programs, photonovels or other training techniques for disseminating positive lessons learned to

large numbers of farm families. Teams will work with groups whenever possible, and demonstration activities undertaken with groups, such as cooperatives or farm organizations, will be given priority over projects undertaken with individual farmers.

From the outset of the pilot research, small farmers will be directly involved in the tasks at hand. They will donate their labor and other onfarm resources to the project. In turn, the technician will provide them with a few modest outside inputs or resources to get the project started. Because of their personal involvement, participants are likely to be anxious to make a success of the experiment. It becomes a forum in which local users of new technologies and the change agents meet to design, implement and evaluate the merits of new solutions to old problems. By locating these activities on the farms of the participants, local ingenuity is encouraged and "ivory tower" solutions are minimized. The likelihood of local adoption is greatly increased because local people participate in developing and monitoring the new technology.

A farm management activity developed under an earlier A.I.D. grant project (526-0105) will also be incorporated as part of the operating procedures of the local delivery networks. Using the methodology already developed, small farmer paratechnicians will be hired to assist their peers in establishing and maintaining a simple but uniform record system adequate to show farm performance. The paratechnicians will be paid a small fee to work with a group of up to ten small farmers, helping them to note expenditures and proceeds on an approximately weekly basis on standard forms. The information will be ordered in a manner to show operating results by major crop or crops as well as to estimate the net income of the whole farm. The local SEAG agents will assist the paratechnicians from time to time and, together with support from the regional centers, will be responsible for analyzing performance of the entire group. The reasons for individual outstanding performances will be investigated and the information shared with the entire group. The operating results of each year will be used to improve farm planning at the beginning of the following year.

The farm management activity will be expanded to reach between 700 and 1,000 small farmers. Approximately one half of the local field agencies will be working with one or more paratechnician/small farmer groups. The activity will continue to be under the supervision of SEAG's rural administration support unit until the centers in each region become operational. When operational, the centers will have full responsibility for managing the farm management activity. As discussed in the evaluation section, the regional centers will use the record keeping data as a device for providing essential feedback on the effectiveness of over-all SEAG operations in the area.

In summary, the regional centers will become the key link between the farmer and all sources of technology innovations. It is expected to have

a catalytic effect on the local field agents and to draw researchers and other small farmer support activities, within and outside of SEAG, closer to the local level. The centers will actively seek the participation of regional credit offices, such as the BNF, CREDICOOP and CAH, in order to develop coordinated approaches at the local level. (SEAG already has general operating agreements with BNF and CREDICOOP). Over time, the centers will become depositories of expertise and information in their respective regions, and it is reasonable to expect their participation will be actively sought by national as well as local level organizations concerned with development. Once fully operational, the centers will be able to identify specific marketing impediments and should be influential with local level organizations responsible for implementing the A.I.D. Rural Roads and Market Towns projects proposed for future funding. All in all, the technology delivery teams of the regional centers will be an important contribution towards a bottom-up development strategy.

A variety of cost elements have been identified as necessary to bring about the effective functioning of the local delivery networks. Incremental operating costs and investment in related equipment and vehicles account for an important share of Project funds. The GOP will finance all salaries of new regular SEAG positions under its contribution. The GOP contribution and the A.I.D. loan will share in financing operating costs directly connected to the Project, with A.I.D. loan financing a gradually declining proportion on an annual basis.

Operating costs include fuel, per diem, local travel, supplies, rent, utilities and miscellaneous services. The pilot research and the farm management activities will also be treated as reimbursable operating costs. Additional items eligible for financing will include agricultural inputs and implements in connection with demonstration plots. Investment costs are principally for field vehicles (91 diesel pickup trucks and 36 motorcycles lightweight types appropriate for travel on trails in agricultural areas), office equipment and furniture, and a variety of printing, audiovisual and other types of equipment for strengthening SEAG's communications capacity.

Three additional activities that the Project will finance in order to provide needed support to the local SEAG delivery networks are described in the following paragraphs. The technical assistance and training components of the Project are described thereafter.

Small-Farm Machinery Development

Paraguay currently has no organized public mechanism for providing mechanical innovations to small farmers, even though there is substantial evidence of need for mechanical technologies which will increase the output of available farm labor. What is required is an appropriate mechanical technology (not necessarily a tractor technology) which fits the particular

labor and capital resources encountered among Paraguayan small farmers. The Project provides up to $365,130 for a small mechanization unit with the objective of developing capacity within the Ministry of Agriculture to generate a flow of mechanical technology suitable to small farmers. Such capacity will include the ability to:

1) research mechanization problems based upon needs identified by the regional centers;

2) select or develop designs of simple machines appropriate to those needs;

3) build prototypes of such machines;

4) test, modify and retest, as necessary, the prototype machines;

5) assist interested manufacturers to initiate production of proven prototypes;

6) train change agents, including extensionists, on the proper use and maintenance of such machines to prepare them to instruct their clientele.

The small farm machinery development unit will be established in the "Escuela Agromecánica de Caacupé"(EAMC)" located at IAN's research station at Caacupé. SEAG will enter into a sub-agreement with the school, which will assign Project resources, specify operating criteria and establish administrative and procedural arrangements.

The EAMC will study each proposal and develop a plan of action. A task order will be signed between SEAG and EAMC specifying the work to be carried out, the costs involved and the payment mechanism. A methodology for field testing will be specified and arrangements made for promotion of use by small farmers identified. Within the individual subprojects, funds may be set aside to underwrite the local production by individuals or small shops in the area in which the machinery is to be used. This will minimize the spare parts and service requirements. If credit is necessary to finance acquisition of the machinery, the regional center will contact local credit agencies of BNF, CREDICOOP, or CAH in order to assist in arranging the necessary financing at either the farm level or directly with the local manufacturer.

The new research and development unit within the EAMC will prepare and submit to the project committee a research plan describing the current state of appropriate technology research world-wide, and what kinds of appropriate technologies the new unit will focus on to avoid duplication.

EAMC will also act as a reference source for information on similar innovations in other developing countries. It may propose specific subprojects with regional centers based on its knowledge of successful experiments outside of Paraguay. EAMC is currently being assisted in its curriculum development and training activities by a team provided by the Swiss Government. The team is receptive to this Project activity and would support the work.

The Swiss Government is contributing one long-term Agricultural Engineer to manage the EAMC's prototype shop. The British Silsoe group has tentatively committed itself to provide two experienced long-term Technical Assistants to supervise prototype testing at the farm level.

The GOP's contribution would cover the value of the land on which the shop will be built as well as incremental operating costs and a gradually increasing share of the subproject activities.

Improved Seeds

Under the Project, the Ministry's National Seed Service, SENASE, will supervise the production, classification, analysis, treatment, storage, and distribution and sale of all improved seed varieties and hybrids developed and/or successfully tested by the research stations and regional centers. To help provide SENASE's capacity to do so, up to $450,000 of the A.I.D. loan will be used to establish a revolving fund which will provide interim support to producers growing certified seed and cover the packaging and related costs until the proceeds from the sale of the seed are collected.

To gain the confidence of small farmers who participate in the Project, SENASE must stockpile certain seeds for which there is an uncertain demand. This is a normal hazard of being a certified seed supplier, and one which the GOP must be prepared to take if it wishes to help the small farmers to improve their situation. Private entrepreneurs cannot undertake this task because the limited size of the Paraguayan market makes the risk incommensurate with potential profits. The proposed revolving fund would offset the GOP's element of risk and allow SENASE to participate creatively in the Project.

To ensure that new seeds are available to small farmers, SENASE must undertake an outreach program in collaboration with other elements of the Project. Various possible means will be explored to bring about an effective method of distributing seeds at reasonable prices to small farm communities, rather than making the farmers come to SENASE's sales outlet in Asunción. One possible means, which will be tested, is to have the municipalities of the small rural towns sell the seeds as part of their municipal services. The Municipal Development Institute (IDM) endorses the idea because it would provide the means for these small towns to generate revenue. The local office of BNF, CREDICOOP and other service type operations provide other possible outlets. Seed distribution must be coordinated with or complement other SEAG actions. For example, SEAG's expanded communications capacity as a result of the Project can prepare radio programs, pamphlets, and other means of announcing availability of seeds. The paratechnicians hired for the farm management activity could also distribute information on how to obtain seeds.

The revolving fund will be disbursed and controlled on a specific needs basis. That is, funds will be allocated for production and handling of a

given amount of seed for a specified crop identified by a SEAG regional center. SEAG will negotiate a blanket agreement with SENASE to be supplemented by specific task orders issued by regional centers. Each such use will be evaluated after an appropriate period to determine both its profit or loss and factors which contributed to that result. Through such a system, SENASE should be able to gain knowledge and experience that will enable it over time to increase the chances for success with such endeavors.

Small Farm Crop Research

SEAG has tentatively identified a number of crops and farm activities which it considers to have high potential benefits for small farmers. Therefore, up to $166,000 of Project funds will be allocated to assist in financing research on those crops and cropping systems that show possibilities of having significant importance to small farmers.

While other donor programs have assisted with the building and major equipment requirements of the national and regional stations for agronomic and horticultural research, the productivity and efficiency of these stations remain limited by lack of operating funds, particularly with respect to applied research for other than traditional crops, i.e., cotton and tobacco.

Project funding would permit IAN and any other entity with a capacity for research, such as the National University, to carry out relevant applied research projects directed toward specific problems of Paraguayan small farmer agriculture. Priority will be given to interdisciplinary investigations which are planned within the framework of the entire farm enterprise, and which include economic evaluation of variable effects as an integral component. Any given investigation may concentrate on specific aspects of that enterprise, e.g., agronomic practices, cropping systems, or vegetable, fruit, poultry or livestock enterprises.

SEAG will enter into subagreements with IAN and other researchers to carry out the types of investigations described above for a specific list of crops and cropping systems. IAN will be responsible for reporting progress to SEAG, and SEAG approval will be necessary on all requests to USAID for disbursement under this Project component. The subagreements may include provision for the reproduction of planting materials and seeds on a limited scale in anticipation of the needs of the pilot research projects to be attempted by the regional centers, and reproduction of fruit trees and plants for sale to small farmers.

Training

The A.I.D. loan and grant will provide up to $497,600 for upgrading SEAG personnel through a comprehensive training program.

Slightly more than half the funds will be used for short-term training designed to overcome specific weaknesses. SEAG's training division will carry out or arrange for training for its local field agents, for the communication specialists, for planning and administrative personnel and for other staff concerned with the Project. The courses will be from 2 to 15 days' duration. SEAG plans to hold some 43 courses during the Project implementation period. Approximately $117,600 will be required to cover the costs of locally contracted instructors, per diem, travel, supplies and materials and other related items. This budget is planned to be sufficient to reach over 900 participants, since most employees will participate in more than one training exercise.

Short-term training outside of Paraguay will include observation trips and participation at workshops and seminars as well as formal course work at selected institutions, such as USDA's training facilities in Washington. It is estimated that some 15 observation or workshop trips will be funded (at $2,000 each) and some 30 trips to short-term formal courses of 6 to 12 weeks' duration will be funded (at an average of $4,200 each).

Long-term training will be limited to the Master of Science level. The training will take place in other Latin American countries as well as in the U.S. Funding is provided for up to eight persons for two years each with an estimated cost of $14,000 per student year. Priority subject fields for training at the Masters level will be in rural sociology, agricultural economics, and extension communications.

Since only eight individuals will receive long-term training, selection will be made by the SEAG Director, carefully considering such aspects as career commitment and availability of suitable positions and salaries for the returning participants. Before leaving the country, each long-term student will sign a document which represents a special type of loan covering the anticipated cost of his studies abroad. Upon returning to the country with a Master's Degree, a third of the loan will be forgiven for each year of work in SEAG. Should the student decide to take a job outside the public sector, he or she will be required to repay the outstanding amount of the loan, which SEAG can utilize to finance other candidates.

Technical Assistance

The A.I.D. grant will finance three resident U.S. advisers for a total of eight person years and up to 39 person months of short term U.S. consultants. The A.I.D. loan will finance an additional 21 person months of international consultants and up to 135 person months of local consultants. The role of the resident advisers will be to assist SEAG with carrying out certain aspects of the Project, providing on-the-job training in the process, and to help USAID monitor the Project. The advisers will be located in SEAG and will provide convenient, but not exclusive, liaison for the USAID Project Manager.

The estimated requirements are as follows:

- Communication/Diffusion Specialist, 2 years. This individual will work with SEAG's printing and communication division. His primary functions will be to assist SEAG in developing the capacity for working effectively with a variety of media, particularly mass media, and to incorporate the integrated and effective use of such media into programs designed for helping small farmers. The specialist will develop strong working relationships between the regional centers and SEAG's Central Office communication staff.

- Extension Specialist, 3 years. This individual will work with SEAG's program and evaluation division in developing and perfecting the methodology to be used by SEAG and the regional centers in planning and programming their work. The expert will also assist SEAG in developing and maintaining coordination with the Project activities outside of SEAG. He is expected to have sufficient experience to serve as trouble shooter in almost all technical aspects of the Project.

- Administration/Implementation Specialist, 3 years. This individual will join the Project immediately after signing of the Project Agreement to assist (1) in the organization of SEAG's administrative division (2) in preparation of procurement documentation, (3) in preparation of condition precedent documentation and (4) in the development of the administrative manuals and procedures necessary for timely project implementation. He will assist in developing and maintaining financial controls and records on Project activities. Further, the Specialist will work with SEAG's management in setting up and operating a management information and control system.

The short-term consultants will assist in assessing Project progress from time to time and in establishing evaluation criteria and procedures. For example, experts in the use of farm management record systems will advise USAID and SEAG on the expansion of this activity and the analysis of the resulting data. Sample design experts may be obtained to help decide on how best to locate the paratechnicians in order to have reliable data for evaluation. Also, experts on institution building and appropriate technology may provide insights to USAID during implementation.

The loan will fund approximately $291,900 in short-term consultants and specialists from eligible source countries, including Paraguay. Included will be specialists in a variety of activities related to the Project, such as highly technical aspects in communications and use of mass media, crop and livestock operations, home economics, personnel training, and program evaluation.

The staff of the National University will be a good source for a number of these short-term specialists. International research institutes will be another source. The resident advisers will assist SEAG in identifying each need and locating such qualified specialists.

III. PROJECT SPECIFIC ANALYSES

In accordance with the Project Paper instructions, the complete technical, social and economic analyses are included as attached Annexes Nos. III, IV and V. The brief discussion which follows summarizes findings elaborated upon those Annexes. The technological analysis addresses the question of whether inadequate agricultural technology is a constraint to Paraguayan rural development. The social analysis identifies and describes the small farmers who are most troubled by the technological constraint. The economic analysis demonstrates the cost/benefit and economic viability of the Project. All of these analyses depend heavily on the same bodies of published and unpublished materials: agricultural censuses, cadastral and malarial maps, the 1972 and 1976 Small Farmer Surveys, and various independent research studies related to Paraguayan agriculture.

A. Technical Feasibility

After defining what is meant by "new" technology Annex III surveys the agro-economic conditions existing on small farms and establishes that there is a need for improved technologies on small farms, largely because crop yields and labor efficiency in Paraguay have been low traditionally. Methodologies used to complete the Small Farmer Subsector Assessment are used to make these determinations. The premises of the analysis is that small farmers behave in an entirely rational economic manner and that any innovations introduced among them must also be economically rational and culturally competitive within the local environment.

The technical description of the mechanization sub-project shows that it is reasonable and practicable to develop and manufacture appropriate farm machinery in Paraguay. The engineer-approved designs for the technical aspects of the mechanization building and equipment are included. These facilities will complement those existing at the National Agro-Mechanical School at Caacupé.

A separate Unattached Annex for Technical Feasibility, to be maintained in USAID and LA/DR files, contains two important sections: (1) A description of the Agro-Mechanical School, and (2) A detailed list of equipment to be used at the School. According to this Annex the Project is technically feasible and meets all requirements for reasonably firm cost estimates.

B. Social Feasibility

Annex IV identifies, enumerates and characterizes the proposed target group and the geographical areas in which they live. Using available maps as sources, a series of Spatial Distribution Cluster Maps indicate

that 635,000 potential beneficiaries live on approximately 96,000 farms within the zones selected for the seven regional centers.

This analysis matches intended beneficiaries and the delivery institution and concludes that, at a minimum, the Project will serve approximately 50,000 farms and the 381,000 minifundistas living upon them. The analysis further demonstrates that almost all beneficiaries in this Project will farm under ten hectares and certainly no more than twenty. Even then these beneficiaries normally do not cultivate more than three hectares because of family labor constraints. The analysis concludes that farmers in the target region earn less than $150 per capita in 1969 prices ($330, 1977) and therefore fall within the A.I.D. target group definition.

After weighing various factors the analysis draws the conclusion that "the Project will assist small farmers to use the output of relevant agronomic, farm management and livestock research to increase annual output per hectare, using increasing amounts of labor as well as other inputs. Out of the higher incomes to be generated from sales of basic agricultural products smallholdes will be able to mobilize for further investment. This will be accompanied by an increase of purchases by the farmer of new seeds, other agronomic inputs and consumer items. These increased purchases will, in turn, stimulate a general program to increase off-farm employment through small scale rural industry, such as the manufacture of technologically appropriate farm machinery".

C. Economic Feasibility

The anticipated economic results of the Project are that (1) national income will benefit through increased agricultural output and (2) farmer welfare will benefit through increased net farm income and improvements in quality of life factors. Increased agricultural output is expected through intensification of small farmer activities by application of new technologies and perhaps by crop substitution and expansion of area cultivated. Improved farmer net income is expected through various combinations of technologies that increase farm production and farmer productivity and/or lower the unit costs of production. An important intangible improvement to farmer welfare is expected as a spin off of the farm mechanization activity. The implements and equipment to be produced under this activity, in addition to bringing income benefits, will reduce the drudgery of the traditional farming techniques. Other benefits will undoubtedly be generated for the participating farm family as a result of expanded contacts and interaction with SEAG agents and other small farmer clients of SEAG.

It is difficult to quantify the value of economic benefits to be generated. Recent literature attributes extremely high returns to the application of new farm technology developed at agricultural research stations. Some economists believe that such high rates of return may not adequately

take into account the offsetting expenditures of unsuccessful research and of the development of technology transfer network. 1/

In Paraguay's case there is cause to believe, however, that for the reasons pointed out in the technical analysis, investment in modern, appropriate technologies for the small farm will have sizeable payouts. While a priori analysis of the benefit/cost ratio of this Project is tenuous, USAID estimated the level of farm income benefits that would result if current crop yields in the target regions were raised only to Paraguay's national yield levels through the establishment of a regional rural delivery system. In the calculation of a benefit/cost ratio no attempt was made to incorporate benefits accruing from increasing the area under cultivation with the benefits accruing from raising per hectare yields because of the added complexity involved in distributing the benefits derived from two variables over time. Nevertheless, an estimate was made of total net benefits obtained from what is considered a reasonable increase in the area under cultivation as a result of the project to give an idea of their potential importance.

Although increasing the area under cultivation would go far to increase Project benefits , the increase in the yield factor alone demonstrates a B/C ratio greater than 1. Two analyses of benefit/cost are included in Annex V. One demonstrates that if only the target beneficiaries raise their production to Paraguay's national yield level the Project will have a benefit/cost of 1.023 (Table 2 Annex V). It is likely that this will be exceeded and that all of the target regions will, at a minimum, be able to raise their yields to the national level. If that takes place, the Project will yield a benefit/cost ratio of 1.707 (Table 3 Annex V). In conclusion, the Project appears to be economically feasible and cost effective, even when the most modest expected increases are used as standards for benefits.

D. Administrative Analysis

1. Organizational Features

The proposed Project is to be carried out by the GOP agricultural and Livestock Extension Service, SEAG, which is a department level agency within the Directorate of Agricultural and Forestry Investigations and Extension. It was established in 1951 as part of the U.S.

1/ Reed Herford and Andrew Schmitz, "Measuring Economic Returns to Agricultural Research", Resource Allocation and Productivity in National and International Agricultural Research. Edited by Thomas M. Arndt, Dana G. Dalrymple, and Vernon W. Ruttan, University of Mennesota Press, 1977.

Government Servicio program jointly managed by U.S. and Paraguayan staff. The Servicio was discontinued in 1967 and SEAG was given departmental ranking in 1969.

SEAG has a centralized structure with divisions for technical support, administrative support, communications and reproduction, programming and evaluation, and training located in the Central Office in San Lorenzo. Approximately 22% of its 217 employees are in the Central Office. The remainder are located in 77 local agencies, with the field agents reporting to the Central Office through zone supervisors, who are themselves senior field agents located in the larger towns. Administrative support and overall decision making is dependent upon the Central Office.

The Project will enable SEAG to decentralize through the establishment of well staffed regional centers that will work directly with satellite service agencies within their zones of operations. Seven regional centers will be organized in small farmer areas currently being served by 31 SEAG local agencies. An additional 12 agencies will be formed plus one additional agency outside the Project. Consequently, by the end of the Project, SEAG will have a total of 90 service agencies, of which 43 will form a part of the regional centers. SEAG expects to extend the regional center concept eventually to all its operation with its own resources after completion of the A.I.D. assistance.

The Minister of Agriculture and the Director of SEAG are committed to this decentralization scheme because the GOP generally is promoting greater regional participation in its development effort.

2. Administrative Arrangements

In assessing the administrative feasibility of the Project, USAID drew heavily on a 1973 FAO study of SEAG and a 1977 appraisal of the Project's functional and organizational aspects prepared by an A.I.D. consultant (Howard Ray), which was updated in February 1978. A 1976 study prepared by SEAG with UNDP/FAO assistance was also used.

A separate project administration division will be established within SEAG to give SEAG full control of Project resources. Each Regional Center will have a small administrative support unit (1 or 2 people) to service the center and its satellite agents. All payments, except salaries will be managed by this administrative network. Salaries will continue to be disbursed from the Ministry's Central Administration.

- SEAG's Administration Division will handle all procurement, except for minor local purchases at the Regional Centers. The Division will purchase gas coupons for distribution to the centers; negotiate service contracts; handle travel, per diem,

and timekeeping for the Central Office personnel; and process vouchers and receipts from the support units.

- The administrative support units will handle per diem and travel, timekeeping and record keeping for the regional centers and service agencies.

The Ministry's Director of Administration supports this approach and will assist SEAG in obtaining the necessary authorizations and training for the administrative personnel.

The creation of an administration division within SEAG means that responsibility for procurement actions will be clearly identified. This will facilitate developing skills in A.I.D. procurement procedures. It also means that SEAG will be able to control the frequency of the activities which are not under its day-to-day direct supervision, such as the mechanization and the seed components. Thus, if these activities are not managed to SEAG's satisfaction, it will be able to (or threaten to) stop payments until remedial actions are taken. Moreover, the extension of administrative services to the regional centers will help assure that the equipment and logistic support requirements of SEAG's expansion program can keep pace with staff expansion. Given this type of administrative structure, and in view of high level Ministry support, the SEAG Director should be able to minimize possible implementation impediments.

The first phase of the Project calls for the opening of three regional centers. Therefore, a number of prior actions must be taken to adopt appropriate fiscal and administrative procedures and to provide the required training to the staff prior to opening these centers. Procedures developed under the A.I.D. Cadaster Loan (526-W-026) for providing field crews with timely travel and per diem payments, vehicle maintenance, and expendable supplies will serve as a model. The Project Agreement will require SEAG to establish the necessary procedures and carry out the required training before the first loan disbursement for operating the centers. The A.I.D. grant will cover the costs of necessary pre-implementation training. The grant will also finance an administration/procurement specialist who will assist SEAG with establishment of the procedures necessary for decentralization as well as with loan procurement actions. [The individual actions are identified in a pre-implementation planning network that is shown in Annex VI].

3. Management and Key Personnel

The key personnel for carrying out the Project are the SEAG Director, the SEAG Administrator, the directors of the regional centers, and the technical personnel of the regional teams. The SEAG Director is a recognized professional agronomist (ingeniero agrónomo) who has been

director for almost four years. He is a career SEAG employee, who completed his Bachelor of Science studies at New Mexico State University prior to being named Director. Organizationally, he reports to the Director of Research and Extension, administratively, he is dependent upon the Directorate of Administration; operationally, he enjoys direct and frequent contacts with the Minister. In Paraguay, changes of high level officials are not frequent, and it is reasonable to expect that both the SEAG Director and the Minister will continue in office at least during the crucial initial years of the Project and probably through the entire implementation period.

The Chief of the SEAG Administration Division will probably be an employee transferred from the Directorate of Administration, which will facilitate close coordination with the Directorate on hiring personnel, paying salaries, and coordinating with other Ministries. The Ministry's Director of Administration will provide his influence and support in obtaining a well qualified person to fill this key position.

The directors of the regional centers will be selected on the basis of their technical and leadership qualifications. Some of the current SEAG zone supervisors will be candidates for these positions, particularly for the first three centers to be opened. Adequate training will be provided under the Project.

The regional team members will be selected largely from recent graduates of the Faculties of Agriculture and Veterinary Science at the National University, or from other technical level people with relevant experience. SEAG considers that these new positions can be filled with qualified personnel or personnel who can be upgraded through in-service training. The Agricultural Faculty currently graduates about 40 professionals (ingenieros agrónomos) annually. There are four secondary agricultural schools that produce approximately 120-140 graduates every year. The phased requirements of all new personnel are estimated in the table on the following page.

Based on its general knowledge of the current employment situation, USAID concurs that sufficient local personnel, if given additional training, should be available for the new hire requirements of SEAG. Therefore, the Project includes provision for in-service training and orientation within Paraguay and for sending technical personnel for out-of-country short term training and, to a lesser degree, graduate training at the MS level. The advisors financed under the Project will furnish on the job-training. Also the A.I.D. grant will finance the travel of the Director of the three initial regional centers to Mexico and Guatemala to observe similar programs prior to initiation of their work in Paraguay.

The principal factor in obtaining qualified personnel, particularly those in the regional centers, is the salary level. Given the low

REQUIREMENT OF NEW PERSONNEL

Central Office	Present Staff	Additional People per Year					
		1	2	3	4	5	Total
Director	3	-	-	-	-	-	-
Programming & Evaluation	4	-	2	1	-	-	3
Training	1	2	-	-	-	-	2
Communications	5	-	6	5	2	-	13
Technical Support	16	-	1	1	-	-	2
Administrative Support	18	4	2	2	2	-	10
Regional Centers							
Directors	0	3	2	2	-	-	7
Other Technicians	0	6	23	17	13	-	59
Administration	0	3	5	4	2	-	14
Mechanic	0	-	6	4	4	-	14
Agencies							
Regional Supervisors	11						
Chief Agents, Livestock Advisors, and Assistants	93		4	4	4	-	12
4-C Clubs Agents	15		4	4	4	4	16
Home Economic Agents	35		2	4	4	4	14
Secretaries and Others	16						
T O T A L		18	57	48	35	8	166

public sector salary scale, SEAG's ability to pay the salaries necessary to attract these individuals is problematical. During earlier stages of Project development, USAID contemplated temporary salary supplements of selected positions in order to help overcome the problem. This was discarded partly because of the difficulties envisaged in monitoring the administration of funds. Also, the fact that the Project has been redesigned to reduce significantly the emphasis on experiment station level research lessens the importance of the salary problem, since the Project is no longer so dependent on attracting and retaining highly trained researchers. More fundamentally, however, the problem of low salary rates cannot be treated satisfactorily on a piecemeal basis by temporary loan funding of salary supplements. The highest levels of the Ministry must be prepared to take the necessary actions to assure a realistic pay scale structure. In order to focus continued attention to this potential problem, the Project Agreement will contain a special positions necessary to carry out the Project as planned and with a salary structure adequate to attract and maintain qualified personnel in such positions. USAID will monitor compliance with this covenant in connection with its review of the annual reviews of SEAG's programs and budget. The proposed budget plan contains what USAID considers reasonable salary levels and adjustment factors.

4. Monitoring Arrangements

The USAID/Paraguay staffing pattern calls for three U.S. direct hire positions in the Rural Development Office. One of these positions will be a full time Project Manager for this proposed loan/grant activity. The Project Manager will have a Paraguayan professional assistant and a secretary. The USAID's Paraguayan training officer will assist the Project Manager with the training component of the Project. All Paraguayan staff are currently on board, but only one of these U.S. positions is filled. Since it is crucial that the Project Manager devote full time to this Project during the start up period, the remaining two U.S. positions should be filled as soon as possible.

USAID will be assisted in carrying out its Project monitoring responsibilities by the resident advisors provided under the grant. While these advisors will be providing on-the-job training for GOP personnel and assisting SEAG in Project implementation, their reports and close daily contacts with SEAG personnel will supplement the Project Manager's own monitoring efforts. Also, the grant will be flexible enough to permit funding of a variety of short term advisors in areas of joint SEAG/USAID interest pertinent to Project implementation.

The USAID Project Manager will be expected to maintain liaison with other foreign resident experts who are working with the Ministry research and extension activities. Chief among these will be a proposed addition to the Swiss advisory team at the EAMC. If the A.I.D. Project is approved,

the Swiss Government will provide an expert in small machinery to work with the mechanization activity, thereby furnishing technical support to USAID's own monitoring efforts. The OAS is supporting a study of an integrated rural development program in an area coinciding with one of the regional centers. The information developed under the study will be an important tool for programming the center's activities.

5. Conclusions

The Project is designed to strengthen SEAG in crucial aspects, including organizational and administrative as well as technical, thereby enhancing the Project's administrative feasibility. The decentralization focus of the Project is intended to encourage greater grass roots participation of the ultimate beneficiaries, the rural poor. Pertinent considerations are:

(1) SEAG's leadership is professionally recognized and stable and has a strong power base, particularly in view of the increasing emphasis on the agricultural sector within Paraguay's development priorities. This leadership is committed to the basic concepts of the Project.

(2) SEAG's plans for phased expansion under the Project appear feasible. However, the question of adequate salary levels for professional personnel will continue to be a concern that will require constant attention of SEAG's Director and USAID.

(3) In order to avoid implementation impediments it is essential to place Project control as fully as possible with SEAG. Accordingly, the Project includes the creation of an administrative unit within SEAG, supported by the Administration Department of the Ministry and assisted by a resident advisor provided under the grant.

(4) No new USAID staff positions are needed to monitor the Project, but the current vacancies in existing U.S. positions must be filled as soon as possible.

E. Environmental Concerns

Based on the Initial Environmental Examination, the AA/LA made a negative Environmental Threshold Decision on November 22, 1976. Although the name, funding, and life of Project dates have been changed, the Project remains essentially the same as when initially presented. It is believed that no new IEE will be needed. Documentation related to these decisions accompanies this Paper as an Unattached Annex in the LA/DR and USAID Files.

USAID intends to use funds other than those in this Project to sensitize Paraguayans to the hazards and proper usages of farm chemicals,

especially herbicides and pesticides. This Project does not anticipate any sizeable acquisition of chemicals, but some will invariably be used in making the host government aware of the environmental impact of various farm chemicals, and USAID intends further to promote this activity through separate grant projects that will complement this one.

IV. FINANCIAL PLAN

A. Cost Estimates

The Summary Cost Estimates and Financial Plan (Table 1) and the Projection of Expenditures (Table 2), are drawn from detailed costs estimates prepared by SEAG and USAID that are contained in Unattached Annex A in the USAID/P and LA/DR Bulk files. The cost estimates are based on the expected requirements of establishing seven SEAG regional centers, expanding local agencies from 31 to 43 in the Project area, and supporting activities from SEAG's Central Office and from other participating agencies.

Position by position estimates of personnel requirements were made. An inflation factor of 8% per year on payroll was assumed as necessary and appropriate in view of Paraguay's recent and expected inflation rates, the generally low level of public salaries, and the increasing opportunities in the private sector. Local travel and operating costs were calculated based on actual rates but assuming substantially increased staff travel and better vehicle maintenance. The number and types of vehicles needed to support a higher degree of mobilization were identified by location. Detailed equipment lists were prepared using current prices and SEAG's estimates of actual needs. An 8% annual inflation factor was also added to most line items. Allocation of funding for entities outside of SEAG was developed jointly with those entities and SEAG. A 10% contingency factor was added into individual categories as appropriate.

Although the Project budget is detailed, it is not intended to reflect an inalterable course of action. For example, the number and location of local field agencies may be modified during Project implementation to take into account future budget constraints that might develop as well as improved spatial planning. What will always be kept in mind in making changes is that the nature of the Project is one of establishing a process in SEAG and other agencies to assist the small farmer. The size of the Project and the corresponding cost estimates thus represent USAID's best judgement at this time considering such factors as SEAG's absorbtive capacity, budget negotiations with the Ministry of Finance, and the critical mass necessary to have meaningful impact on the target group.

B. Financial Management

Project management will have to be keenly aware at all times of the relationship between Project progress and financial status. An important

TABLE 1

SUMMARY COST ESTIMATE AND FINANCIAL PLAN
(US$ 000)

Source	AID Loan		AID Grant	AID Total	GOP	Total
	Fx	L/C	Fx			
Use:						
SEAG:						
New Personnel	-	-	-	-	1,720.8	1,720.8
Furniture, Vehicles, Equipment	1,491.2	131.1	-	1,622.3	-	1,622.3
Materials, Inputs	318.7	48.6	-	367.3	322.1	689.4
Per Diem, Operating Costs	181.1	468.9	-	650.0	621.6	1,271.6
Contingency and Inflation	391.0	181.1	-	572.1	677.0	1,249.1
Subtotal	2,382.0	829.7	-	3,211.7	3,341.5	6,553.2
Small Farm Mechanization	67.8	297.3	-	365.1	98.0	463.1
Seed Improvement	-	450.0	-	450.0	100.0	550.0
Research	-	166.0	-	166.0	-	166.0
Participant and Other Training	324.8	117.6	55.2	497.6	-	497.6
Administration	60.0	12.8	-	72.8	117.7	190.5
Technical Assistance	130.4	161.6	944.8	1,236.8	-	1,236.8
Total	2,965.0	2,035.0	1,000.0	6,000.0	3,657.2	9,657.2

TABLE 2

PROJECTION OF EXPENDITURES
(US$ 000)

	AID Loan		AID Grant			
	Fx	L/C	Fx	AID Total	GOP	Total
FY 1979	1,201.9	389.4	204.2	1,795.5	71.2	1,866.7
FY 1980	474.9	473.9	450.6	1,399.4	373.7	1,773.1
FY 1981	589.2	519.9	191.9	1,301.0	705.1	2,006.1
FY 1982	406.6	414.9	144.5	966.0	1,114.2	2,080.2
FY 1983	292.4	236.9	8.8	538.1	1,393.0	1,931.1
Total	2,965.0	2,035.0	1,000.0	6,000.0	3,657.2	9,657.2

financial management tool will be the annual budget review. USAID and Ministry staff will review each new annual budget with respect to current Project needs. At that time the GOP's fiscal performance to date will be reviewed against the overall Project budget, and final decisions will be made on the percentage of local operating costs to be reimbursed by A.I.D. during the next budget cycle. The Project Agreement will have a condition precedent requiring such budget review prior to continuing with local currency disbursement in each Project year.

SEAG's administrative division will be responsible for preparing and maintaining detailed financial records. The resident advisor in administration and procurement will assist in establishing a financial management information system. The division will prepare the information to be considered at the annual budget reviews. Staff of the Ministry of Agriculture's administrative section and of the Ministry of Finance will assist in the reviews.

The administrative unit will also be responsible for preparing various manuals on procurement, vehicle use, and travel and per diem. The manuals will assist the directors of the regional centers in carrying out their financial management and control responsibilities.

C. Cost Effectiveness and Recurring Costs

A cost effectiveness approach is not entirely satisfactory for this Project since at Paraguay's stage of development there is no realistic alternative to a strong public sector extension service in the technology delivery chain. SEAG will continue to exist for the foreseeable future. The GOP and A.I.D. resources to be provided under the Project are intended to increase SEAG's level of operation in order to lower its cost per client, and cost effectiveness considerations will be incorporated in SEAG's annual program exercises. Project expenditures for communications equipment, materials, and technical assistance will assist SEAG to strengthen its low cost outreach through the use of mass media. SEAG personnel will evaluate various pilot mass media approaches and share information with each center, and particularly effective methods for expanding SEAG outreach through mass media will be incorporated as standard procedures. Additionally, each center will be required to demonstrate how its proposed program meets cost efficient criteria by using mass media and other low cost approaches. Centers will be encouraged to compete in developing the most cost effective innovations for reaching their clientele.

A.I.D. financing of SEAG operating costs will be on a gradually declining basis. By the end of the Project, SEAG's annual recurring costs for operating the seven regional centers, their 43 satellite agencies, the central office support function, and the programs with other entities will reach $1,347,800 (at current prices). This amount is made up principally

of the payroll costs of the new positions to be filled during the Project and related increases in local travel costs. SEAG and USAID estimate that at the end of the Project some 57,700 farm families will be reached on a continuity basis. The annual recurring SEAG costs per farm family, then would be approximately $23.36, which would be $3.89 per person assuming an average family size of six. (These figures slightly understate the total cost of reaching a family since the costs of certain current personnel are not included.)

The annual costs of reaching a family compare favorably with SEAG's current estimated cost of $14.75, which reflects a far lower level of service. As a result of the Project, for the first time recipient families will be offered new technologies, improved seeds, and printed materials. For the first time SEAG will have regional offices and a central office equipped to provide proper support, adequately staffed agencies, adequately trained personnel, and sufficient vehicles and operating expense budgets to enable its personnel to work effectively in the field. The recurring cost amount also includes financing for research support at the central level, inputs for test plots, inputs for courses in nutrition and home management, farm machinery prototype development, and funds to continue the farm management program. In short USAID and SEAG believe that the annual per family and person cost will be quite reasonable considering the level of service to be provided and the benefits expected to accrue for the services. For this reason it can be expected that the GOP will continue to finance the project activities once the Project comes to an end. To help insure this, many of the line items in the budget are set up so that the GOP funds an increasing share each year. With the GOP's National Five Year Plan calling for a doubling of GOP budget expenditures in real terms from 1977 to 1981 and for an emphasis on agriculture and services to the small farmer, adequate counterpart levels can reasonably be expected to be forthcoming.

D. Justification of A.I.D. Grant Funding

The proposed grant funding component is necessary for several reasons. First, it generally makes the transition to the harder A.I.D. loan terms to Paraguay more acceptable. Second, it eliminates the criticism and related misunderstantings over high salary and benefit costs associated with long term foreign technicians. Third, it provides USAID with greater de facto control over the use and work of the advisors, thereby strengthening USAID's monitoring consultants to arrive before all the conditions precedent to the first disbursement of loan funds are met as well as to assure that a limited amount of training is undertaken by SEAG personnel who will work in the Project; both these actions are necessary in order to expedite Project implementation. (Note: the counterpart funding for initial startup costs has already been budgeted and will be covering Ministry costs before loan signing and before meeting of conditions precedent.

The portion of the grant to finance short term advisors is essential to provide USAID with a necessary degree of flexibility. Some of the long term advisors may not be fully versed in all aspects of their fields and will need assistance with special peoblems from time to time. Also, USAID will want to bring in experts generally to assist it with reviewing Project activities and with overall Project evaluation. Since such services assist USAID as well as benefit SEAG, it would be inappropriate to insist on loan funding. Further, due to language requirements (Spanish and/or Guaraní), similar project experience in other Latin countries, and travel cost savings, some of the short-term assistance should be authorized from Code 941 sources.

While the GOP is willing to loan fund many of the crop and livestock short term specialists needed to assist SEAG with specific problems, it is clear that the GOP is not prepared to finance the long term U.S. advisors with loan funds given their high costs. The GOP's commitment to service the A.I.D. loan debt (SEAG has no operating income which can be used for loan repayment) amounts to an additional budget contribution to SEAG. The GOP's direct contribution to the Project of 38%, together with the anticipated recurring costs and the loan repayment obligation, far exceeds A.I.D.'s minimum requirements for host country contribution. A.I.D.'s ability to obtain the required degree of internal GOP support for the Project.

E. Conclusions

The Project cost estimates are sound. The annual budget reviews will provide the necessary information to Project management for financial decision making. The recurring costs of the Project appear justified, particularly when considering the expected economic benefits to the target group and to the country. There is reasonable expectation that the GOP will continue and expand the Project after the A.I.D. funds are disbursed. Cost effective principles have been built into the Project design. The Project is financially feasible and is warranted expenditure of GOP and A.I.D. funds. The GOP debt service record is good, and its debt service capacity appears to be increasing. In short, USAID believes the Project is financially sound.

V. PROJECT IMPLEMENTATION

A. Implementation Plan

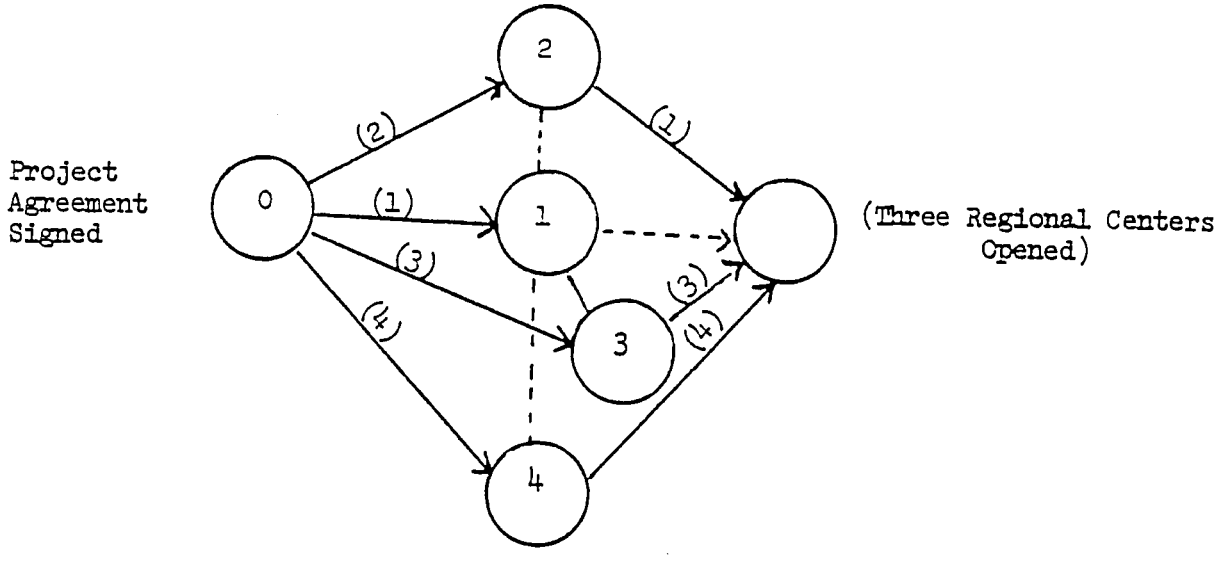
1. Implementation Sequences

Signature of the Project Agreement is planned for no later than September 30, 1978. Since GOP Congressional approval is required as part of the ratification process, at least four months will be needed to meet

the initial conditions precedent to disbursement. The first three regional centers are not expected to start up operations until mid-1979. The year during which each center begins to operate will be dedicated largely to information gathering, analysis, planning, and organization. Also, the farm management activity will be initiated immediately in the area served by the first three centers in order to have a data base. SEAG will form two additional centers in 1980 and two more in 1981. Project funding will continue through 1982 so that the last two centers to be formed will have a year of normal operations under the Project. Assuming that not more than nine months are necessary to complete all outstanding payments, the Project funds would be fully disbursed five years after signing the Loan Agreement.

The initial phase of Project preparation leading to the opening of the first three regional centers and their delivery networks is critical to the overall success of the Project. It requires pre-implementation actions on the part of SEAG and USAID to form a core of four key people to carry out Project preparations. These are: the SEAG (Project) Director; the Chief of SEAG's newly created Administration Division (Project Administrator); the A.I.D. Project Manager; and a grant funded project administration/implementation specialist. It also requires pre-implementation actions by SEAG, with USAID assistance, to obtain catalogs and other reference materials for preparing the specifications for the vehicles and the wide variety of equipment to be purchased under the loan. A detailed Project Implementation Flow Diagram covering this crucial preparatory phase is shown in Annex VI.

As demonstrated by the following diagram, the preparatory phase involves several activity components, which can be carried out independently and simultaneously, but which are subject to conditions involving the release of A.I.D. funds.



The first component (1) involves the signing of the Project Agreement and the meeting of conditions precedent to first disbursement. The appointments of the Project Director and Project Administrator are a part of this component.

The second component (2) concerns dollar procurement of vehicles, equipment, materials and supplies needed by the regional centers and local service agencies. If pre-implementation actions are taken by SEAG to obtain the necessary reference materials, this procurement action can be initiated as soon as the Project Agreement is signed, and orders placed as soon as conditions precedent are met. The grant funded administration specialist should be on board to assist in these activities, which also requires close attention by a full time A.I.D. Project Manager.

The third component (3) concerns the preparation of administrative manuals and guidelines showing the procedures to be used by the regional administrative units, SEAG's administration division and the Ministry's Directorate of Administration. The manuals developed by the A.I.D. loan funded Cadastral Project will serve as a guide for these manuals, and SEAG can prepare draft manuals using them as models. The final manuals and guidelines will require inputs from the administrative implementation specialist.

The fourth component (4) involves a number of activities directly related to the first three regional centers and their satellite service agencies. It requires the appointment of the first three regional directors who, following an orientation training tour, will play an active role in a number of actions such as local procurement, selection of sites for regional and local office, hiring and training of local staffs, and preparation of operational plans for the first six months of operations. The long term communication specialist and extension specialist will be brought on board during this period to assist the regional directors and SEAG staff in the training activities, in the preparation of operations plans, and in other tasks.

In summary, the opening of the first three regional centers is dependent upon the successful completion of a wide variety of independent activities, described above. The initial path is expected to be the dollar procurement actions, which will require at least nine months from the signature of the Project Agreement, and which will delay the start up of the first three centers until mid-1979. The administrative or operational features for the balance of the Project will be based on the procedures and routines established during the preparations for the first three centers.

2. Principal Procurement and Disbursement Features

a. Procurement of Goods

All dollar procurement will be undertaken through the normal A.I.D. letter of commitment/letter of credit procedures. The SEAG administrative unit will be responsible for preparing requests for quotations and IFB's and for related follow up actions. Award of bids will be made by a committee in which the Project Director and Ministry's Director of Administration participate. USAID approval of awards will be required prior to opening the letter of credit. The Ministry's Directorate of Administration will be responsible for obtaining import permits and arranging custom clearance. Local procurement will be made either on a cost reimbursable basis or by direct payment to local suppliers. The specific procedures for selecting suppliers, making payments, and controlling inventory will be described in a detailed procurement manual to be prepared by SEAG's administrative division with assistance from the administration specialist.

b. Operating Costs

Operating costs will consist principally of fuel, travel, per diem, and vehicle maintenance. A Project account will be established in local currency by the GOP for all recurring operating costs. USAID will reimburse the account on a regular monthly schedule at agreed upon funding levels upon receipt of vouchers and other supporting documents.

SEAG Project personnel will obtain fuel by using local currency denominated coupons purchased by SEAG from the refinery and exchangeable at local gas stations. The A.I.D. loan will reimburse SEAG for the proportion agreed upon at the beginning of each budget cycle. The gas coupons will be numbered serially, and use will be controlled by means of a weekly vehicle report system. A detailed manual will be prepared for use and control of vehicles and gas coupons.

Travel and per diem will be handled in a manner similar to that being used by the Cadaster Project. The procedure involves issuance of travel orders by the Project Director or Regional Director, travel itinerary signed by the traveller or his immediate superior, and travel vouchers processed by the Project administrative units. All payments will be made by check. A detailed manual for travel and per diem will be prepared.

Each regional center will have a mechanic and an assistant, who will service all vehicles of the center and its satellite agencies on a regular schedule. Preventative maintenance including daily driver revisions will be stressed. Spare parts will be supplied through the administrative units. Vehicle procurement will include filters and spare parts as appropriate.

c. Training

Four types of training are anticipated under the Project: in-country, travel to other countries to inspect pertinent activities and/or to attend selected conferences, short-term training outside of Paraguay, and long-term academic training. SEAG's training division will be responsible for managing all training activities.

In-country, short-term training will require local currency per diem payments and travel allowances, which will be handled as explained in the preceeding sub-section. Payments to local instructors and renting of facilities, if needed, will be made through reimbursing SEAG. Observation visits and travel to seminars and conferences will be financed under the A.I.D. loan, with USAID issuing GTRs and travel advances.

It is anticipated that a considerable amount of the short term training outside of Paraguay will take place at the U.S.D.A. training facilities in Washington. SEAG will investigate the possibility of entering into a PASA type arrangement with U.S.D.A. permitting direct charge to loan funds. Short term training at other facilities will probably have to be paid for by direct disbursement by A.I.D. A limited amount of long term training is scheduled under the Project. SEAG's training division and USAID's training officer will assist the candidates selected for training with placement in appropriate universities. SEAG and USAID will pursue the possibility of using the A.I.D. letter of commitment procedure to make payments through a U.S. bank to reimburse the student periodically for eligible costs incurred during his training. The student would be required to present evidence of enrollment and good academic standing as part of the billing procedures.

d. Technical Assistance, Consultants, and Specialists

The grant will finance three long term U.S. advisors and selected short-term consultants. The loan will finance short-term specialists from U.S., Paraguay, and other eligible countries.

Immediately following Project authorization, SEAG and USAID will advertise for interested candidates for the resident advisor positions. Proposals from personal service contractors and consulting firms will be accepted. SEAG and USAID will jointly review and select the individuals to be hired. In general host country is expected to be utilized unless in specific cases the USAID determines that direct contracting is more appropriate. Payments will be made in accordance with normal grant procedures and will be subject to SEAG certification on contractor performance. Short-term specialists and consultants will be hired under personal services contract arrangements as specific needs arise. USAID will assist SEAG in developing lists of non-Paraguayan experts on different crops and

specialties who would be considered and contacted when needed. SEAG will identify in-country specialists to be contracted on a short-term basis. SEAG will prepare a standard form personal services contract to be used to hire all short-term specialists and consultants under the Project. Once the lists and form contract satisfactory to USAID are developed, the A.I.D. approval action will be limited to reviewing the need or justification for the services, the scope of work, and the payment rates. Additions to the list of qualified consultants will be made from time to time. Dollar costs will be paid directly by USAID and charged against the loan or grant, based on SEAG authorization. Local currency costs will be reimbursed to SEAG.

e. Other Services

SEAG will sign operating agreements with IAN, SENASE and the EAMC covering their participation in the Project. Periodically, SEAG will request USAID to make local currency payments to these entities in accordance with the approved budget and actual work performed as certified by SEAG.

3. Reporting System

The local SEAG agents will maintain a daily log of their activities and send narrative summaries of work performed to their regional centers every two weeks. The regional center will use these reports to compile a monthly progress report to be reviewed by the Director of the center and forwarded to SEAG's central office. The Project Director will meet monthly with the directors of the regional centers to review the progress and problems as discussed in the reports and to share information among centers. The monthly reports of all centers will be summarized and compiled in one document together with other information on Project progress and passed back to the regional centers in order to promote the flow of information among centers. Quarterly, SEAG will furnish reports to USAID on the overall progress of the Project.

B. Evaluation Arrangements

Evaluation is built into the Project design in a relatively straightforward manner.

Achievement of Project purpose will be evaluated through direct USAID monitoring and observation. SEAG's performance in carrying out the various Project components will be documented in monthly Project reports and by in-depth Mission management reviews as required.

Because of the relatively long implementation period and the institutional development nature of the Project, improvements in the design of various Project components most likely will evolve, thereby requiring

changes in the original Project planning. A joint SEAG-USAID formal review of the Project progress will be held at a mid point in Project implementation, approximately two years after first disbursement.

The review will consider SEAG's progress towards:

- establishing the seven (7) regional centers with forty three (43) services agencies (By the end of the second year after first disbursement, 27 agencies should be operating under five centers.);

- Increasing the use of mass media techniques (in accordance with targets to be established with technical assistance);

Widespread involvement of field technicians in pilot research activities (each of the 27 agencies participating in the second year should be carrying out three or more pilots).

- production of seeds and appropriate small farm mechanization implements under arrangements with SENASE and IAN (in accordance with targets to be set forth in operating agreements);

-enrollment of small farmers in the Farm Management activity (200 small farmers through the target area should be participating in the second year); and

- strengthening and streamlining SEAG's administrative procedures (as evidenced by timely payment of per diem and travel funds to agents, completion of scheduled procurement actions, etc.)

The joint review may determine needs for revised planning, specify future reviews, identify needs for short term specialized assistance, and result in other actions to improve Project implementation and evaluation. The material prepared for the review and the conclusions of the review will be documented in a report prepared by SEAG. At the end of the Project, SEAG will also prepare a report describing the accomplishments with respect to the performance criteria outlined above.

Achievement of the Project subgoal of increased delivery of new technologies will be measured continually by operational reports produced by each regional center. These reports will provide information on progress made towards increasing the efficiency of SEAG's operations, i.e. the number of farmers reached and the costs involved. They will also report on the status of technology packages under development or in use.

Achievement of the Project goal of increased small farmer welfare and income will be measured continually and directly through the Farm Management component of the Project. Each regional center will collect and analyze

the detailed information being generated. Initially, this activity will provide information on net farm income for certain key crops of the participating farmer. While crop enterprise accounting will only yield partial farm income figures, the initial and annual complete inventory taken in accordance with the established methodology will measure the resultant income flows for the whole farm operation. It will thus be possible to estimate for every farmer-participant: (1) change in the net worth of the farm operation, (2) increase in productive capacity (investment in productive assets), (3) growth of individual asset and liability accounts, and (4) changes in the relative importance of these accounts over time. The A.I.D. grant will provide SEAG with periodic short term technical assistance in implementing the Farm Management component. Gradual refinement of the indicators of whole farm income is expected as the Project continues. USAID may also use technical support to obtain TDY assistance in such specialties simple design in order to help to perfect the use of this activity for A.I.D.'s evaluation needs.

Additionally, in future years USAID may consider funding a farm survey in order to have a time series to follow up with its 1973 and 1976 small farmer surveys that provide detailed baseline information on farm income and practices. Similarly, it may be appropriate to finance case studies on small farmer adoption of technologies such as those developed in the mechanization component in order to help identify other Project impacts, including the nonincome welfare gains. These decisions may be made at a future time (perhaps during the mid-point joint review) depending on program needs.

C. Conditions, Covenants, and Negotiating Status

All Project elements have been developed jointly with the SEAG Director and his staff. The key features of Project design, including budget implications and location of operating and administrative responsibilities in SEAG, have been reviewed and approved by the Minister of Agriculture.

The budget implications are expected to be a crucial aspect of negotiations and will involve the GOP Minister of Finance. The Project, in an earlier form, was discussed with the Minister. These discussions resulted in the establishment of a line item in the approved 1978 budget providing GOP contribution in anticipation of the A.I.D. Project. Thus, even though little, if any, of these funds will be used in 1978, a mechanism already has been established within the budget process which reflects agreement in principle to the allocation of additional budget resources for the Ministry of Agriculture as contribution towards the proposed A.I.D. loan and grant financing.

In addition to the regular conditions precedent to disbursement under the loan, the Project Agreement will have special conditions to the

initial loan disbursement as well as to the first disbursement for certain Project elements. The Project Agreement also will require annual review of budget allocations subsequent to the first year as a condition for continuing local currency disbursements. Except for the appointment of a project director and a full time project administrator, all pertain to the A.I.D. loan funds only. While grant funded activities will be keyed to Project implementation progress, adequate control can be maintained through the normal Project management process. The suggested language of these special conditions follows below. (The language of the Draft Loan Authorization does not necessarily track the language set forth. This is intentional. The Authorization serves as a more general statement of required terms and conditions but should avoid prescribing details which may be subject to change during Project Agreement negotiation or Project implementation. The attempt here is to set forth an amplification of the requirements consistent with the terms of the Authorization.)

1. Conditions Precedent to Initial Disbursement (Except Technical Assistance)

Prior to any disbursement or the issuance of any commitment documents in respect of Loan or Grant funds (with the exception of long term technical assistance) the Cooperating Country (hereinafter referred to as the "Borrower") shall furnish to A.I.D., in form and substance satisfactory to A.I.D.:

a. Evidence of the appointment of a Project director and a full time Project administrator satisfactory to USAID.

b. A detailed Project Budget and Staffing Plan broken down by Project year and indicating the corresponding annual staffing requirements;

c. Evidence that adequate arrangements have been made to assure that Borrower contributions for the first year will be available.

d. A general operations manual that among other things will:

(1) summarize the institutional changes to be made in SEAG, reflecting the decentralization objectives of the Project;

(2) describe the Project's focus on the whole farm approach, the increased use of mass media, and the role of the regional rural development centers; and

(3) identify the detailed procedural and administrative manuals to be developed and assign responsibility for their preparation.

e. A time phased Project Implementation Plan.

2. Conditions Precedent to Disbursement for Grant Funded Technical Assistance

a. Prior to disbursement or the issuance of any commitment documents in respect of grant funds for long term technical assistance the Borrower shall submit to A.I.D. evidence of the appointment of a Project Director and a full-time Project Administrator satisfactory to A.I.D.

b. Prior to the disbursement or the issuance of any commitment documents in respect of grant funds for any particular technical assistance activity A.I.D. shall have approved a written contract for such activity.

3. Conditions Precedent to Specific Project Activities

Prior to disbursement or the issuance of any commitment documents in respect of Loan or Grant funds for the following specific activities, the Borrower shall submit to A.I.D., in form and substance satisfactory to A.I.D., the documentation described below:

a. For farm management activities, a detailed operating plan covering the first two years of activity and describing how implementation responsibility will be transferred to the SEAG regional centers.

b. For any training activity:

(1) a plan and corresponding operating manual for in-country training; and

(2) a standard form loan agreement to be signed by long term participants.

c. For local procurement of office equipment, furniture, supplies and other goods:

(1) evidence of appointment of directors satisfactory to A.I.D. for the first three regional centers; and

(2) copies of the procurement manuals to be used by SEAG in using Project funds.

d. For SEAG Project operating costs other than for farm management activities:

(1) the information necessary to demonstrate that the first three regional centers are ready to begin operations, including, but not limited to, appointment and training of key staff acceptable to A.I.D.; availability of office facilities, equipment and vehicles; and completion of an initial operating plan; and

(2) copies of the administrative manuals to be used by SEAG (respecting control and use of vehicles, including maintenance; control and use of fuel coupons; and management of per diem and other travel allowances) and other manuals necessary for the sound and timely implementation of the Project.

e. For the small farm mechanization activity:

(1) an agreement between SEAG and the Escuela Agro-Mecánica de Caacupé (EAMC) respecting implementation, including, but not limited to, the work to be performed by EAMC; the procedures and criteria for entering into sub-Agreements between EAMC and the regional rural development centers of SEAG; the financial and inkind contributions of both parties; and the payment mechanism; and

(2) evidence that arrangements have been made to assure adequate technical assistance to the EAMC in carrying out this work.

f. For the seed production activity, and agreement between SEAG and SENASE respecting implementation, including but not limited to, the nature of the work to be performed, the financial and in kind contributions of each party, procedures for entering into sub-agreements between SENASE and the regional rural development centers of SEAG for specific tasks to be performed; the payment mechanism; and SENASE's reporting and evaluation responsibilities.

g. For problem solving research activities to be carried out by entities other than SEAG, an agreement between SEAG and such entity respecting implementation, including, but not limited to: the criteria to be used in selecting the research to be performed; the procedures for assuring permanent coordination with the regional rural development centers; the financial and inkind contributions of each party; the payment mechanism; and the reporting and evaluation responsibilities of each research entity.

4. Conditions Precedent to Disbursement for Local Costs for Each Project Year (after First Year)

Prior to any disbursement or the issuance of any commitment document for local costs under the Loan for each Project year subsequent to the first year, Borrower shall, except as A.I.D. may otherwise agree in writing, provide:

a. a staffing plan, indicating the current staffing levels of SEAG, and the additions expected during the year;

b. evidence that there has been included in the National Budget an amount for the Project no less than that stipulated in the Budget Plan as Borrower's contribution for the Project year;

c. evidence that all funds for the Project so budgeted for prior years have been released for use by SEAG.

5. Required Covenants

The Borrower shall covenant, in addition to standard covenants, that:

a. The Borrower will authorize, or cause to be authorized, the new staff positions necessary to carry out the Project as planned with a salary structure adequate to attract and maintain qualified personnel in such positions.

b. The Borrower will maintain SEAG's operating budget in real terms at least at the level of the last year of the Project for at least 5 additional years or until A.I.D. and the Borrower agree otherwise.

PD

Department of State TELEGRAM

(1) AGR - Small Farmer Prop.

OFFICIAL FILE COPY

ACTION: PO

UNCLASSIFIED STATE 287526

Classification

(2) PRP - FCP

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E.O. 11652: N/A

TAGS:

SUBJECT: DAEC REVIEW - SMALL FARMER SECTOR PROGRAM PRP -- -- (LOAN/GRANT)

1. SUBJECT PRP WAS REVIEWED BY THE DAEC ON OCTOBER 28, 1976 AND INTENSIVE REVIEW WAS APPROVED. THE MAJOR CONCERNS AND CONCLUSIONS OF THE DAEC ARE PRESENTED HERE AS GUIDANCE TO THE MISSION FOR PP PREPARATION.

2. MINAG SALARIES. LOW SALARIES PAID TO MINAG PERSONNEL APPEAR TO BE A SIGNIFICANT CONSTRAINT TO THE EFFECTIVENESS OF MINAG IN ADDRESSING SMALL FARMER PROBLEMS, PARTICULARLY RESEARCH AND EXTENSION. INTENSIVE REVIEW SHOULD ADDRESS (A) THE STRATEGY WITHIN THIS PROJECT TO INCREASE AND MAINTAIN THE LEVEL OF SALARIES IN AGRICULTURAL RESEARCH AND EXTENSION; AND (B) THE IMPACT LOW SALARIES WILL HAVE ON THE REPLICATION AND CONTINUITY OF THIS PROJECT'S ACTIVITIES AFTER AID SUPPORT HAS ENDED.

3. COUNTERPART. IN VIEW OF THE FACT THAT THE GOP HAS HAD DIFFICULTIES MEETING ITS COUNTERPART OBLIGATIONS IN PREVIOUS AID LOANS, INTENSIVE REVIEW SHOULD FOCUS ON THE COUNTERPART PROBLEM AND SHOULD OUTLINE HOW THE MISSION WILL ENSURE THAT COUNTERPART FUNDS WILL BE FORTHCOMING.

4. MECHANIZATION. (A) THE DAEC VIEWS THE TRANSFER AND ADAPTATION OF EXISTING TECHNOLOGY AS A MORE COST-EFFECTIVE STRATEGY THAN DEVELOPING NEW TECHNOLOGY. INTENSIVE REVIEW SHOULD INDICATE HOW THE PROJECT WILL DRAW UPON ONGOING APPROPRIATE TECHNOLOGY EXPERIENCE (AND RESEARCH) BY INTERNATIONAL ORGANIZATIONS (E.G., INTERNATIONAL RICE RESEARCH INSTITUTE) AND OTHER NATIONS. (B) THE PP SHOULD DEMONSTRATE THAT A MARKETING INFRASTRUCTURE ALREADY EXISTS WHICH WILL FACILITATE THE PRODUCTION, DISTRIBUTION, AND PURCHASE OF APPROPRIATE MACHINERY AND EQUIPMENT AND SHOULD EXAMINE

Department of State **TELEGRAM**

THE AVAILABILITY OF ADEQUATE FUEL, SPARE PARTS AND SERVICE FACILITIES FOR MACHINERY, (C) INTENSIVE REVIEW SHOULD INVESTIGATE TO WHAT EXTENT THE LACK OF CREDIT IS LIKELY TO BE A CONSTRAINT ON THE ADOPTION OF NEW TECHNOLOGY FOR BOTH THE SMALL FARMER (FOR ITS PURCHASE) AND FOR THE MANUFACTURER (TO FINANCE PRODUCTION AND INVENTORY COSTS). (D) THE PP SHOULD DEMONSTRATE THE AVAILABILITY OF SUCH CREDIT EITHER THROUGH THIS PROJECT OR THROUGH THE PCGP, RURAL ENTERPRISES LOAN OR SOME OTHER FORM OF FINANCING. (E) FARMER"' ATTITUDES TOWARDS CAPITAL INVESTMENTS WILL ALSO HAVE A DIRECT IMPACT ON BOTH THE PROJECTED DEMANDS FOR CREDIT AND THE DEMAND FOR IMPLEMENTS AND MACHINERY AND THE PP SHOULD TREAT THIS CONCERN.

5. SEED DISTRIBUTION SYSTEM. THE DAEC QUESTIONED THE ADEQUACY OF SENASE'S SEED DISTRIBUTION SYSTEM, ESPECIALLY IN REGARD TO THE ACCESSIBILITY OF QUALITY SEEDS TO THE SMALL FARMER AND THE INDIVIDUAL FARMER'S WILLINGNESS AND ABILITY TO PURCHASE SEEDS. EITHER THROUGH THE ONGOING SURVEY OR THROUGH SOME OTHER SIMILAR METHOD, THE PP SHOULD ADDRESS THE DISTRIBUTION ISSUE AND EXAMINE ITS EFFECT UPON THE VIABILITY OF SENASE'S OUTREACH PROGRAM TO THE SMALL FARMER.

6. TRAINING. THE DAEC QUESTIONED THE COST-EFFECTIVENESS OF THE PROPOSED TRAINING PROGRAM. THE LEVELS OF PROPOSED M.S. AND PH.D. TRAINING SHOULD BE JUSTIFIED IN LIGHT OF THE NEEDS OF THIS PROJECT. WILL THESE TRAINED PERSONNEL BE DEPLOYED IN THE FIELD WHEN THERE IS A LACK OF PROFESSIONAL PERSONNEL WITHIN THE MINAG? FURTHERMORE, INTENSIVE REVIEW SHOULD ADDRESS THE PROBABILITY OF RETAINING HIGHLY TRAINED INDIVIDUALS IN FIELD RESEARCH POSITIONS VIS-A-VIS LOSING THEM TO THE MINAG'S CENTRAL OFFICE OR TO PRIVATE INDUSTRY AND INTERNATIONAL ORGANIZATIONS.

7. INSTITUTIONAL DESIGN. THE DAEC QUESTIONED THE RATIONALE OF THE SMALL FARMER RESEARCH INSTITUTE (SFRI) FIELD RESEARCH TEAMS PROVIDING A LINK BETWEEN THE MINAG'S PRESENT RESEARCH STATION AND EXTENSION SERVICE ACTIVITIES. QUESTIONS WERE RAISED AS TO WHETHER THE PROJECT DESIGN WAS AVOIDING A MINAG PROBLEM WHICH SHOULD BE SPECIFICALLY ADDRESSED, I.E., THE EFFECTIVENESS OF THE RESEARCH STATIONS AND THE EXTENSION SERVICE IN THEIR PRESENT FORM. DOUBTS WERE RAISED BY THE DAEC AS TO THE APPROPRIATENESS OF CREATING AN ADDITIONAL RESEARCH ENTITY INSTEAD OF BUILDING ON AN EXISTING STRUCTURE. THE MISSION SHOULD EXAMINE THE INSTI-

Department of State **TELEGRAM**

TUTIONAL DESIGN OF THIS PROJECT IN THE PARAGUAYAN CONTEXT. THE PP SHOULD INCLUDE A COMPREHENSIVE LAYOUT OF THE PROPOSED INSTITUTIONAL ARRANGEMENTS PARTICULARLY THE LINKAGES BETWEEN RESEARCH STATION AND SFRI ACTIVITIES AND DISCUSS THE IMPLICATIONS OF THE DESIGN FOR THE SMALL FARMER.

8. TECHNICAL ASSISTANCE. THE MISSION SHOULD EXAMINE THE POSSIBILITY OF LOAN FUNDING THE PROPOSED TECHNICAL ASSISTANCE PACKAGE. THE PP SHOULD MAKE A STRONG CASE FOR GRANT FUNDING IF IT IS THE MISSION'S JUDGMENT THAT LOAN FUNDING IS NOT FEASIBLE. THE TA SHOULD BE PROJECTED FOR THE FIVE-YEAR LIFE OF THE PROJECT TO ENSURE RESEARCH AND ADMINISTRATIVE CONTINUITY.

9. OTHER MISSION ACTIVITIES. THE PP SHOULD RELATE THIS PROJECT'S ACTIVITIES TO THE EFFORTS OF ONGOING AND PROPOSED PROJECTS TO AVOID DUPLICATION AND OVERLAPPING. THIS WILL ENSURE THAT ALL EFFORTS ARE COMPLEMENTARY AND THAT THEIR SYNERGISTIC EFFECT WILL PRODUCE ADDITIONAL GAINS.

10. BASED ON THE MISSION'S INITIAL ENVIRONMENTAL EXAMINATION, THE AA/LA HAS REACHED A THRESHOLD DECISION FOR THIS PROJECT INDICATING A NEGATIVE DETERMINATION. ROBINSON

AID 1020-2B (3-71)
SUPPLEMENT I

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

(INSTRUCTION: THIS IS AN OPTIONAL FORM WHICH CAN BE USED AS AN AID TO ORGANIZING DATA FOR THE PAR REPORT. IT NEED NOT BE RETAINED OR SUBMITTED.)

Life of Project:
From FY 1978 to FY 1982
Total U.S. Funding $6,000,000
Date Prepared: April 20, 1978

Project Title & Number: Small Farm Technology 526-0109

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: To increase the welfare and net income of small scale farmers in Paraguay	Measures of Goal Achievement: Average per hectare farm yields in Project area at least match national averages and income increases of 3% per annum in real terms attained by farm families that adopt one or more new technologies promoted by SEAG.	USAID and MAG estimates of yields and small farmer income, based on: Cross Section Analysis - income estimated based on field research comparisons of current versus new technologies, and farm records started under the farm management project. Time Series - subsequent small farmer surveys compared with 1973 and 1976 survey data.	Assumptions for achieving goal targets: 1. Credit and market constraints can be sufficiently overcome through region level planning and coordination. 2. World market prices for Paraguayan agricultural exports remain favorable.
Project Sub-Goal: To increase the delivery of technology packages responsive to the needs of Paraguay's small scale farmer.	1. 50,000 small farm families being reached directly and indirectly by SEAG. 2. Each regional center working with at least 10 new technology packages at the end of each year.	SEAG operational reports and records	1. SEAG Management remains committed to increasing the use of mass media and other low cost group approaches. 2. Collaborative approach between SEAG and other agricultural sector entities is feasible as a result of Project design.

AID 1020-18 (7-71)
SUPPLEMENT I

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 1978 to FY 1982
Total U.S. Funding $6,000,000
Date Prepared: April 20, 1978

Project Title & Number: Small Farm Technology 526-0109

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Purpose: To enable SEAG to identify technology needs of small farmers and to respond efficiently and effectively to these needs.	Conditions that will indicate purpose has been achieved: End of project status. Seven local technology delivery networks operating under Project concept, including the widespread use of: (a) pilot research activities to test out and/or demonstrate new crops and cropping systems; (b) Group or collective approaches; (c) Local radio, pamphlets, photo novels and other mass media techniques; (d) feedback and evaluation systems based on farm management record keeping. (e) local level coordination with credit agencies. Operational linkages established between SEAG and: (a) the Agro-Mechanical School of Caacupé; (b) SEMASE; and (c) IAN and other research entities	1. SEAG operational reports 2. Reports of Long-term advisors to SEAG; 3. Appraisals and subjective opinions of short term consultants.	**Assumptions for achieving purpose:** 1. Project Agreement is sufficiently flexible to permit minor design modifications when warranted. 2. Local SEAG field agents enthusiastically respond to greater responsibilities and access to resources permitted by Project. 3. SEAG continues to be accepted by target farmers as a technically oriented organization without political objectives.

AID 1820-2a (7-71)
SUPPLEMENT I

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 1978 to FY 1982
Total U.S. Funding $6,000,000
Date Prepared: April 20, 1978

Project Title & Number: Small Farm Technology 526-0109

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Outputs:	**Magnitude of Outputs:** Year 1 / Year 2 / Year 3 / Year 4		**Assumptions for achieving outputs:**
1. Within SEAG:	1.		
A. Establishment of fully equipped local delivery networks with semi-autonomous management responsibility	A. 3 / 2 / 2 / -	USAID and SEAG Reports	A. Field personnel support reorganization
B. Increases to staff related to Project:	B.		
Home Office (30)	6 / 11 / 9 / 4		B. SEAG Director can classify positions at high enough level to attract and retain qualified personnel.
Regional Centers (94)	12 / 36 / 27 / 19		
Satellite Agencies (42)	10 / 12 / 12 / 8		
C. Training	C.		
In country courses	10 / 11 / 11 / 11		
Short term participant travel	10 / 5 / - / -		
Long term training initiated	- / 3 / 3 / 2		
D. Production of Mass Media Devices	D. Targets to be established with Technical Assistance financed under Project.		D. Qualified long term advisor can be hired and on board during first year.
2. Outside SEAG	2.		2.
A. Fully equipped and operating small farm machinery shop adapting and/or building prototypes.	A. (Number of prototypes) - / 10 / 20 / 30		A. At least 2/3's of prototypes tested will be successful and replicated by farmers and/or local shops.
B. National Seed Service producing certified seed in support of SEAG regional centers	B. No. of Varieties - / 3 / 3 / 9		B. SEAG Regional Centers can identify specific needs at end of first year of each center.
C. Results of research on new crops and cropping systems made available to SEAG	C. (Number of Reports published on new crops or cropping systems) - / 1 / 5 / 6		C. Researchers willing to release results to SEAG without extensive testing

AID 1020-26 (9-71)
SUPPLEMENT I

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 1978 to FY 1982
Total U.S. Funding $6,000,000
Date Prepared: April 20, 1973

Project Title & Number: Small Farmer Technology 526-0105

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Inputs: (000s)	Implementation Target (Type and Quantity)		Assumptions for providing inputs:
A.I.D.: Loan $5,000. Grant 1,000. GOP 3,657.2 Total $9,657.2 A.I.D. loan SEAG: - Operating Costs $1,251.2 - Procurement of Goods 1,682.3 (Vehicles, printing & Com. equipment, Other) Small Farmer Mechanization $ 319.1 Improved Seeds 450.0 Directed Research 180.0 Training 44.4 T.A. and Consultants 201.0 Administration 72.8 Adjustment for Inflation 411.2 A.I.D. Grant $1,000. Long term advisors 500. Short term specialist 270. Training 55.2 Adjustment for Inflation 114.8 GOP $3,657.2 SEAG Budget Increments of: operating costs $1,043.6 Incremental Project related salaries $1,899.3 Adjustment for Inflation 713.3		Mission Reports and GOP Budget records	

ANNEX III

TECHNICAL FEASIBILITY

CONSTRAINTS ADDRESSED BY PROJECT

The proposed project is based upon well established principles for disseminating and utilizing new knowledge of technology. The need to decentralize government services is widely accepted just as there is universal recognition that hybrid seeds are necessary to increase yields. Consequently only one of the Project components, small scale mechanization, is discussed at length in the technical section. (Consult Unattached Annex B in the LA/DR bulk files for additional mechanization subproject details.)

1. Need for New Technology Among Small Farmers

"Technology" is the way in which farmers combine their available resources--capital, labor, and land--to produce crops and livestock. More productive or more efficient technologies are referred to as "new" technologies. Further, when this PP refers to "new" technologies it is in fact referring to technologies that are generally untried throughout Paraguay. Chances are that "new" innovations introduced by the proposed project will, in fact, be economically feasible techniques that have been used elsewhere. The Project will maximize lessons learned from international research centers such as IRRI, CIMMYT, IITA and CIAT, among others. Outside technical assistance is being given emphasis in the grant portion of this Project precisely to prevent rediscovering existent technologies.

One measure of technological change is the increase in agricultural production that cannot be accounted for by increased use of basic resources. In the case of U.S. agriculture, $29 billion of additional labor, land, and capital resources would have been required to obtain 1970 production had it been achieved using 1939 methods. This savings may be attributed to improved quality (level of training) of the work force and the utilization of more productive technologies.

Although there is no comprehensive analysis available for Paraguayan agriculture, the evidence suggests that increases in total agricultural output have been the product of increased use of basic resources, not new technologies. There is an extremely close relationship between increased production and the amount of land cultivated on one hand, and little change in yields per hectare on the other (See Table 1). Further, the productivity of agricultural labor appears to be extremely low in Paraguay* and

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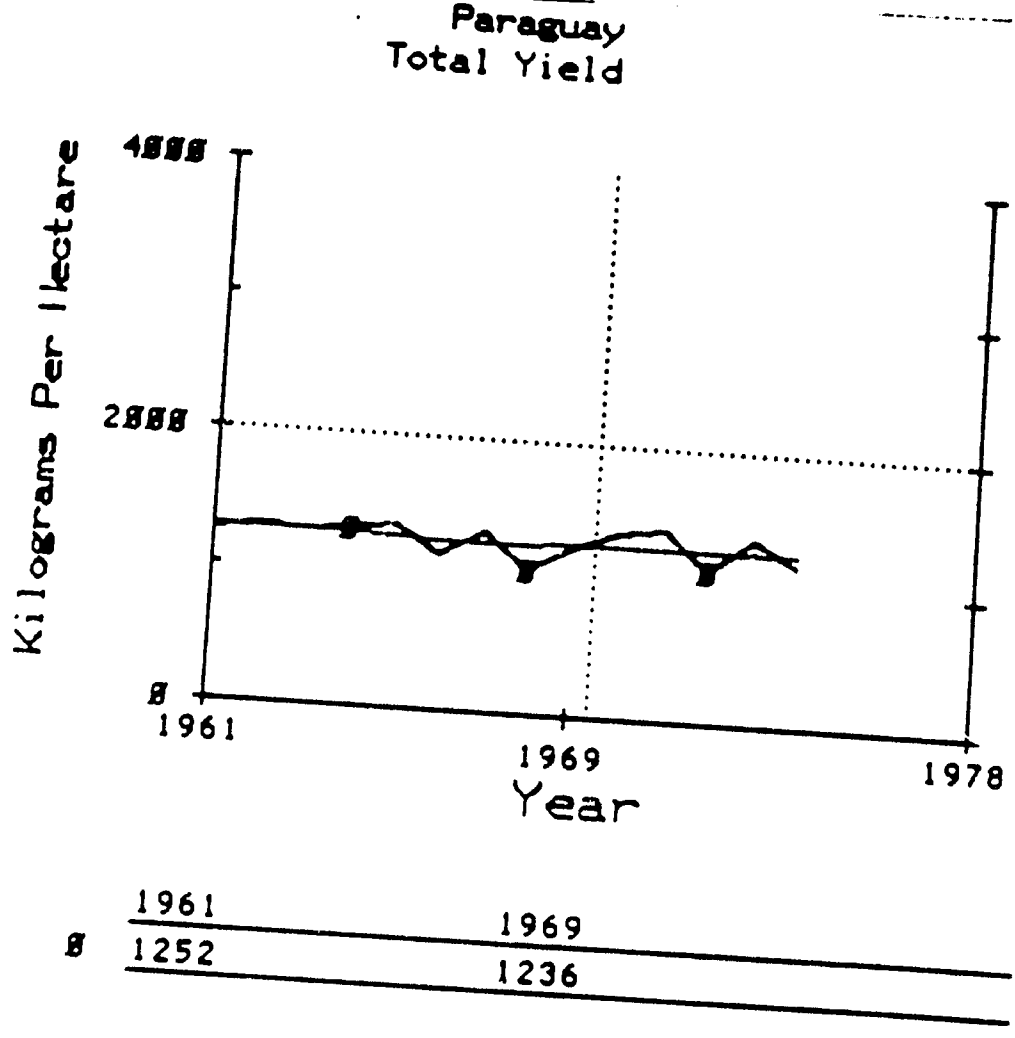
* Approximately one-half the average output per agricultural laborer in Latin America.

TABLE 1 : Production, Area Harvested, and Yields for Major Crops, 1961, 1970,1973, 1976

		Total Production (1,000 MT)	Total Land Area (1,000 Has.)	Average Yield (Kg.)
CORN:	1961	206.3	171.4	1,200
	1970	258.7	187.4	1,380
	1973	246.0	185.6	1,326
	1976	370.5	285.0	1,300
WHEAT:	1961	11.0	13.4	800
	1970	31.4	34.3	914
	1973	23.0	20.3	1,132
	1976	25.3	28.5	1,124
RICE (Irrigated)				
	1961	31.7	15.2	2,100
	1970	45.2	22.9	2,100
	1973	33.9	15.7	2,151
	1976	40.6	17.1	2,374
SOYBEANS:	1961	2.4	2.1	1,100
	1970	52.1	39.7	1,311
	1973	122.5	81.4	1,508
	1976	272.6	169.9	1,604
COTTON:	1961	27.2	35.4	800
	1970	39.6	46.9	844
	1973	85.3	81.1	1,051
	1976	112.1	115.0	975
TOBACCO:	1961	13.4	10.0	1,300
	1970	17.7	13.5	1,312
	1973	26.7	20.4	1,310
	1976	38.6	27.9	1,380
SUGAR CANE:	1961	863.1	28.7	30,000
	1970	972.6	26.0	37,000
	1973	758.9	17.7	42,860
	1976	787.7	20.7	37,920
MANDIOCA:	1961	1,510.5	112.0	13,400
	1970	1,782.2	127.3	14,000
	1973	1,107.9	79.6	13,938
	1976	1,573.3	106.5	14,773
BEANS:	1961	36.6	52.6	696
	1970	34.9	54.4	641
	1973	34.2	43.4	788
	1976	52.3	66.8	783

has increased at only 1.2 percent per annum in recent years. Thus, most of the expansion in agricultural production is due to additional employment of traditional inputs. Graph 1 was generated by the Population and Energy Group Computer (which has a terminal in the AID/W offices) and demonstrates the lack of any sustained growth in total yields per hectare in Paraguay during the last 15 years. The data used to generate the graph came from Ministry of Agriculture sources.

GRAPH 1



If in the aggregate technology change has not had a significant impact upon production, does there exist for small farmers unexploited technological alternatives (due perhaps to lack of credit or technical assistance). It is

recognized that in the Paraguayan agricultural sector more productive alternatives exist for cotton and tobacco than for crops such as corn, mandioca, and beans which are predominantly grown by small farmers. See the analysis in the Small Farmer Subsector Assessment (pp.221-22)

The small-farm agricultural subsector of Paraguay, is of a fairly homogeneous nature technologically. The sharp contrasts between traditional versus modern agriculture sectors, characteristic of dual economies, are observed. (p. 243 Small Farmer Subsector Assessment). Farm size is apparently not a factor in the use of different technologies, though larger farms would be expected to have greater access to credit and technical assistance.

The following observations can be drawn from the Small Farmer Sub-Sector Assessment.

1. Output:

   a. Based upon available data, there appear to be no significant differences in crop yields (corn, mandioca, cotton and beans) according to size of farm (pp. 183-184);

   b. The value of production of annual crops per hectare does not vary with farm size (pp.200).

2. Capital Input:

   a. The value of capital per hectare by size of farm in implements and permanent structures does not suggest that larger farms utilize more capital intensive production (p. 178);

   b. Annual expenses per hectare are inversely related to farm size, reflecting a higher percentage of area devoted to crops on small farms (p. 175);

   c. There is relatively constant ratio of gross farm income to annual expenses indicating a minimum level of purchased inputs on farms less than 20 hectares in size (p. 454);

   d. Wages for hired labor are nearly a constant proportion of annual expenses over all sizes of farms (p. 454).

3. Labor:

   a. Labor income (payment to labor after deducting capital costs and land rent) is inversely related to farm size, reflecting lower percentage of land utilization.

All of this suggests that there are few existing technological alternatives from which small farmers can benefit, and increases in income must otherwise derive from increased application of labor, land, and capital in more or less fixed proportions. The percent of available land cultivated declines rapidly with increased farm size, and it appears that income is constrained by farm size only for the smallest farms. Under current technology, farm families can operate about six hectares using primarily family labor resources. Further, the amount of land cultivated on larger farms suggests that it is not economic to use major amounts of hired labor. Given the low productivity of agricultural labor (associated with low technology levels), a reluctance to hire labor--except for critical periods such as harvest--would appear to be consistent with rational economic behavior.

In summary, if under existing technology, family labor is an important limitation to increased production and income, and if capital is related in relatively fixed proportions to the labor and land, there is a definite need to seek more productive combinations of these resources (new technology) in order to increase small farmer incomes.

The selection of the technology constraint for a major AID input at this time is based on USAID's conviction--shared by the Ministry of Agriculture--that the lack of appropriate technology packages, and the capacity for generating them, must be overcome if other small farmer development programs are to reach their full potential.

2. Project Rationale

An underlying concept of the Project is that well staffed and funded regional rural development centers can be instrumental in making Paraguay's research and extension effort much more responsive to small farmer needs.

As explained earlier, the centers are to be based in small farmer areas where they are in constant contact with their clientele. This opportunity for close observation of small farm practices and the development of an empathy with small farmers is not afforded the researcher working on the experiment station. Consequently, the staff should achieve both a thorough understanding of small farmers and the orientation necessary to create technology adapted to their needs.

The philosophy of the project approach begins with the premise that small farmers use their current practices for good and understandable reasons, and it is necessary to understand the rationale for current practices as a first step toward creating more productive alternatives. Second, the burden of proof of the value of an alternative technology is whether it increases small farm incomes. In this sense, the new technology is to be considered superior to existing practices only if it contributes to greater income from the total mix of activities undertaken by the farm enterprise. Consequently, each center must consider the economics of any new practice proposed, how it fits within present cropping patterns and livestock production activities, how it relates to the resources limitations and the market opportunities faced by small farmers. In short, the orientation is not toward improving the productivity of a given commodity, but toward seeking ways to increase the productivity of

the whole farm enterprise.

Finally, there will be no distinction between the conditions under which research is accomplished and those faced by small farmers, because research will be conducted on the small farmers' own land. In fact, because a prominent part of their activities will be to test promising alternatives under small farmers' own management, it assures that they are capable of handling the new practices being evaluated.

The operational plans for the centers will be developed in collaboration with local extensionists who will contribute their suggestions of possible solutions to be evaluated. The plans will also benefit from experiment station research ideas of what technologies should be extended and how to best transmit this information to the agents who will be responsible for diffusing this information. Through this approach it is believed that the coordination of research and extension will be greatly facilitated, and small farmers will benefit by a flow of proven technologies. The effectiveness of this approach of course, cannot be proven a priori. Nevertheless, the GOP is willing and eager to put into practice the required operational modifications.

3. Mechanization Program

In order to exploit the income opportunities presented to a large proportion of Paraguay's small farmers through more extensive utilization of their land resources, mechanical technologies must be sought which will increase the output of farm labor. Only the smallest farms--five hectares or less--approach utilization of 80 to 100 percent of their available land for cropping purposes, while farm units of five to 10 hectares and 10 to 20 hectares average 60 and 41 percent respectively of their land devoted to crop production. Although various reasons might be suggested to explain this phenomenon, small differences in area under cultivation over such a substantial range of farm size strongly indicate that present technologies limit the capacity of family labor to expand crop production. Even if one were to suggest the application of additional hired labor as a means of bringing greater land area under cultivation, the present patterns of production would argue that such an approach is not viewed as economic by small farmers.

At the same time, small farmers are not in a position to adopt the tractor technology employed in capital intensive agriculture. Further, the high cost of imported equipment and fuel to operate them suggests that the size of farm required to economically justify mechanization based upon even a modest sized tractor (as viewed in terms of U.S. commercial agriculture) may be substantially larger than encountered in other countries. Consequently, what is required is an appropriate mechanical technology, one which fits the particular labor and capital resources encountered among Paraguayan small farmers.

Presently, there is considerable world-wide interest in "intermediate" or "appropriate technology". Schumacher, the founder of the Intermediate Technology Group in England, suggests that "the appropriate tool is neither primitive nor hopelessly sophisticated." His Group, along with an A.I.D. sponsored project at the International Rice Research Institute in the Phillipines, the Overseas Department of National Institute of Agricultural Engineering in England, Volunteers in Technical Assistance (VITA), and others have catalogued, tested, designed and promoted various designs of less sophisticated machines which have applicability to small farms in developing countries. In a real sense these efforts do not represent a vehicle for direct improvement of mechanical technology in Paraguay. The existence of a suitable design somewhere in the world, although an invaluable resource, does not imply a meaningful technological alternative for the Paraguayan small farmer. Somehow local needs for mechanical technology must be assessed, designs applicable to these needs located or developed, such designs tested under small farm conditions, and finally, these machines made available to small farmers. Only when this can be accomplished will intermediate technology have an impact in Paraguay.

Consultants[1/] to the Project suggested the following parameters be considered in evaluating whether attention should be given to mechanizing a particular farm operation:

(1) Labor bottlenecks--when labor bottlenecks appear in the crop calendar, mechanization can often overcome such temporary labor shortages.

(2) Timeliness of operation--in the cultivation of most crops there is an ideal period for each element of husbandry if optimum yields are to be obtained.

(3) Practicability--such factors as ease of repair, sensitivity of performance to maintenance and the probable cost of the implement under consideration should be evaluated.

(4) System compatibility--is the proposed machine usable within the farming system currently employed. (Example: animal drawn cultivators are incompatible with farming systems where uniform row width is not utilized or crops are interplanted.)

1/ Larson, G.H. and J.K. Campbell, "Recommendations for the Development of Agricultural Machinery Suitable for Small Farmers", unpublished manuscript, March 1977.

Once a proven prototype is available, a number of additional steps are required before these new machines are utilized by small farmers (as noted by the DAEC review). These steps can be itemized as follows:

1. Manufacturers must be located.
2. Financing will be required for these manufacturers.
3. A distribution system for machinery and spare parts must exist or be established.
4. Credit should be available to small farmers for purchase of machinery.
5. The small farmer must be prepared to invest capital in machinery.

Recent studies[1/] have identified a number of metal working firms, of varying degrees of sophistication, capable of making small machinery and implements. One such firm indicated that it was prepared to build tractors in the 10 to 15 horsepower range. There is reasonable distribution of such firms in major centers about the country, although the greatest concentration is, of course, in Asunción. In short, it is believed that there will be little difficulty in finding firms interested in the manufacture of small equipment. These firms do, however, face certain problems associated with the manufacture of small machinery. Typically they are concerned about financing, sufficient demand to permit volume production, and importation of raw materials.

With respect to financing of manufacturers, the Rural Enterprises Loan specifically provides for financing of firms intending to produce farm inputs. In addition, this question was addressed to the National Development Bank (BNF), which indicated that it would be favorably disposed to financing this type of investment through a line of credit for agro-industry being developed under a proposed World Bank loan. Finally, CREDICOOP actually financed the production, inventory, and credit union member purchase of ox drawn sprayers and has expressed its interest in continuing to assist with a mechanization effort among its members.

Thus, there appear to be lines of credit available for potential manufacturers of small machinery. The adequacy of the amounts available from these lines of credit and the timeliness of such credit is of some concern. At least there would appear to be sufficient amounts of credit from the Rural Enterprise Loan to initiate such activities. It should be recalled that intermediate credit institution projects are among the least complicated type to develop should early indications suggest that additional

1/ Morales, George, "Interim Report, Paraguay Rural Enterprises Loan", unpublished USAID document, March 19, 1976.

external resources will be required to support an expanding production of small machinery. The timeliness of credit to potential manufacturers can hopefully be assured by the time proven prototypes begin to emerge from the Project. The flow diagram of the mechanization subproject on the following page shows how manufacturers will be expected to interact with other elements in the project. In order to assure that this subproject will be carefully coordinated, EAMC personnel, the SEAG project director and the USAID will submit annual work plans identifying which prototypes are to be developed by the program. This will eliminate needless duplication with prototypes developed in other countries and will assure that prototype selection is carefully monitored.

The question of sufficient demand to allow volume production is related to (1) the economic value of the machine as viewed by the farmer, (2) his capacity to finance it, and (3) the degree to which a distribution network exists or can be evolved to reach large numbers of farmers.

The distribution system for small machinery and spare parts is more difficult to treat than financing of manufacturers. It is the Mission's contention that the private sector will have the capacity to evolve a distribution system for small machinery and spare parts. The BNF imported and distributed small machines--animal drawn plows, cultivators, one-row planters and other tillage implements--in the past. Their present policy is to continue to finance such machinery, but not serve as distributor. To make this policy effective they intend to be supportive of private sector entities who may wish to undertake this responsibility. One potential basis for a distribution system is the cooperative movement. CREDICOOP is best organized to perform such a function and indeed, has underway efforts to assist its credit union members to procure and distribute machinery for their small farmer clientele. At least a few small farmer cooperatives outside of the CREDICOOP system have also become involved in supplying their members with small machinery[1/]. In addition to the cooperatives, the existing distributors for large farm machinery could add a line of small implements at such time as supply and demand for such machines suggest to them an economic activity, since small farms and large farms (especially in colony areas) can be found to exist in the same geographic areas. Further, there are small stores in every rural community which supply basic necessities, some dry goods, and a limited line of hand tools which could probably secure equipment for interested buyers on an order basis and stock some repairs (cultivator shovels, plow points, hose, bolts and nuts) for commonly used machines. This order basis approach could be facilitated by the extension service through demonstrations of various machines (substituting for the selling function normally performed by a distributor) which would allow small farmers to see first hand this equipment in operation. Finally, the metal working firms located at various points in the country could serve as local distributors of the implements they produce.

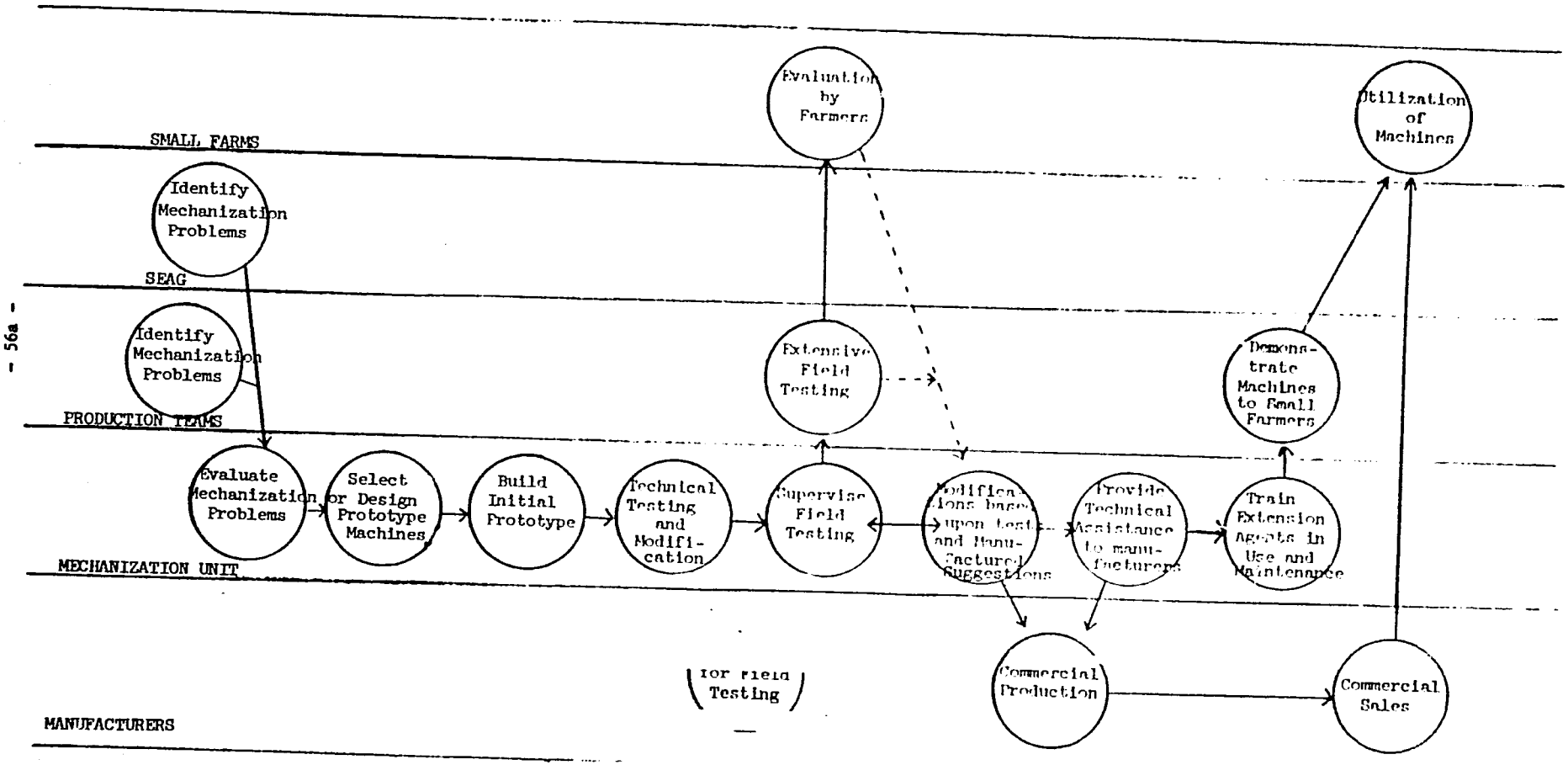
The availability of fuel will figure importantly in the choice of mechanical technology to be developed. Since gasoline and diesel fuel are very expensive, one would expect that the economics of mechanization will dictate

1/ Cooperativa Itacurubí del Rosario purchased 50 cultivators, 20 plow (animal traction) and 10 seeders for resale to their members in July 1977.

1) Flow chart - Mechanization

ANNEX
M-1

SCHEMATIC VIEW OF FUNCTION OF THE MECHANIZATION EFFORT



heavy emphasis upon animal drawn and hand operated machines. There is, however, a reasonable number of outlets for fuel in Eastern Paraguay.

Project designers are so sensitive to the high cost of gasoline in Paraguay that they elected to procure diesel vehicles for the SEAG regional network. Two studies of the merits of gasoline powered versus diesel powered vehicles concluded that diesel vehicles were far cheaper for Paraguay. At least 21 percent will be saved by using diesels even though initial purchase costs may be somewhat higher. Also, pickup vehicles were selected by SEAG because it was felt they would have greater flexibility to haul materials to project sites.

The main suppliers of small farmer credit--BNF, CREDICOOP, and CAH (Crédito Agrícola de Habilitación)--were asked to address the question of credit to purchase small machinery. In each case they responded positively to the idea of financing machinery adapted to needs of small farmer clientele. The major problem encountered is that formal credit institutions reach a small proportion of the nation's small farmers (1976 estimates indicate approximately 8,300 BNF clients, 6,000 small farmer members of CREDICOOP, and 3,295 farmers provided credit through CAH). With the cooperation of the Extension Service, BNF is encouraging the formation of "producer association", consisting of 10 to 20 neighboring farmers, who will apply for credit as a group in order to facilitate greater coverage among small farmers and reduce the administrative burden of small loans. CREDICOOP is now utilizing the US$3.0 million provided by a recent A.I.D. loan for expansion of their credit activities. These represent efforts on the part of formal credit institutions to increase credit services to small farmers. In summary, there is a willingness on the part of credit institutions to finance small machinery and efforts are being made to address the problem of the limited number of small farmers receiving credit from formal credit sources.

Most people in Paraguay believe that small farmers respond to economic opportunities and their reaction to capital investment in machinery would not be different from the response to any opportunity to improve their income. To evaluate this hypothesis, data from the 1972/73 and 1976 Small Farmer Surveys can be examined.

Data on the number of oxen, horses, and small implements, based upon a very limited subsample of farmers interviewed in the 1972/73 Survey are presented in Table 2. These data suggest nearly every one of the farms in this subsample above five hectares owned a team of oxen, a cart, a sprayer or duster, and a plow. Farms of less than five hectares were much less likely to have a team of oxen or implements. Although the sample is extremely small, these data suggest that a typical farmer with between five and ten hectares would have had approximately US$700 in capital value in oxen and

TABLE 3

IMPLEMENTS AND DRAFT ANIMALS ON TWENTY-FOUR FARMS IN THE ITACURUBI DE LA CORDILLERA DISTRICT: NUMBER AND VALUE BY SIZE IF FARN (SIX FARM PER GROUP), 1972/73 SURVEY

	Number of Implements or Animals				Average Value (US dollar equival.)			
	0-4Ha.	5-9 Ha.	10-16 Ha.	17-27 Ha.	0-4 Ha.	5-9 Ha.	10-16 Ha.	17-27 Ha.
Oxen or bulls	2	11	16	27	278	216	211	152
Horses	3	6	3	5	48	48	56	94
Carts	1	4	4	5	158	131	101	130
Steel plow	1	5	2	9	32	33	24	27
Harrow	-	3	-	4	-	19	-	25
Seeder	1	-	1	-	48	-	4	-
Sprayer or Duster	1	4	3	5	32	72	48	26
Weeder/Cultivator	2	4	1	2	30	26	24	26

pp. 216-21: Small Farmer Sub-Sector Assessment

TABLE 2

IMPLEMENTS AND DRAFT ANIMALS ON SMALL FARMS IN EASTERN PARAGUAY: PRELIMINARY DATA FROM 1976 SURVEY

	Percent of Farmers with Animals or Implements				Average Value (US dollar Equiv.)			
	0-4.9 Ha.	5.0-9.9 Ha.	10-20.9 Ha.	20-50.9 Ha.	0-4.9 Ha.	5.0-9.9 Ha.	10-20.9 Ha.	21-50.9 Ha.
Oxen (used in land preparation)	60	66	36	45	--	--	--	--
Horses (used in land preparation)	4	5	5	3	--	--	--	--
Tractors	--	--	1	1	--	--	6,084	15,873
Carts: Ox	14	34	31	40	214	254	206	206
Horse	3	8	11	11	151	246	230	222
Wooden plow	8	22	19	25	16	8	8	8
Steel plow	23	51	30	47	63	63	63	87
Spike drag	3	11	5	11	32	32	40	40
Seeder	--	4	3	4	--	63	63	16
Backpack sprayer	4	22	19	25	48	254	63	48
Cultivator	3	11	8	12	32	40	63	40
Disk	1	4	4	9	87	222	230	325
Percent of Farms with implements	34	68	55	61				
Percent with more than 3 implements	4	22	14	26				

implements. Further, one might expect to encounter ox teams and implements on at least a few of the farms smaller than five hectares. An interesting sidelight is that the average unit value per machine varies little by farm size suggesting that the mechnical technology employed is much the same across a wide range of small farms.

Table 3 presents preliminary data from the 1976 Survey. The data are representative of all of Eastern Paraguay, and present a somewhat different view of the mechanization situation than the data presented earlier. About two-thirds of farms under ten hectares have oxen, while this percentage decreases substantially for farms above ten hectares. A substitution of tractor power for animal power does not appear to be an explanation for this finding. The most reasonable guess is that farms of over ten hectares include a number of colonists who do not yet have sufficient resources to acquire a team of oxen and implements. One finds it unlikely, except for a plow, that implements will be encountered on farms of less than five hectares. Above five hectares there is little variation by farm size in the percent of farms having various implements. Also there is little difference in the percentage of farms with more than three implements by farm size. A farm with a team of oxen, an ox cart, a steel plow, and backpack sprayer--the most likely combination of equipment--would appear to have about US$800 in capital investment in power and implements.

This evidence suggests that appreciable percentages of small farmers in Paraguay have invested in power (oxen) and implements. This would lend credence to the generally accepted conclusion that small farmers will purchase machinery which represents an economically sound investment within their scale of operations.

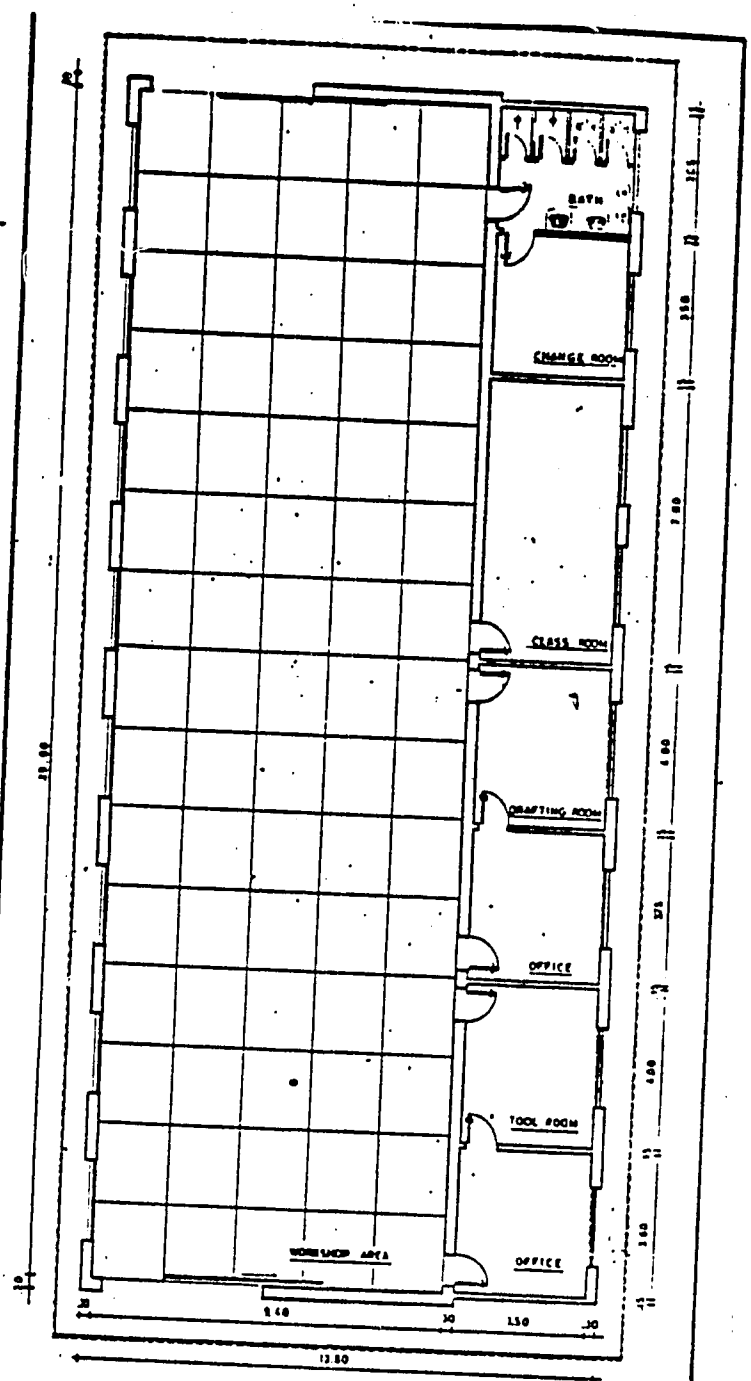
4. Engineering Assessment of the Building Housing the Mechanization Subproject

From the outset USAID engineers have assisted in planning the small building which will house the prototype development program. The following, which meets the USAID engineer's technical specifications, is the plan for the building. Unattached Annex B contains even further detail, especially (1) a description of the Agro-Mechanical School at Caacupé, (2) a detailed list of equipment to be used at the Agro-Mechanical School, and (3) Diagrams and descriptions of prototypes of Potential Usefulness to Paraguayan Farmers.

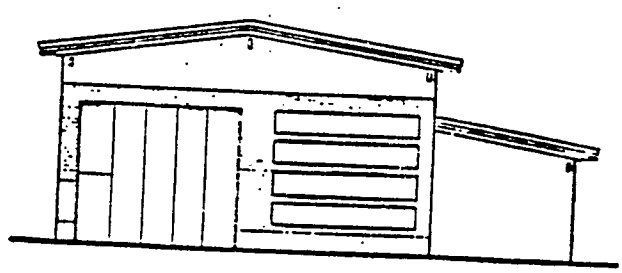
The new workshop building will be 30.0 x 13.8 meters (98'-5" x 45'-3") and 5.4 m (17'-8") high, with basic design and appearances the same as existing adjacent shop buildings. Based on 414 square meters of construction and a projected future price of ₲17,280 per square meter (present price ₲14,400/m2 plus 20%) a cost estimate of approximately $54,000 is obtained. Construction will follow local established practices and consist of the following:

- Foundations	- Large, flat rock masonry
- Floors	- Portland cement concrete, nominally 15 cm. (6") thick but thicker, (20 cm), under heavier shop equipment
- Walls	- Brick masonry, 30 cm thick; locally manufactured brick
- Roof Trusses	- Dimension lumber; locally made, local lumber
- Roofing	- Corrugated metal roofing sheets, made available from USAID excess in Paraguay; roof will overhang 60 cms on sides and 165 cms on ends
- Windows	- Steel frame jalousie (glass louvers) available locally
- Door	- Main shop, sheet steel sliding doors, locally made; other doors, wood, locally made
- Water Supply	- Connect to existing 3" diameter supply pipe; from elevated tank and well on Institute grounds; necessary piping and fixtures available locally
- Sewage Disposal	- Connect to existing sewer line to septic tank; necessary piping available locally
- Electricity	- Connect to existing 220 volt power supply; necessary electirc wires, switches and fixtures available locally.

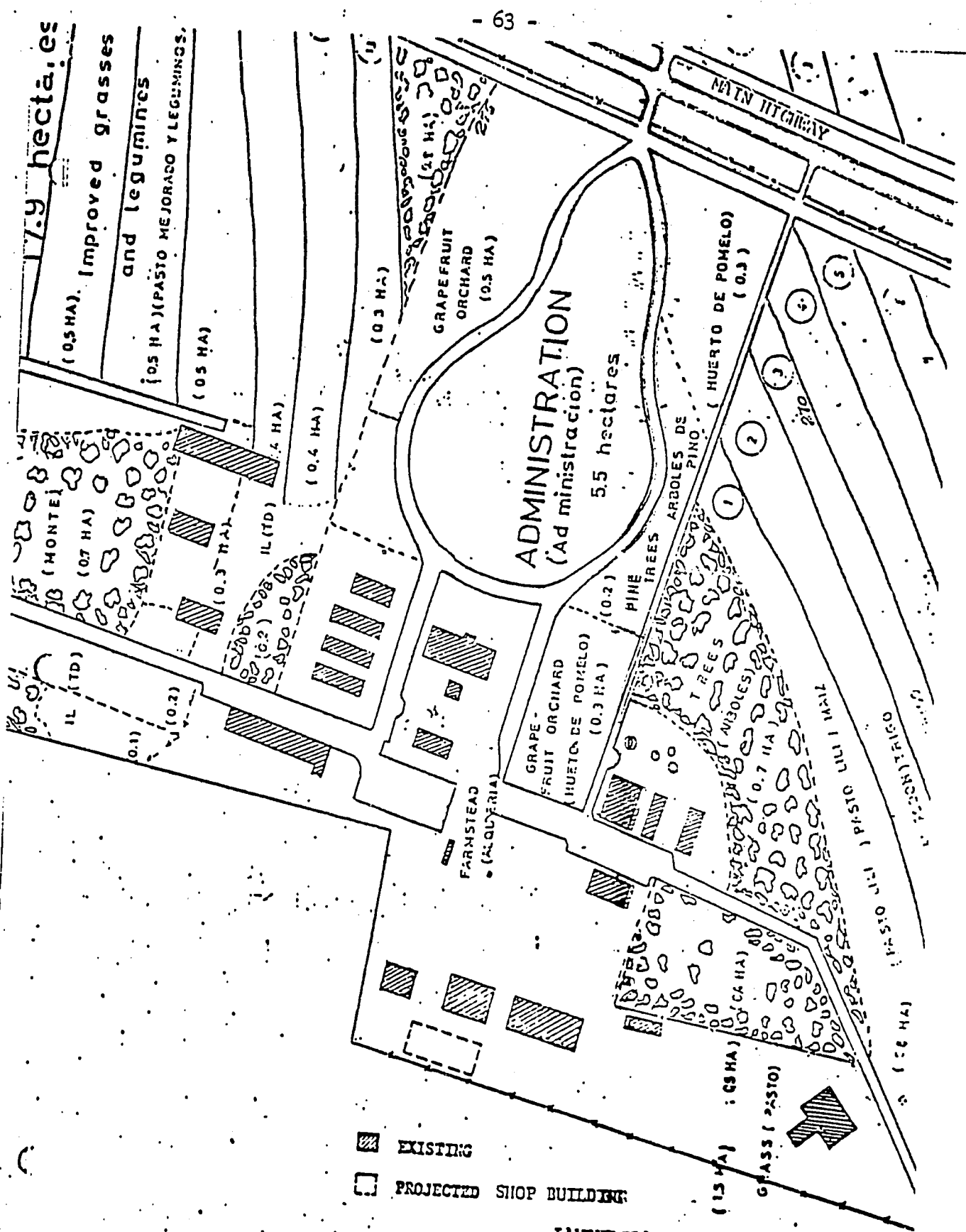
The building site is on gently sloping ground with excellent drainage toward the back of this new building and also the existing buildings. Engineering soils studies made for the existing buildings indicated good foundation qualities. No foundation settlements can be observed in the 3 existing shop buildings which have been in place about 3 years. The paved driveway which serves the existing buildings will be extended to serve the east end service door.



GENERAL FLOOR PLAN OF SHOP BUILDING



END VIEW



LAYOUT PLAN OF BUILDINGS
NATIONAL AGRONOMICS INSTITUTION
CAACUPE, PARAGUAY.

Having evaluated all of the attached studies and the Unattached Annexes, the project committee concludes that the project is technically sound. Further it is an innovative project which, if implemented as planned, will develop needed new technologies. The project meets FAA Section 611.

On the following pages are diagrams of various prototypes of potential usefulness to Paraguayan farmers.

PROTOTYPES OF POTENTIAL USEFULNESS TO PARAGUAYAN FARMERS

Exhibit 1. Stump-puller - Brace Research Institute Handbook, Canada

Exhibit 2. Bicycle wheel sprayer - U.S. commercial firm

Exhibit 3. Animal drawn tool bar - NIAE, England

Exhibit 4. Solar grain drier - USDA Grain Research Institue, Kansas

Exhibit 5. Axial flow thresher - IRRI, Phillipines

Exhibit 6. One ton grain drier - IRRI, Phillipines

Exhibit 7. Ox drawn sprayer - local design

Exhibit 8. 12 H.P. four wheel tractor - U.S. commercial firm

Exhibit 9. Savonias wind mill - ICA, Colombia

Exhibits 2, 3, 7 & 8 are currently being tested or used in USAID supported projects in Paraguay. AID plans to introduce the other appropriate technology machines illustrated here as part of its SMALL FARM TECHNOLOGY PROGRAM.

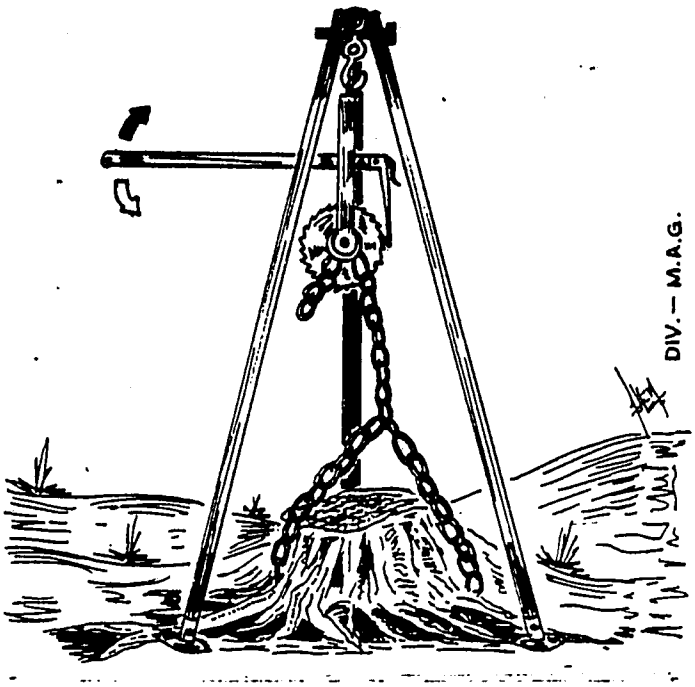


EXHIBIT 1: STUMP-PULLER

Clearing land in Paraguay is an extremely important task in colonization areas. Even in areas which have been farmed for many years, there is often still land to be cleared. Land is either cleared completely by hand (using an axe, shovel, and machete) or by bulldozer. The custom rate for clearing land is typically between $500-600 per hectare. Most of the labor, and cost involved is in removing stumps. A simple machine, as pictured above, could reduce the time required to clear land. This would permit more rapid development of land on farms with uncleared areas, resulting in faster capitalization and increased income to the farm families.

Source: Brace Research Institute, Canada.

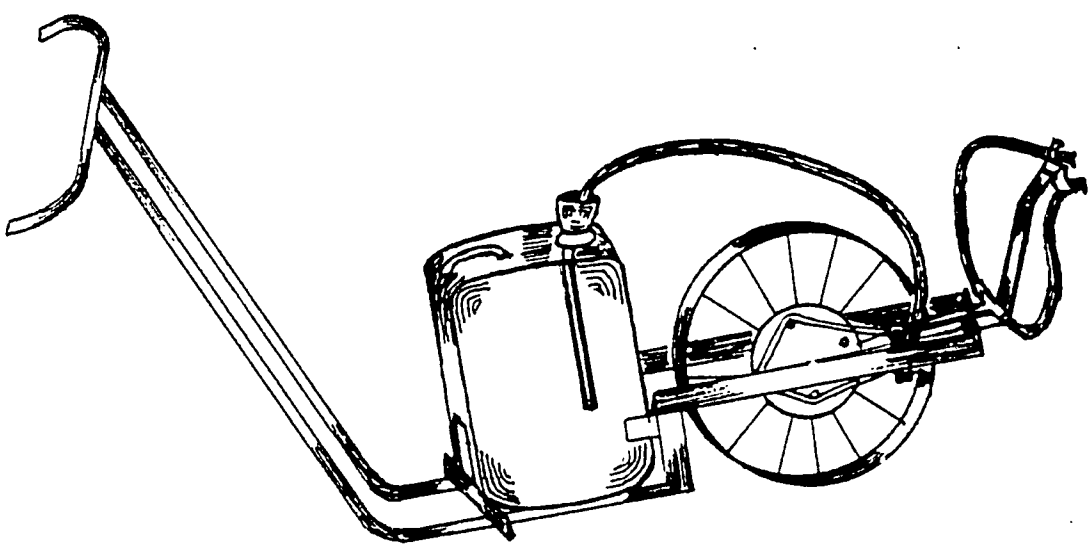


EXHIBIT 2: BICYCLE WHEEL SPRAYER

This sprayer provides a viable option to back pack sprayers on very small farms. It is less tiring to operate and pressure control is more precise. It uses a very simple principle of a flexible tube squeezed by prongs mounted on the wheel as a pump. This unit was introduced to Paraguay by USAID contract soils specialist and has been in use on experimental plots for a year.

Source: U.S. Commercial firm.

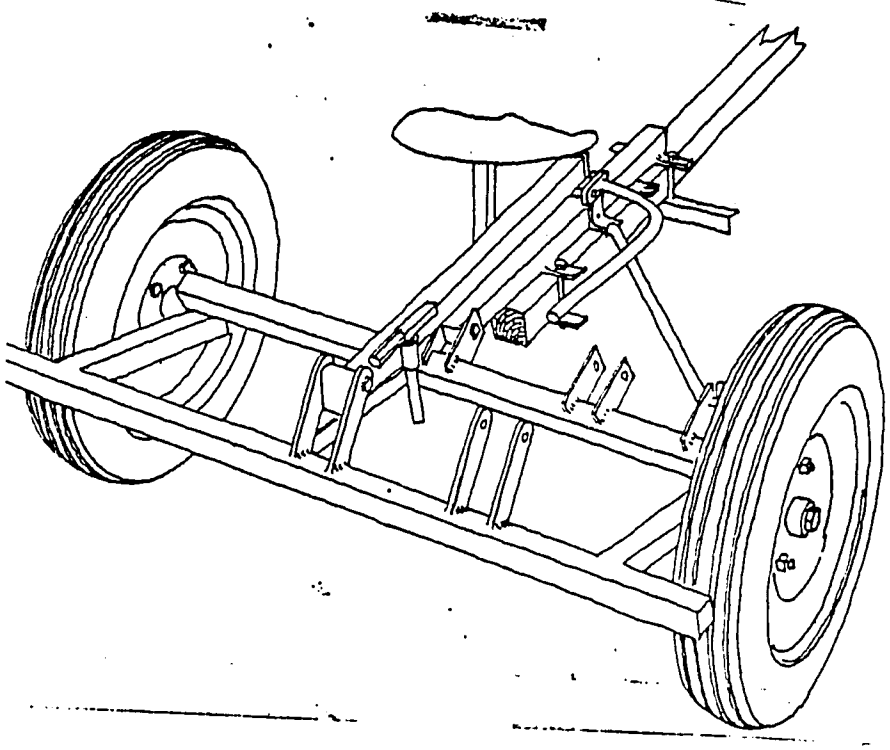


EXHIBIT 3: ANIMAL DRAWN TOOL BAR

Oxen and horses are extremely important sources of power in Paraguay. Yet efforts to improve animal drawn implements have been limited since the advent of tractor power. This tool bar provides a very flexible base upon which various forms of implements can be mounted - plows, harrows, cultivators, planters, sprayers and even a box to convert it to a trailer for hauling products to market. Such a design may well be useful in improving the efficiency of animal traction equipment, expanding the area small farmers can bring under cultivation.

Source: NIAE, England.

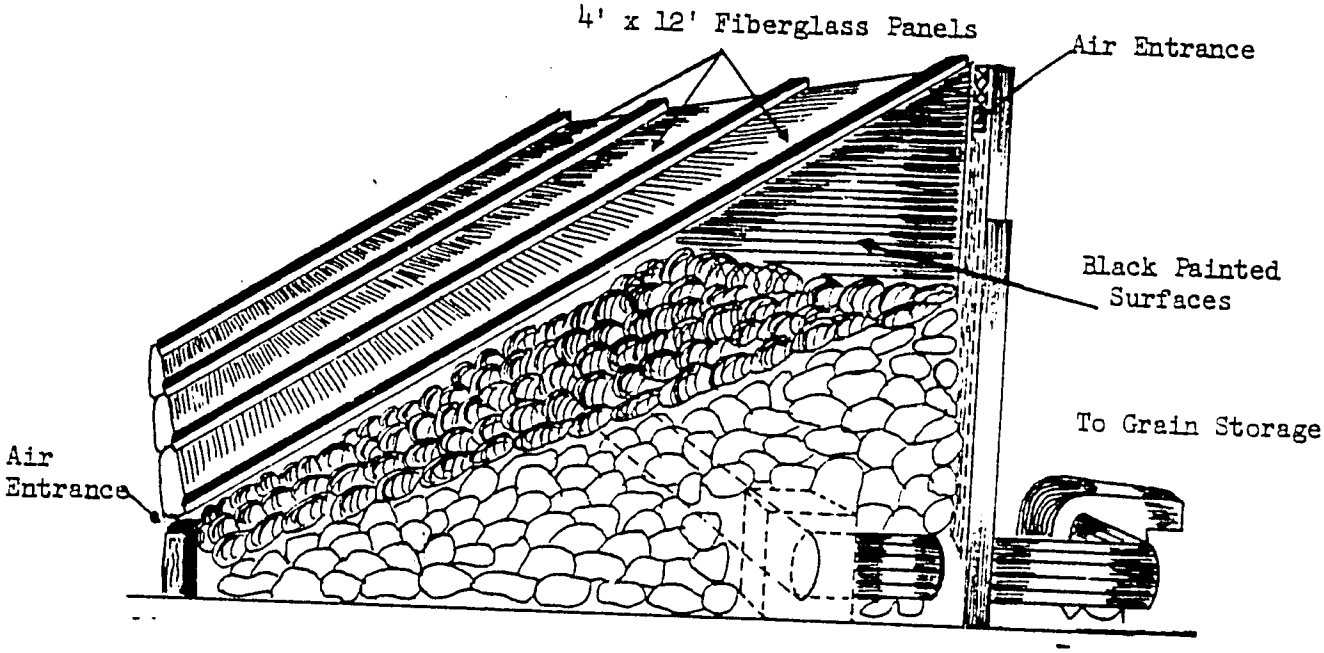


EXHIBIT 4: SOLAR GRAIN DRYER

There is a potential need for grain handling and storage systems suitable for use at the community level and by small cooperatives. A simple solar heat collector made of a plastic sheet covering a pile of rocks is being used experimently in the United States. The rocks collect the heat energy from the sun which then is used to dry the grain. Since petroleum is very costly in Paraguay, utilization of solar energy for grain drying would be very attractive.

Source: USDA Grain Research Institute, Kansas.

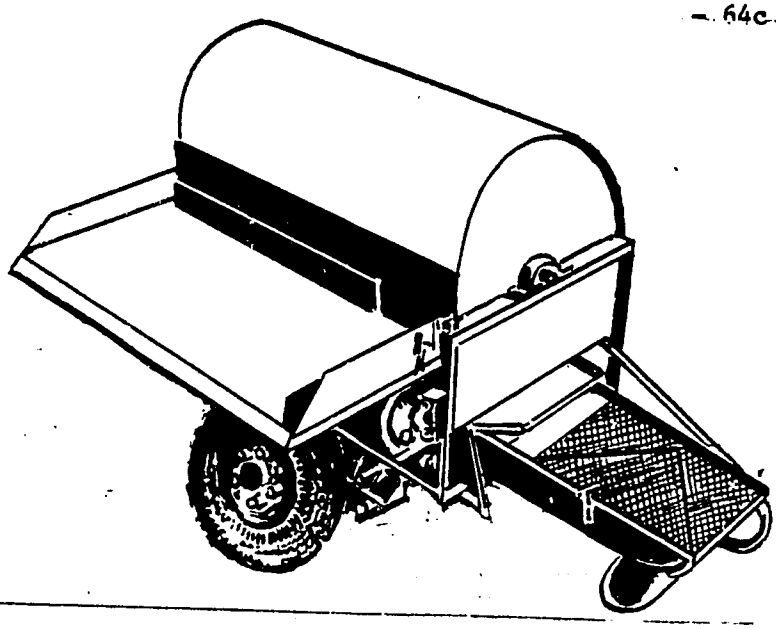


EXHIBIT 5: AXIAL FLOW THRESHER

One important limitation to expansion of grain production on small farms including wheat as a winter crop, is harvesting. Attempts have been made to use large scale combines on a custom basis to duplicate the technology utilized on large commercial operations. These attempts have not been highly successful because of the small size of the plots and the considerable time the machine spends in road travel. Small stationary threshers of a very old design are used in some parts of the country.

The machine pictured is capable of threshing rice, soybeans, sorghum, and other small grains. Asian experience indicates that this machine has a capacity of one ton per hour of rice and can be sold for about US$1,200. It could facilitate increased grain production on small farms.

Source: International Rice Research Institute, Phillipines.

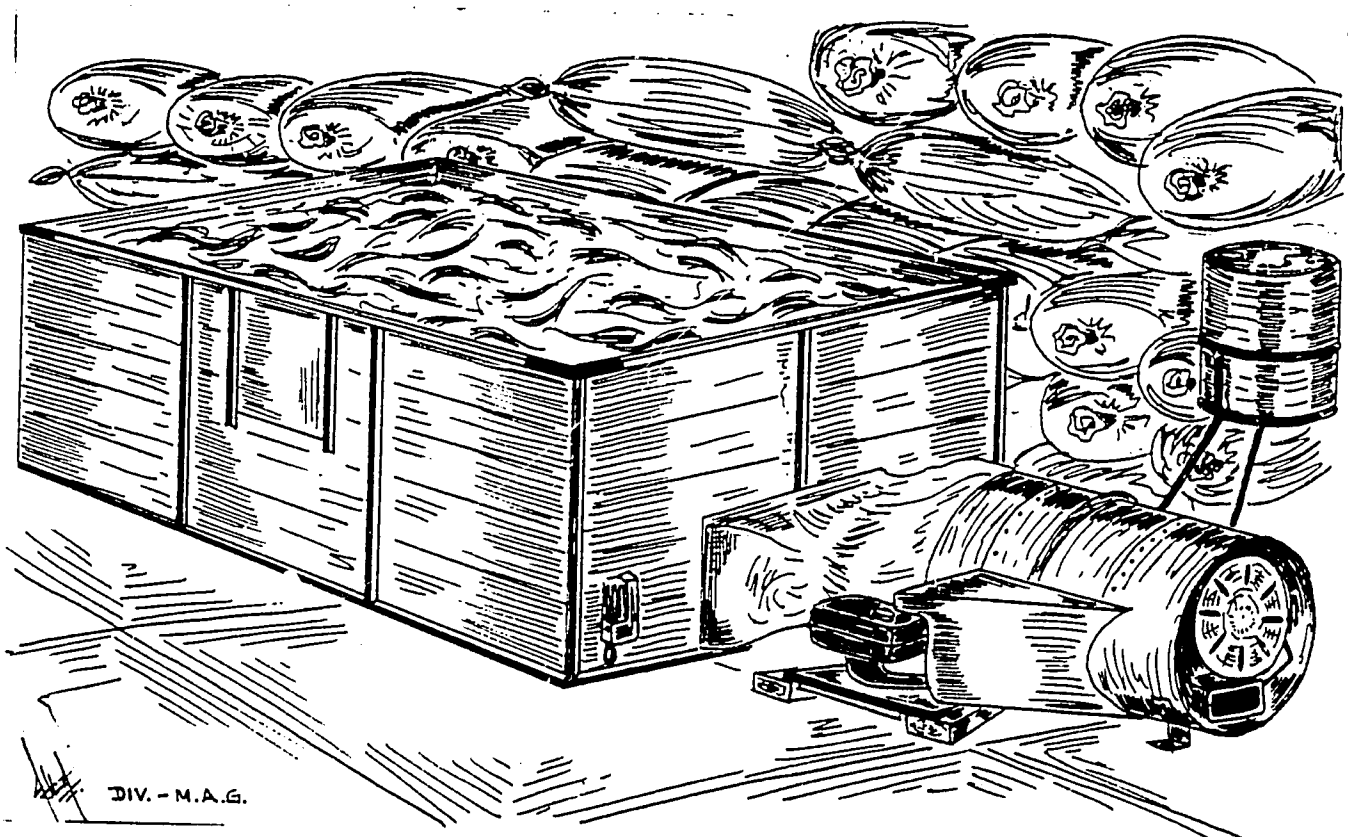


EXHIBIT 6: ONE TON GRAIN DRYER

The one ton batch dryer above is a possible technology to be applied at the community level, or even on farms of the 10 to 20 hectare range. Experience in Asia indicates that this design can be constructed for less than US$600. Wood can be used as a source of fuel (illustration is of kerosene version). The bin can be made of wood or steel construction. USAID/Paraguay has complete engineering drawings on file.

Source: International Rice Research Institute.

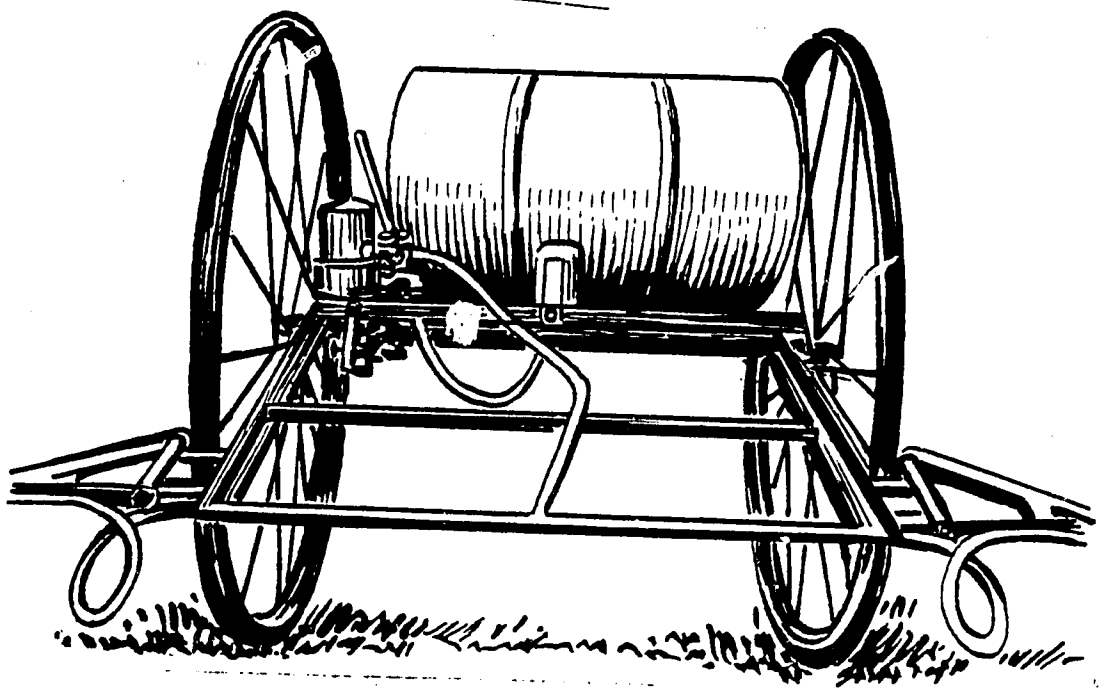


EXHIBIT 7: OX DRAWN SPRAYER

This machine is commonly found in Paraguay. Several small machine shops have manufactured it for local sales. It presently costs about US$500. Modifications could probably be made in the design to improve its efficiency and increase the life of the tank and pump. The USAID sponsored CREDICOOP project supports the distribution of these sprayers among small farmers.

Source: Local design.

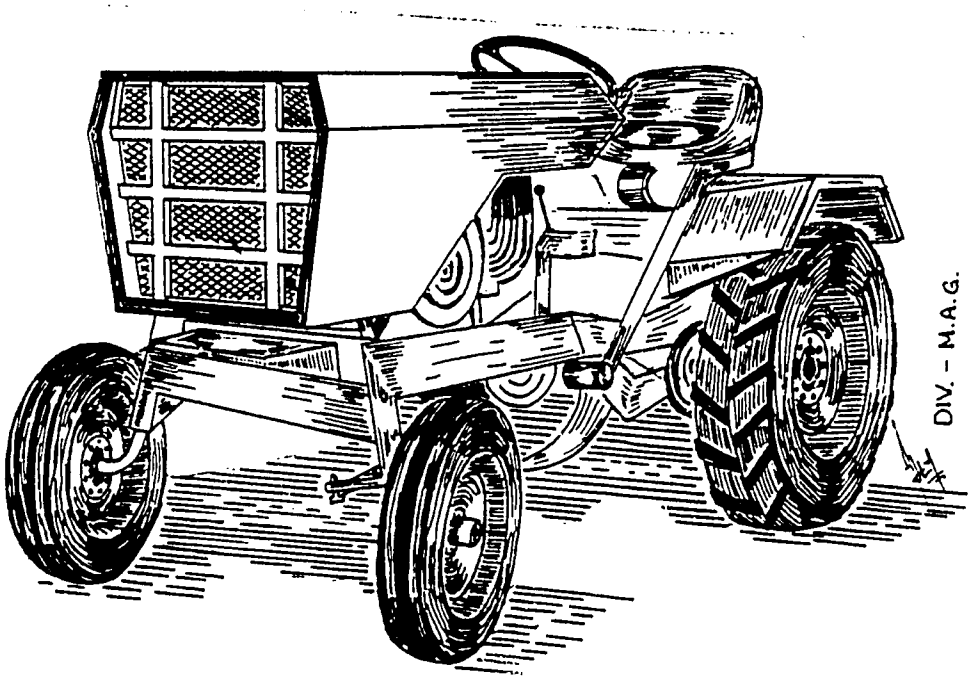


EXHIBIT 8: 12 H.P. FOUR WHEEL TRACTOR

Small tractors should be compared with animal power to determine what is best suited to farms of various sizes. The model shown is designed by a U.S. firm especially for small farmers with limited mechanical knowledge. Any engine of a suitable size can be bolted to the frame and utilized because of the belt drive connecting the power source and the trans axle. The machine could b partially manufactured in Paraguay. USAID is presen tly carrying out feasibility studies on this tractor in field tests being conducted with Paraguayan counterparts.

Source: U.S. Commercial firm.

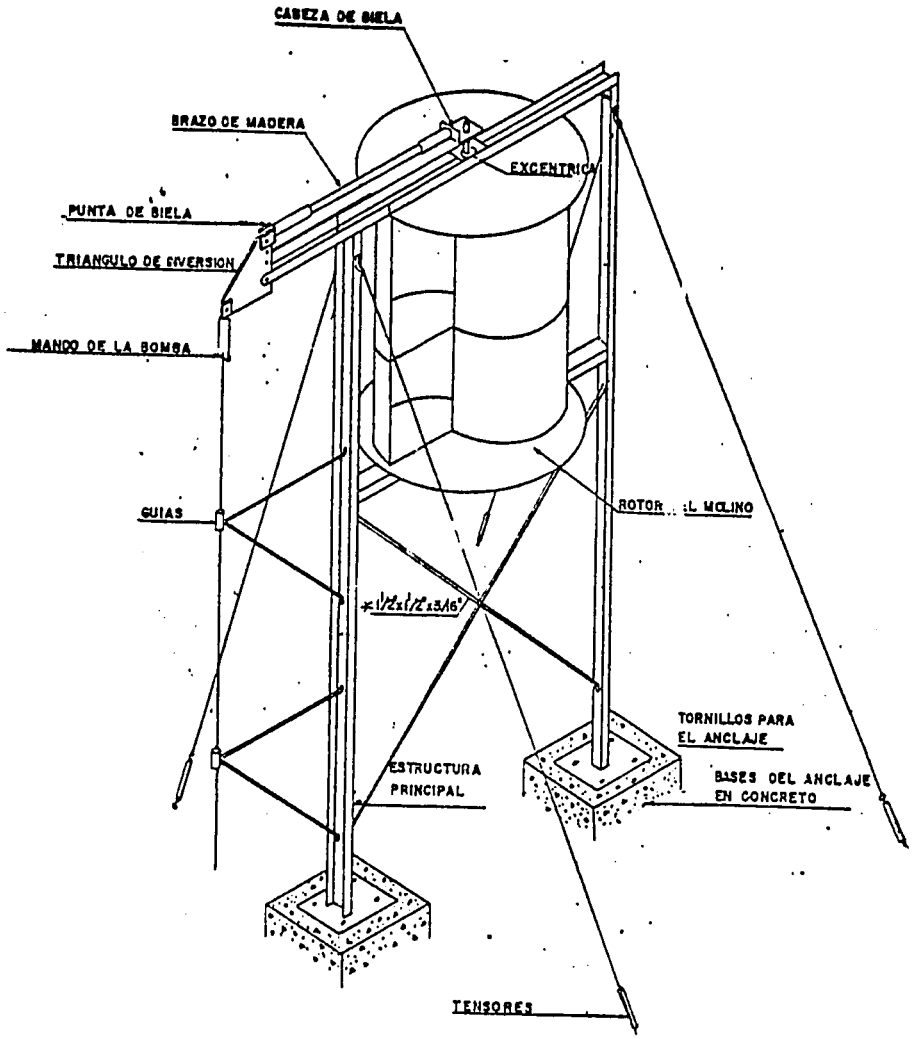


FIG.1 ESTRUCTURA PRINCIPAL

EXHIBIT 9: SAVONIAS WINDMILL

This windmill is constructed from the two halves of an oil drum. It could be used in Paraguay to pump water for the farm family and their livestock. This particular design has been used successfully in the Colombian Llanos for several years.

Source: ICA, Colombia.

ANNEX IV

SOCIAL ANALYSIS AND PROJECT MAPS

A. BACKGROUND

Even though Paraguayans have relatively unlimited land resources suitable for agriculture or animal husbandry most choose to keep their farm enterprises small and labor intensive. Minifundia plots and farms up to twenty hectares predominate, especially in the Central Zone around Asunción, the capital city. In that region one finds numerous rural villages and scattered settlements of smallholders who exploit farms that rarely exceed 10 hectares in size. Even in the outlying frontier regions farms tend to be under 25 hectares with farmers exploiting only about one-half of their land area. Regardless of the amount of land available labor is a major constraint and families cannot generally cultivate more than three hectares total, as explained in the technical section.

While most Latin American nations tend to have larger and larger farming enterprises (latifundismo) Paraguay's number of small farms is increasing. Since Paraguay took its last and only modern agricultural census in 1956 there is wide evidence that the number of smallholdings has increased, as much as 50% in some Departments of the country. Up-to-date data being generate by the national cadastral project indicates that Paraguay likely has a total of at least 250,000 farm units with perhaps seventy percent of them being under twenty hectares in size. There are an average of 6.6 persons per farm family so there are presently about 1,650,000 persons employed primarily at the farm level.

On the face of it the Paraguayan propensity to remain on the small family farm seems ideal. In fact Paraguay suffers few ill-effects from urbanization because relatively little urbanization is taking place.

In spite of these superficial advantages all is not well with the small farm population. It is probably the most socially and economically disadvantaged group in the country even though it is large. Because farms are spread over a large area farmers cannot serve as an effective pressure group to get their share of the goods and services they generate for the nation as a whole. While the World Bank indicated in 1976 that Paraguay's GNP per capita income was $480, an AID Small Farmer Survey in that year showed that farmers earned less than one-half as much as the national average.

The Paraguayan Government recognizes that there is a serious disparity of income between small farmers and the rest of the population. In October 1977, the newspaper ABC Color, which usually reflects government viewpoints, published an editorial entitled "Freeing small farmers from poverty". The article stated that at least fifty percent of Paraguay's small farmers live on the subsistence level, and because of their disadvantaged position, have little opportunity to improve themselves.

Small farmers receive few services from the central government. As one interviewed farmer put it "we don't understand why they don't give us clear answers to our requests in Asunción. Many times someone promises us something while knowking they aren't going to come through with it."

Farm families tend to remain captives of their environment. Earning an average of less than $330 per capita 1/ they are unable to better that environment. So year after year they drudgingly till a few hectares with their one set of oxen, their one moldboard plow and the labor of their children. In a complex five year crop rotation schedule they grow about fifty different products, hopeing that if one fails they can sell another in its place. They enjoy few effective health, educational, or economic services.

In its 1977-1981 Plan for Social and Economic Development the government of Paraguay states that one of its major goals is to improve the welfare of the rural poor. The five year agricultural subplan says it will accomplish this goal by showing farmers how to use resources they have by improving the quality and quantity of production, by improving the level of their human resources and generally by "assisting them to absorb more modern technologies in order to increase their yields."

Small farmers wholeheartedly support the Central government's goal of improving their situation - as borne out by the recent AID funded MASI study of market towns. That study demonstrated that even in rural towns informants felt there was an immediate need for increased agricultural services, especially in the technological area. Because the farmer's and the Government's goals are virtually synonymous there should be little, if any, social disruption caused by initiating the proposed project.

The organizational forms existing in Paraguay are ideal for helping farmers and the government to reach the mutual goal of improved farmer welfare through improved productivity. The proposed project builds upon an institution (SEAG) well established and recognized by small farmers. Small farmers are accustomed to getting technical information from local extension agents - farmers complain that there simply are not enough agents or resources to go around.

In designing this project SEAG and USAID made every effort to ensure that potential participators in the proposed project would be (1) members of the target group and (2) have enough interest and resources to gain substantially from improved technological practices. Designers used four criteria to decide where to locate the proposed seven regional service centers so that they could reach the maximum number of appropriate beneficiaries.

1. The region must have at least one firmly established credit center which serves small farmers. It could be an A.U.C.A. (Pre-cooperative lending agency), CREDICOOP or a National Development Bank "Committee of Agriculturalists".

1/ 1977 prices equivalent to $150 in 1969.

2. SEAG must have a working agreement with one of the credit facilities (named above) in the region, or the potential for making one within an existing national agreement.

3. The region must have a high concentration of minifundistas who are economically disadvantaged.

4. There must be a branch of the national agricultural experiment station within close enough proximity to provide backstopping for applied research projects at the farm level.

B. LOCATION AND SIZE OF PROJECT TARGET GROUP

Because of several excellent map resources available to the USAID it was possible to specifically locate members of the target group living in areas meeting the four criteria outlined above. Because of the USAID supported cadastral survey it will be possible to identify the ownership, location and survey limits of every farm in eastern Paraguay. Some of that data is available presently, and coupled with other sources, gives an excellent overview of where the target group lives. Seven Spatial Distribution Cluster Maps follow , showing the zone of influence of each of the proposed regional centers. These maps show the distance between each of the 43 satellite centers to be established by the Project, as well as the actual number of farm families living in each satellite area. Maps in Unattached Annex C found in LA/DR files shows the actual location of each agency on a conventional map.

Table 1 gives the total population and number of farms for the seven regions. From that it can be seen that if SEAG reaches its goal of working with 60% of the target population 57,688 farm families will be served, or about 380,739 persons. Because of the mass communications component of the project it is likely that all those living in these identified target regions will benefit from the introduction of technological innovations. Of course some will benefit more directly than others, and to a greater or lesser extent. At this point in time one can do little more than point out that there are candidates in these regions who are likely to benefit from the proposed Project if it is implemented in the zones identified here.

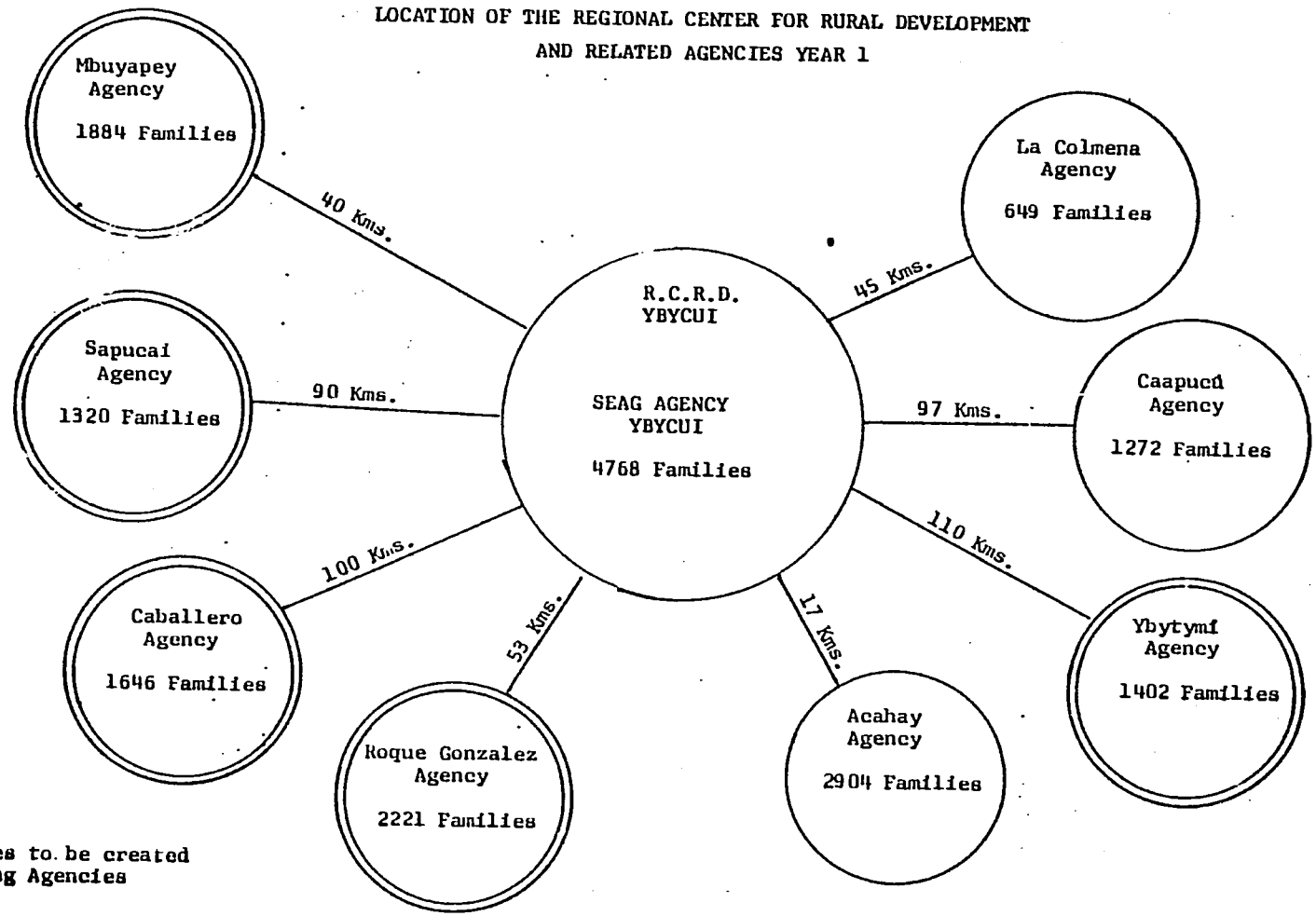
TABLE 1

TOTAL NUMBER OF BENEFICIARIES OF PROJECT BY ZONE OF INFLUENCE

YEAR	ZONE	FARMS	No. OF PEOPLE	60% OF TOTAL FARMS	60% OF TOTAL RURAL POPUL.
1	Paraguarí	18,066	119,236	10,840	71,542
1	Encarnación	14,351	94,717	8,611	56,830
1	Cordillera	17,233	113,738	10,340	68,243
2	Ñeembucú	7,229	47,711	4,337	78,627
2	Central	12,273	81,002	7,364	48,601
3	Caaguazú	17,375	114,675	10,425	68,805
3	Caazapá	9,619	63,485	5,771	38,091
	Total	96,146	634,564	57,688	380,739

PARAGUARI ZONE

LOCATION OF THE REGIONAL CENTER FOR RURAL DEVELOPMENT
AND RELATED AGENCIES YEAR 1

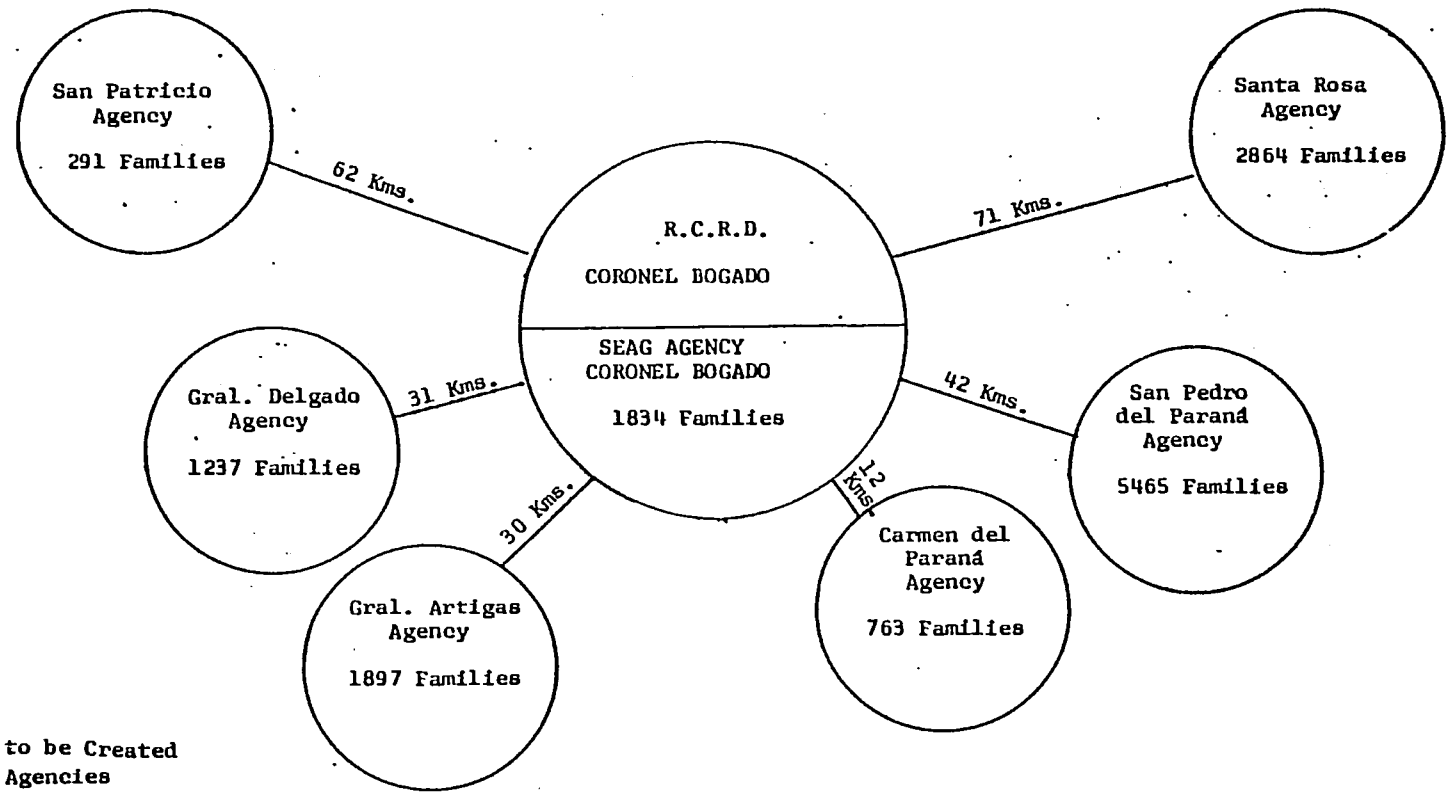


REFERENCE

Agencies to be created
Existing Agencies

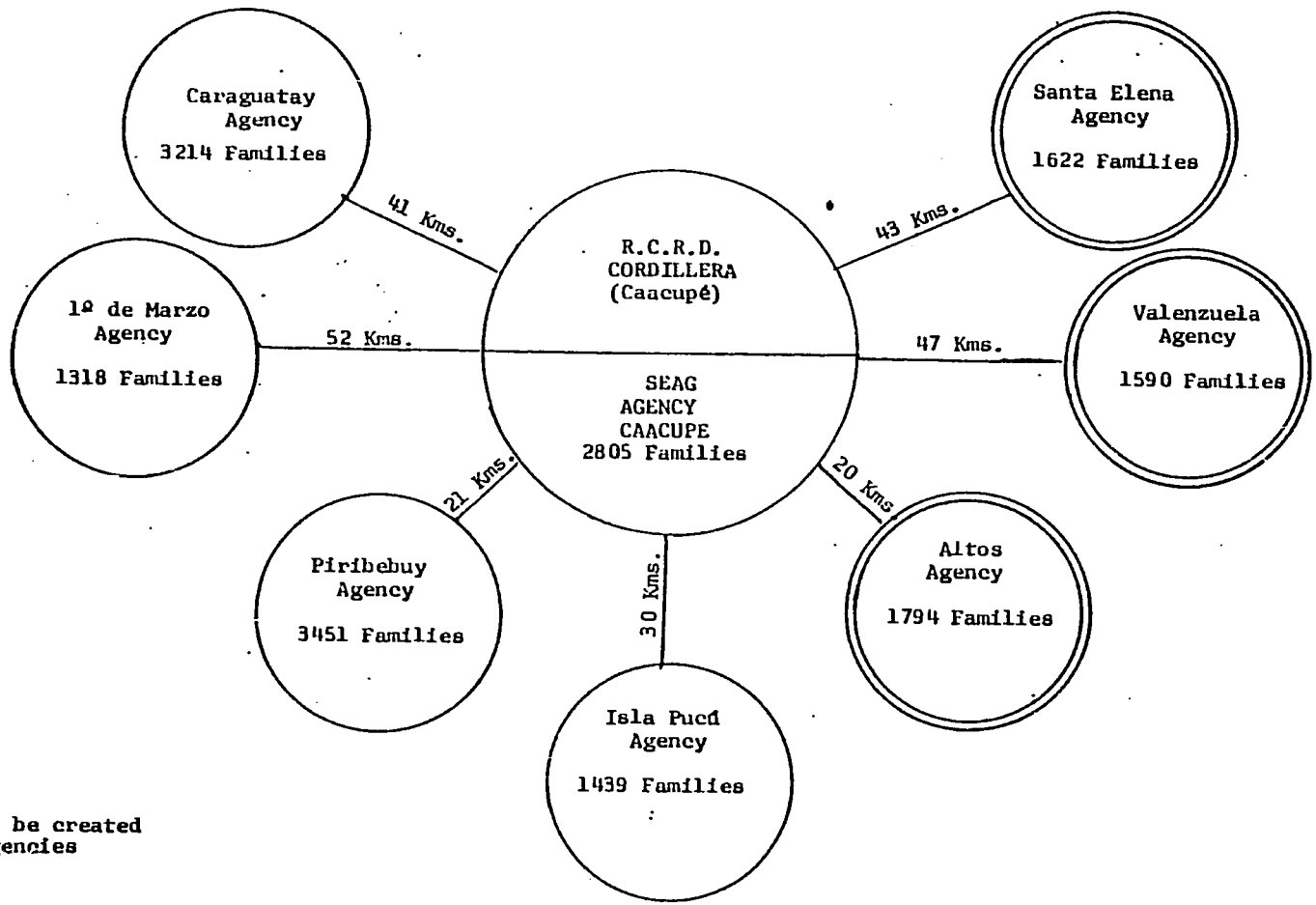
ENCARNACION ZONE

LOCATION OF THE REGIONAL CENTER FOR RURAL DEVELOPMENT
AND RELATED AGENCIES YEAR 1



CORDILLERA ZONE

LOCATION OF THE REGIONAL CENTER FOR RURAL DEVELOPMENT
AND RELATED AGENCIES-YEAR 1

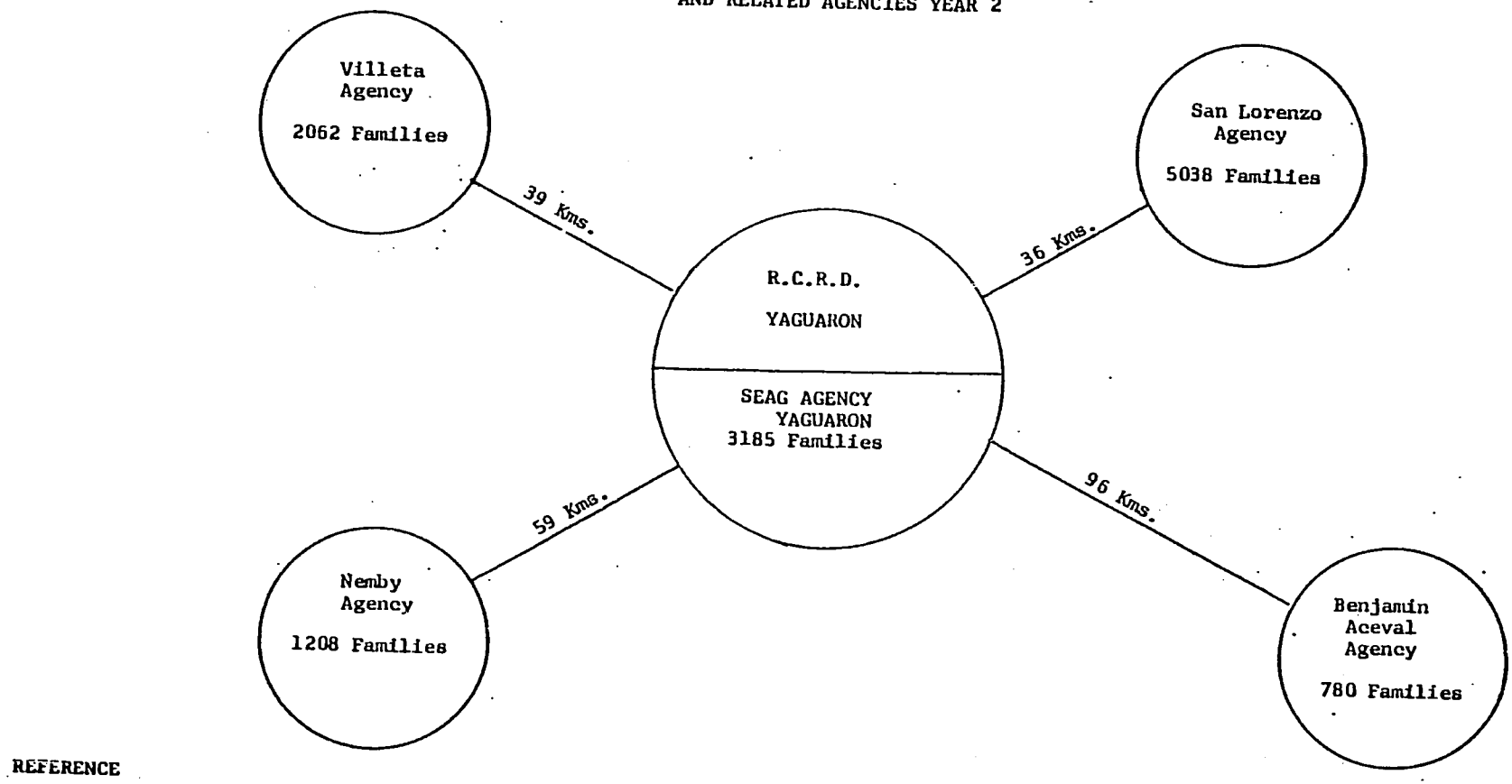


REFERENCE

Agencies to be created
Existing Agencies

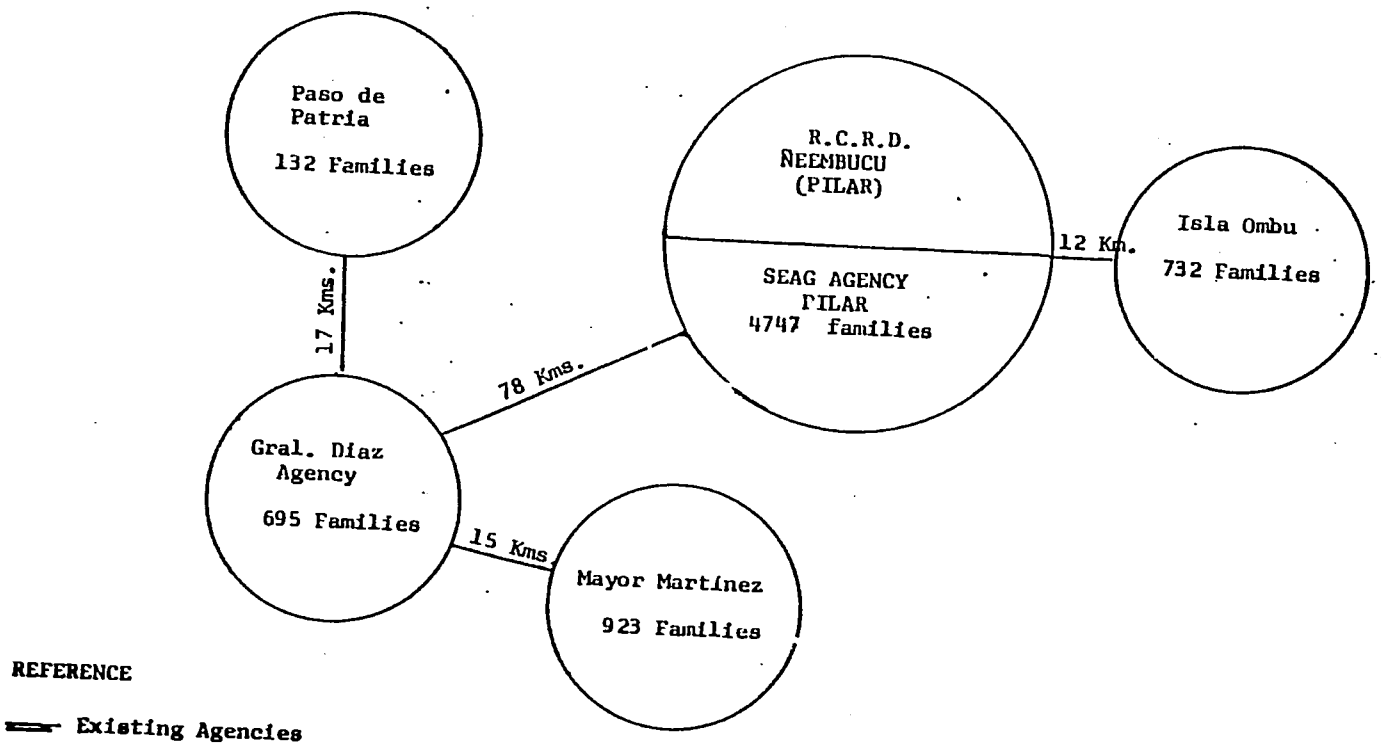
CENTRAL ZONE

LOCATION OF THE REGIONAL CENTER FOR RURAL DEVELOPMENT
AND RELATED AGENCIES YEAR 2



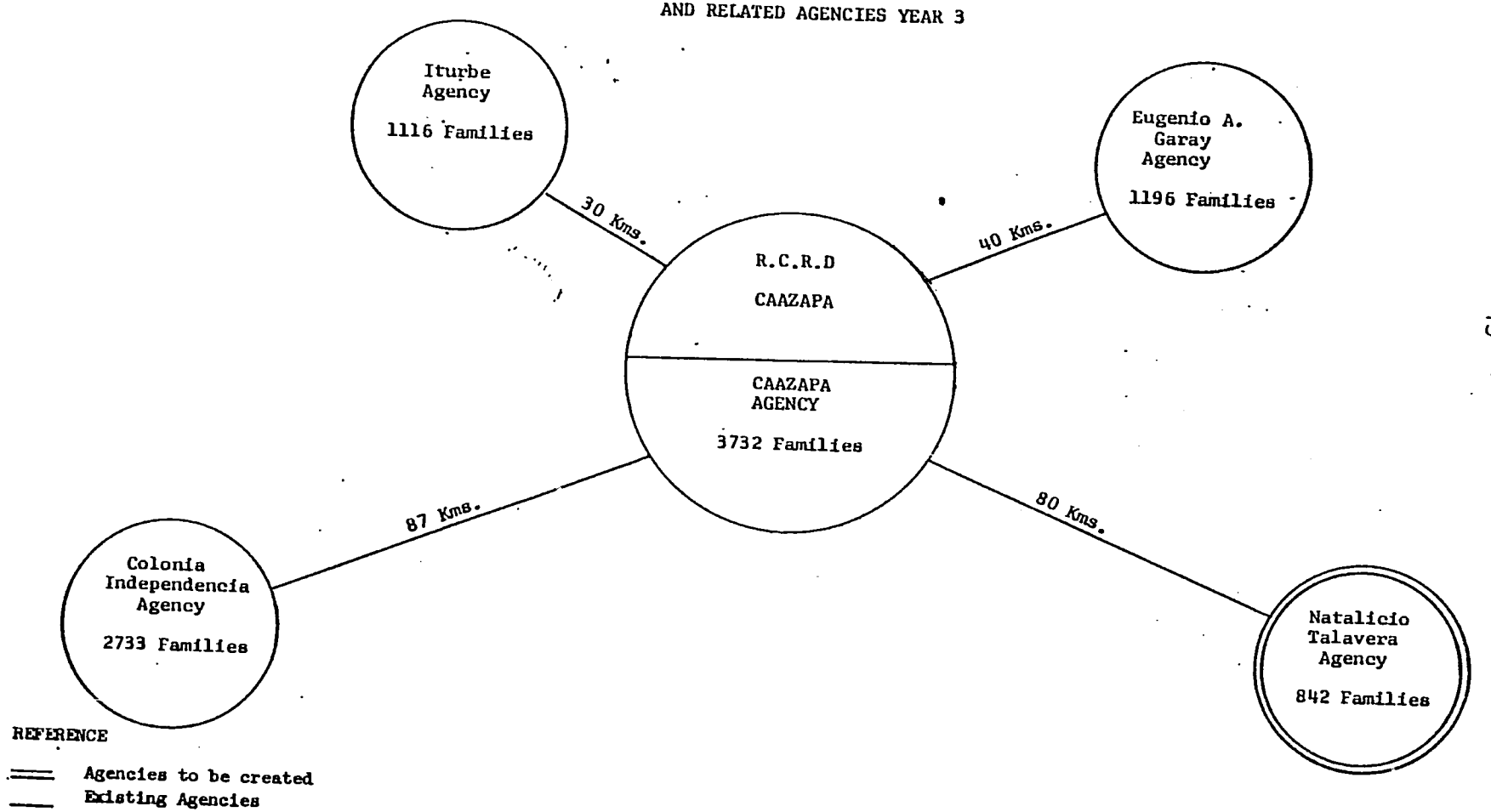
NEEMBUCU ZONE

LOCATION OF THE REGIONAL CENTER FOR RURAL DEVELOPMENT
AND RELATED AGENCIES YEAR 2



CAAZAPA ZONE

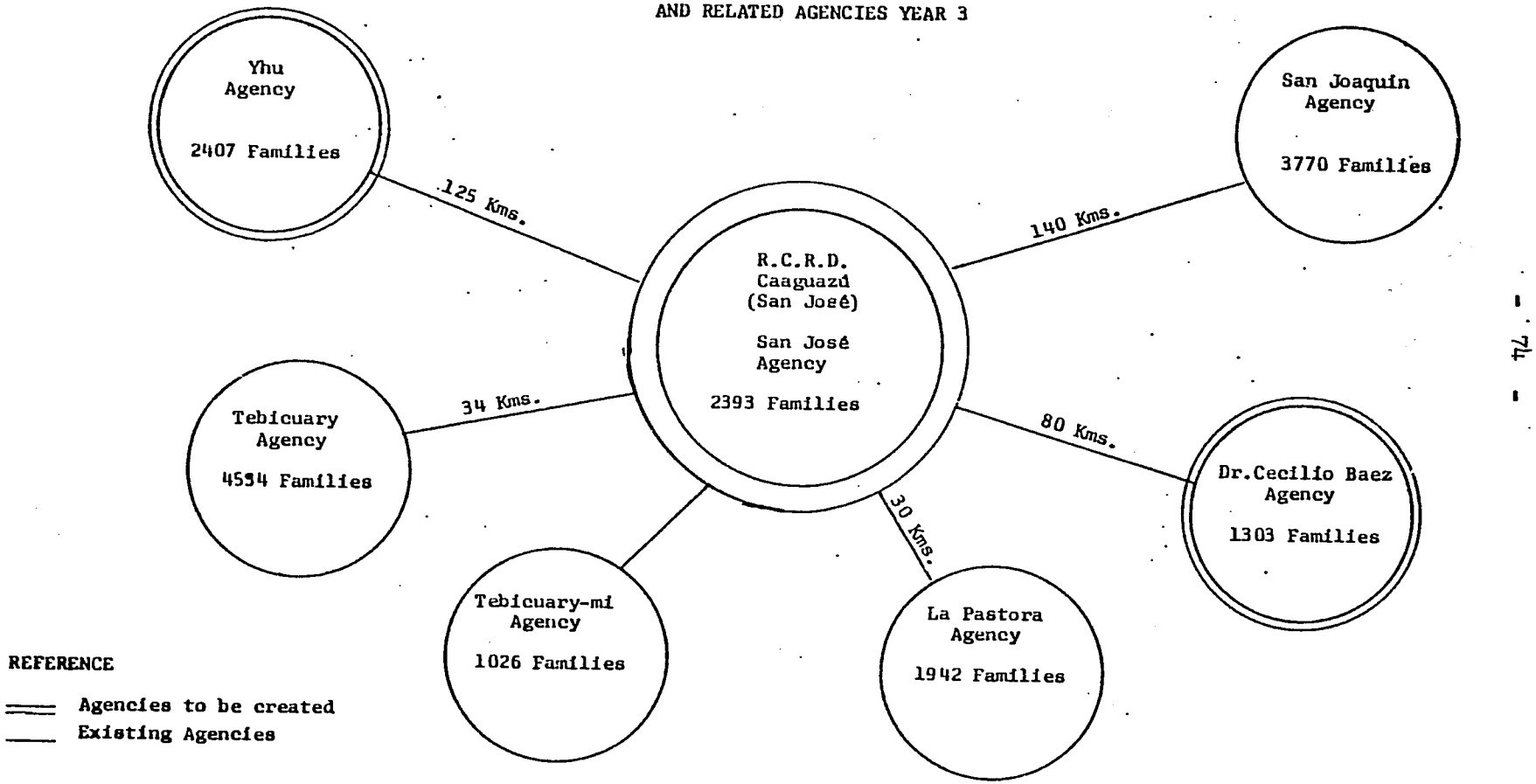
LOCATION OF THE REGIONAL CENTER FOR RURAL DEVELOPMENT
AND RELATED AGENCIES YEAR 3



CAAGUAZU ZONE

LOCATION OF THE REGIONAL CENTER FOR RURAL DEVELOPMENT

AND RELATED AGENCIES YEAR 3



While preparing the "Agro Economic Profiles of Seven Target Areas and Benefits", Table 1, Economic Analysis Section, it became clear that farm sizes were particularly small in these target areas. This is not surprising, of course, because these zones were selected precisely because of their minifundista character. The startling fact is that there is a close correlation between present area cultivated and the potential economic improvement that might occur in the seven zones. Cultivation indices for the seven zones are compared with annual potential benefits in Table 2

TABLE 2

Region	Cultivation Index 2/	Potential Benefit per Farm
Cordillera	1.16	$ 14.38
Paraguarí	1.73	52.09
Encarnación	2.23	21.68
Central	.38	75.91
Ñeembucú	.52	68.10
Caazapá	1.64	43.93
Caaguazú	1.03	28.92

Most of these findings are discussed in greater detail in the economic section but it is important to emphasize that cultivated areas in the zones are extremely small, especially in Ñeembucú and Central. Furthermore it is evident that the smaller the farm the more likelihood there is that it will benefit from the Project. The decision to serve the poorest areas, namely Central and Ñeembucú, in the second year of the Project came about because Agricultural technicians preferred to work with less difficult areas during the first year of the project. Thus experience could be gained which will facilitate improvements in the most difficult zones.

C. CHARACTERISTICS OF THE TARGET GROUP

By identifying and locating the intended beneficiaries within the target regions much is learned of their characteristics. Furthermore, the recently submitted USAID Project Papers for CREDICOOP, Rural Roads and Market Towns all discuss rural beneficiaries in great detail. Income, in particular, is covered in the Rural Roads PP. The Mission feels it unnecessary to repeat all of the information submitted as part of the social analysis in those documents and suggests that persons wishing to have greater detail than that included in this analysis should consult the aforementioned Project Papers. Nevertheless, below is a summary of the socio-economic characteristics of the particular group identified for assistance under the proposed Project.

The Target Group definition of farms of less than 20 hectares is clearly too broad for the proposed Project. Selection criteria based upon size of

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2/ Derived by dividing total hectares cultivated in zone by number of farms reported. Does not allow for multiple cropping or milti-year cropping, particularly for exotics, such as some fruits or bitter orange.

farm infer that size of farm is highly correlated with income and that commercial and near subsistence farmers can be separated by size of their land holdings - but this is not the case in Paraguay. This is a valid approach in countries where nearly all the good agricultural land available is being utilized and the poor are concentrated in certain areas on small acreages. But how does this apply to the case in which land resource base is not (at least in the medium term) the factor most limiting incomes, i.e. in the target regions? In Paraguay, best estimates suggest that there are 8.8 million hectares of potentially arable land and perhaps only one million is currently used for agricultural purposes. (If one includes poorly drained lands which have a potential for rice production, but are too wet for other field crops, the area suitable for agricultural purposes would be much more than this.) Under this circumstance, as might be expected, farm size becomes a much less useful tool for separating disadvantaged from more advantaged farmers. The data below (taken from the Sector Assessment) demonstrate that in Paraguay farm size is poorly correlated with farm income.

TABLE 3

ECONOMIC CHARACTERICTICS OF SMALL PARAGUAYAN FARMS*(1972 Prices)
Source: Small Farmer Sector Assessment

	Less than 3 Has.	3 and 4 Has.	5 to 9 Has.	10 to 19 Has.	20 to 29 Has.	30 Has. above
1. Average size of farm	1.4	3.6	6.5	12.7	22.8	58.4
2. Ave.net income	$ 323	740	908	1215	1611	2461
3. Ave.net cash income	$ 141	370	511	760	1027	1524
4. Per capita net income 1/	$ 65	148	181	243	322	496
5. Per capita net cash income (1972 prices	$ 21	56	77	115	155	231

*/ Using a family size of 6.6, adjusted from original.

Clearly, the farms with less than three hectares are the poorest, and adding additional land has a proportional effect upon income up to perhaps five hectares. Here the proportional relationship between income and farm size discontinues. From this point forward, the contribution of additional farm size to income is very weak. According to the statistics in lines 6-9, the average farm in the 10 to 19 hectare group (12.7 hectares) has only 1.6 times the income of the average farm in the three to four hectares group, even though the farm is 3.5 times as large.

The data below suggest why these relationships occur.

TABLE 4

FARM SIZE AND LAND USE IN PARAGUAY

	Less than 3 Has.	3 and 4 Has.	5 to 9 Has.	10 to 19 Has.	20 to 29 Has.	30 Has. above
1. Ave. size of farm	1.4	3.6	6.5	12.7	22.8	58.4
2. Has. used for crops	1.4	3.0	3.9	5.3	7.9	11.9
3. Percent (2) ./.(1)	100%	80%	60%	41%	34%	20%

Consistent with the hypothesis that land is not the limiting factor in farm incomes, these data indicate that the area cultivated changes minimally with increases in farm size. It might be added that the evidence suggests that there is little difference in technology (no greater application of modern inputs) with increased farm size.

If we return to the most fundamental measure of welfare, per capita income, we find that based upon the 1972/73 survey data, and the 1975/76 data the minifundistas identified in the proposed target zones clearly fall under the $150 per capita income (1969 prices) proscribed by the A.I.D. mandate.

In addition minifundistas in the target zones frequently receive inadequate education and health care. CPES, the Centro Paraguayo de Estudios Sociológicos did a study of the "Characteristics of the agricultural exploitation in areas where minifundistas predominate". One of the districts studied, Santa Rosa, is included in the proposed Project. They found that none of the minifundistas in Santa Rosa attend school beyond the third grade whereas several of the children from larger farms completed the sixth grade and one attended the university.

In order to test out the general assumptions made about charateristics of the target group one District was selected entirely at random from the proposed target area. The District chosen was ACAHAY, a region settled in the 1977Os and repeatedly farmed by descendants of the original Spanish colonists. As each generation grew up in the area family heads subdivided their properties so that all male heirs would have land. Today the region is predominantly minifundista in character with about 2900 farms being in that class. Table 5 shows the most important agro-economic data for the District.

TABLE 5

AGRO-ECONOMIC PROFILE OF ACAHAY
1976

Major Crop	Total Has.	Average Yield Kg./Ha.	Local Price $	Nat. Yield Kg./Ha.	Difference with Nat. Yield Kg./Ha.	Potential Yield Obtained Kg./ha.*
Corn	2,682	949	.115	1,366	- 417	5,000
Beans	745	549	.346	783	- 234	3,000
Sweet Potatoes (Batata)	135	12,382	.076	8,280	+4,102	30,000
Mandioca (Cassava)	783	16,823	.42	14,800	+2,023	30,000
Cotton	1,278	824	.307	978	- 154	3,450

* Estimates of the Rockefeller Foundation, Working Papers Food Crops in the the Low-Income Countries. The State of Present and Expected Agricultural Research and Technology.

On the basis of Table 5 one can see that the minifundistas of ACAHAY are particularly successful at growing root crops, the principle subsistance crops of Paraguay, but that they have poor local yields for all other crops. As the two right hand columns of the table demonstrate there is clearly much room for increased production in this district. At a minimum farm yields could be increased to the Paraguay national average, then farm incomes would increase about $86 per annum. If farmers in the District could learn to bring their yields to a conservative international yield level farm incomes would increase an average of about $1200 per annum. These observations are not directly related to the social analysis and they are covered in greater detail in the economic analysis for all regions of the proposed project. They are included here simply to show at the micro socio-economic level what could be achieved in a given community where minifundistas can be identified on a farm by farm basis.

D. MATCHING PARTICIPATORS AND THE PROJECT

Local SEAG agents take their place alongside time honored institutions such as local priests, military leaders and teachers and have considerable influence over local opinion. Of the several government institutions working in the campo or rural environment, SEAG is probably the one closest to small farmers.

Paraguay's extension service focusses it's efforts on groups, the only cost effective approach in extension outreach. Currently, there is one SEAG extensionist for every 2,732 farms in the agricultural labor force. A British consultant recommends a ratio of one agent to every 1,000 farms. The proposed project will improve the ratio to one agent per 1,250 farms in the target areas. Their impact will be increased because of the mass communications feature of the Project and they should reach greater numbers.

Agents already have established procedures for working with local groups. For example, in Ñemby there is a local Development Council with whom SEAG works, while in Caballero it meets in a farmer's home and works jointly with the National Development Bank and the Agricultural Experiment Station. In other words, SEAG adjusts its approach so as to cooperate most fully with the local organizational structure - no matter how it is constitute. This ensures the maximum participation of intended beneficiaries in the local decision making process.

As an institution SEAG sees itself more and more as an supplier of services in addition to that of technical assistance. In October, 1977, SEAG signed an agreement with the National Development Bank in which the latter committed itself to supply credit for those farmers to whom SEAG provided technical assistance. Subsequently SEAG has been making comparable agreements with other credit and cooperative agencies so as to insure that farmers will have material inputs needed to carry out technological advances recommended by SEAG. This is a critical step to improving the overall services provided to small farmers. There are signs that this organizational approach is spreading rapidly because more and more intra-agency agreements are being signed to link Technical Assistance to Credit and other inputs.

In a broad sense the question of whether a farmer will find time to participate in the proposed project is not a viable one. It is true that labor shortages constrain the farmers time and productivity; however, it must be remembered that the whole purpose of this project is to find more efficient systems for farming within the agronomic and cultural limitations of the small farm environment. When farmers can see that they are likely to enjoy a direct benefit from a particular experiment or pilot project they will likely find time to work on it. This is confirmed by the joint experience of USAID and SEAG in the Small Farmer Livestock pilot projects created during the last few years. Only about 2% of the small farmers collaborating with these projects failed to follow through and abandoned them. USAID experience with other projects demonstrate that once small farmers become participants they continue to collaborate fully and enthusiastically because someone has taken a personal interest in them, perhaps for the first time.

There appear to be no major social political, religion, agronomic or ecological obstacles to project implementation. Probably the only one that need concern planners is the potential market disruption that might result if in fact small farm producers succeeded in meeting the increased yield goals of the Project. However, Paraguay's internal and external

markets for agricultural products are growing very rapidly. By 1985 the projected population of Paraguay will be 3,500,000 persons. This considerable increase will greatly expand the internal market and this project is particularly timely because it will ensure gradual increases in production to keep pace with national growth.

E. SPREAD EFFECTS AND COMMUNICATION

Although Paraguay has a governmental hierarchy which provides formal channels of authority and decision making, most of the decisions affecting small farmers are made at the local level within complex nongovernmental social structures. Comerciantes, or local merchants, and compañia money lenders, known as acopiadores or subacopiadores play the most critical role in the informal power structure. An anthropologically oriented study by Ned D. Ewart, a USAID contractor doing social analysis in 1977, confirms that merchants and small lenders plays a decisive role in the local social structure. Ewart's A Descriptive Ethnography of Paraguay observes that:

> These business (merchants and lenders) commercialize production for farmers in order to recuperate their debts as well as to make money in commercial activity. The farmer usually is not obligated to sell his crop to pay his debt....The relationship between a farmer and a businessman who gives him credit is an important form of the "patron" system in Paraguay. The credit giver is the "patron" and the credit receiver is a "cliente" or client... The "patron-peon" relationship in Paraguay is a purely voluntary association between a farmer and a merchant.

Ewart points out, correctly we believe, that the patron-peon relationship in Paraguay is not like that of Mexico or Perú where the relationship implies a great deal of overdependence on the patrón. The patronage system in Paraguay is distinctive because generally patrons do not exploit their clients for labor on lands belonging to the patrón rather than the peons. Even though this relationship is not overtly exploitive the merchants and lenders play an important role in influencing their clients.

The merchant/lenders group should be a positive force, rather than an obstacle, to the implementation of the proposed loan. As a whole this group demonstrates great interest in the welfare of the small farmer clients which it serves. It is in this group's interest to ensure that small farmers produce well, at least well enough to pay back their loans. In the past these patrons even provided technical assistance to their clients when none was forthcoming from the government. They did this, according to Ewart, to avoid crop failure and, hence, delinquent loans.

Analyses presently available to this Mission indicate that this identifiable patron group will not oppose a program which proposes to increase small farmer production, but will welcome it. In fact, during

program implementation it is believed that the MAG will work hand in hand with the patrons in the identification and distribution of appropriate technologies. Merchants should play a direct and positive role in the spreading of any new technologies which are successfully introduced and developed by the production field teams of the project. Ewart's social soundeness analysis indicates that the merchants and lenders would be happy to be relieved of the responsibility of providing direct technical assistance to their clients. They are more interested in providing other inputs.

In a basis sense this Project is primarily concerned with "the technology of technological innovation" that A.I.D. technician J. K. McDermott and other agricultural technicians have described. The project itself is a system for diffusing innovations. This spread effects and the Project per se are virtually synonymous. Because the complete Project Paper describes how the system to spread innovations will work there is little point in discussing it further in this sub-section. Suffice it to point out that there are other regions of Paraguay with target populations very similar to those being addressed by this Project. Such region will likely grow as the population grows, especially in the northern part of Paraguay and spreading out toward the Chaco. There will be ample opportunity and need for SEAG to expand its regional approach after the Project ends.

SOCIAL CONSEQUENCES AND BENEFIT INCIDENCE

In summary, the Project will assist small farmers to use the output of relevant agronomic, farm management and livestock research to increase annual output per hectare, using increasing amounts of labor as well as other inputs. Out of the higher incomes to be generated from sales of basic agricultural products smallholders will be able to mobilize for further investment. This will be accompanied by an increase of purchases by the farmer of new seeds, other agronomic inputs and consumer items. These increased purchases will in turn stimulate a general program to increase off-farm employment through small scale rural industry, such as the manufacture of technologically appropriate machinery.

Increased rural industry will expand the market for increased agricultural production and the production of simple goods, services and infrastructure that the farm family needs. As a result of this farm production begins moving more rapidly. Smallholders will use their limited supply of labor more efficient they will distribute that labor input more evenly throughout the calendar year and they will ultimately produce more with less. Effective demand will then increase again and again will provide the foundation for higher levels of agricultural production in Paraguay.

The proposed project will have positive rather than negative effects on employment in the agricultural sector. According to A Perspective of Employment and Occupations in Paraguay 1950-1984, agriculture will still

rank as the number one employer in Paraguay in 1983, the year the project is scheduled to end. By 1983, if present trends continue, about 25,000 more persons will earn their living from an agricultural activity. It is very unlikely, then that there will be increased rural displacement, increased migration or excessive urbanization. Increased urbanization would be a natural trend. However, in Paraguay there is little tendency to urbanize. That which might occur should have little effect on the economy as a shole, which will remain essentially agricultural in character.

Because the whole farm approach is taken by this Project women and children will benefit on an equal basis with men. About 24 percent of the minifundia farms are completely owned and managed by women anyway. Women and children are almost always fully charged with the care of livestock on every small farm, regardless of whether a man is head of the household. Because of the manner in which the project is to be carried out special care will be taken to assure that the work loads or other responsibilities of women and children are not increased due to particular technological changes on the farm.

The proposed project will inevitably increase the recipients' participation in local activities related to agricultural development. Because of their interaction with the local SEAG field teams beneficiaries will become involved with organizations which provide credit, organized marketing activities and private firms which supply agricultural inputs. In general the Project will bring about increased interaction between the recipients and the modernizing agents in Paraguayan society. This interaction alone should give the small farmer group access to an increasing amount of information regarding his welfare.

Finally, the donor and implementing agencies of the proposed program have no reason to conclude that (a) there is any obstacles in the social structure of the small farmer that will impede project goals, (b) there is any significant difference between the donors and recipients perception of these goals and (c) that acceptance of the proposed innovations will have significant adverse effects on the beneficiary group. The proposed project is designed with full recognition that (to quote AID CIRCULAR A 266, Social Analysis Conference): "If peasant asset management reflects an optimization strategy rather than the sheer weight of tradition, then development program must place far more emphasis on analyzing existing systems, identifying and making available technology and opportunities that are of substantive value in the context of the circumstances particular low income groups face...."

ANNEX V

ECONOMIC ANALYSIS

As indicated in the economic feasibility summary statement it was extremely difficult to establish clear-cut economic costs and benefits for this particular project. Nevertheless project designers completed the following cost/benefit analyses. These analyses are distinctive, and somewhat innovative, in that they quite clearly link economic considerations directly to the target group and target regions discussed in the Social Soundness Analysis. In the Social Analysis the minifundista families who will participate in the Project are located, enumerated and described. The economic annex goes a step further-in that it describes the agro-economic environment in which the intended beneficiaries live and the economic return that should accrue to them as a result of the Project.

In this cost/benefit analysis every effort has been made to objectively measure the economic rationality of proceeding with the proposed project. The most up-to-date data was used to complete this analysis and unless otherwise indicated it is for the 1975-76 crop year. Prices, areas cultivated, yields and national averages came largely from published and unpublished Ministry of Agriculture sources. Whenever possible these data were compared with independent studies done for USAID, such as the Small Farmer Sector Assessment, Cadastral maps, land tenure records and various reports of CPES, the Centro Paraguayo de Estudios Sociológicos. Computer data generated by the 1972 and 1976 Small Farmer Surveys was also used.

As more data becomes available for Paraguay the managers of this project may elect to locate the last four regional centers in areas other than those now indicated. This will give the Project needed flexibility while keeping it on a well-though-out implementation schedule. Thus, the seven regional zones analyzed in this economic annex appear to be the ones most indicated to benefit from assistance - although their selection remains tentative.

Having identified the location of the target group, and their characteristics, in the Social Soundness Analysis the Economic Analysis addresses the problem of how much the target group will benefit from the proposed Project. To do that 1976 crop production was analyzed in detail for every one of the 43 districts to be included in the project. Data from each of the districts was summed for each of the major crops under cultivation for each regional zone. In turn these weighted averages were compared to national average on a crop by crop basis.

Discrepancies between yield obtainable in Paraguay and actual yield obtained in the target regions thus became apparent. Comparisons of these yields confirm what the social analysis suggests, that farmers in these particular zones do poorly in production and earnings, even when compared to Paraguay's average, which is also low. The argument of the cost/benefit

analysis is that if yields of the crops now grown in the target region are, as a result of the project, increased just to the national yield level, the project will be economically viable. The data, included in Table 1 dramatically demonstrate the economic importance of such yield increases and do show that, even if local market prices are used, and held constant throughout the analysis, economic returns will be significant with the Project.

Before proceeding to the details of the calculations related to this cost/benefit analysis it is important to spell out the assumptions that dictated this particular methodology:

1. Since farm productivity in Paraguay has not been increasing and since small farmers have not previously benefitted from a program of applied research and extension aimed at increasing their efficiency, there is good reason to believe that the proposed Small Farm Technology Project can bring about substantial increases in productivity and outputs. Graph No. 1 in the Technical Annex demonstrates how static crop yields have remained in Paraguay.

2. It was assumed that it is agronomically and technically feasible for farmers in the target zones to increase their yields to the national level, if not higher. This is reasonable because soils, vegetation, water resources and eco-climatic conditions are relatively homogeneous throughout Eastern Paraguay. The Chaco region is distinct, of course, and production data from that zone are rarely included in national averages. Hence, it is assumed that yields obtained in one part of the country can be matched in another part, perhaps with a few inexpensive material inputs, but largely because of technological innovations.

The average difference in yields per hectare between the regional average and the national average for those items where the national average is higher amounted to 36% according to Table 2. Consequently our Project assumes an annual average compund rate of increase in yields of 3.1% over a 10 year period in order to achieve the increase in income per farm unit that was posited. While this rate of increase is high it is by no means unrealistic in terms of historical experience. Between 1952 and 1969 Japan achieved an average annual increase in crop yield per hectare of 2.3%; between 1952 and 1960 Taiwan achieved an average annual increase of 4.1% 1/.

3. It is reasonable to assume that this type of project will result in a decline in unit costs for farmers so that the postulated increase in output will not result in any substantial increase in aggregate farm costs for farmers adopting the recommended technology. The experience of the U.S.A. between 1939 and 1969 shows that total costs for an expanded volume of output were reduced by a third (compared to what they would have been with 1939 technology) as a result of new technology 2/. In completing the attached cost/benefit analysis no cost was ascribed to the technological inputs (other than the Project cost) on small farms.

1/ "Technological Change in Agriculture and Employment in Developing Countries" by Ydelman, Butler and Banerji, Development Center, OECD, Paris, 1971, p.105.

2/ Robert W. Long, "Perspective on Research and Education for Commercial Agriculture", American Journal of Agricultural Economics, 56(5), December 1974.

4. Since research requires time for its benefits to be realized, it was necessary to extend the period of cost/benefit analysis for a period of 5 years beyond the formal termination of the project in 1983. This assumes that the new technologies developed under the project will continue to have an expanding impact on the small farm population through the activities of SEAG extension agents. It also assumes that a minimum, regional yields, once raised to the national level, will be kept there throughout the LOP and beyond. For simplicity prices were kept constant, by crop, at the local level throughout the LOP and beyond. Under the reasonable assumption that benefits will continue to spread and that increases in production will continue to be realized on farms adopting new techniques until 1989 this is an extremely modest estimate of benefits to be derived under the Project.

5. For the period 1979-1983 it was assumed that benefits would accrue annually in direct proportion to the number of centers established. Thus in year 2 of the project only 3/7th of the benefits are attributable to the project. Obviously there is a lag and not all farmers will readily adopt new techniques as we predict. However, it was assumed that overall this was a simple and reasonable way to even out resulting benefits.

MEASUREMENT OF BENEFITS

After having made these general assumptions Table 1 was completed for the seven regional zones of influence (details of the limits of these zones are included on the spatial relationship maps attached to the Social Analysis). The following formula was then used to derive the dollar value of benefits steming from the Project: 3/

National average yield by crop K/Ha(5) - Average yield same crop in proposed project zone K/ha(3) X value ($/K) in zone of same crop(4) = Increased Value per ha resulting if technology brings yield to level of national average only. Then Increased Value per ha of same crop(6) X number of has. of that crop cultivated in same region(2) $\triangleq$ total increased $ benefits to that region that could be attributable to technological inputs(7)

or (5) - (3) x 4 $\triangleq$ 7

Then (6) x (2) $\triangleq$ 7

If SEAG's technology flows to all farms in the region, as it invariably will do because of mass media techniques to be employed, those who are not direct participants in the project will also benefit. To determine the annual increased benefits likely to accrue to each farm unit one places: total Increased $ Value of regional production(7) over the number of farms in the region(a). Thus 7/(a) $\triangleq$ 8. Then for the entire region one get the following results:

$$\frac{\$3,848,984}{96,146} = \$40.03$$ average per annum return on project per farm unit

3/ (1) $\triangleq$ crops, etc., as per Table 1

If one allows only 60% of this benefit to be ascribed to the Project because SEAG will reach only 60% of the farmers in the target region the annual benefit will be only $2,309,400 instead of $3,848,948. Cost/benefit Table 2 uses the lesser benefit figure. Thus, after adjustments to present values Table 2 indicates that if only 60% of the farmers in the target areas increased their annual production to the national average, the benefit-cost ratio would be 1.023. This was obtained using a 15% discount rate, the standard used by the USAID.

On the other hand, if all of the farmers in the target areas learn about new technologies through the mass communications component of the Project and they put such technologies into practice the benefit/cost ratio could be as high as 1.707. This assumes that all farmers in the region are able to raise their crop yields to Paraguay's national average throughout the life of the Project and five years beyond that.

Although these data are tenuous they do indicate that the Project will give an adequate cost/benefit ratio and perhaps one even much higher. If other variables, such as land area under cultivation or labor savings, were added to this analysis the ratio would likely be even higher than it is. Since the application of appropriate technology can affect the size of the areas under cultivation as well as output per hectare, we have endeavored to show below in six steps to what extent value added would be increased by raising the area under cultivation of the average farm unit by one half of a hectare. We have applied this calculation to the case in Table 2 where only 60% of the farmers in the target area are assumed to have been reached under the project.

(1) a = (72,980 hectares), the total area under cultivation by 60% of the farmers in the region at the beginning of the project.

(2) b = (57,688 farms), the number of farms operated by 60% of the farmers in the region at the beginning of the project.

(3) $\frac{a}{b}$ = X (1.27 hectares), the average number of cultivated hectares per farm in the region.

(4) X + 1/2 a hectare increases X by 39% (a value hereafter referred to as T).

(5) Z = ($2,008,205), the total net farm revenues of 60% of the farmers of the region.

(6) Z x T (39% of Z) = S, the net increase in farm revenue resulting from raising the area under cultivation and consequently net farm revenues by T.

Therefore the value added (S) equals $783,200 for the entire region. It is clear that if value added from increasing the area under cultivation were

added to that resulting from increasing per hectare yields, the cost/benefit ratio will appreciably exceed 1. Alternatively, one might deduce that the increase in value added from increasing the area under cultivation on the average farm by one hectare would offset a sizeable shortfall in the increase of output among farmers who failed to raise productivity to the national average level, so that despite some shortfall in productivity per hectare a positive cost/benefit ratio will still be attained. This simple example is intended to demonstrate that the spread of appropriate technology among small farmers will be beneficial because of: a) an increase in productivity; b) an increase in the area under cultivation or c) some combination of the two.

TABLE 1

AGRO-ECONOMIC PROFILE OF SEVEN TARGET AREAS AND BENEFITS

(a) Zones of Regional Center	(1) Crops	(2) Ha.Cultivated	(3) Regional Yield K/Ha	(4) Regional Price $/K	(5) Nat'l Yield K/Ha	(6) Likely Increased $Benefit/ha	(7) Total Increased Value Crop in Region $	(8) Minimum Annual Benefit Per Farm in Region $
Cordillera (year 1) Total farms: 17,233	Corn	10,226	1,067	0.050	1,366	14.95	153,477	
	Cassava	4,877	12,518	0.020	14,800	45.64	222,586	
	S.Cane	916	27,987	0.003	39,900	35.74	32,737	
	Beans	1,607	532	0.134	783	33.63	54,043	14.38
	Cotton	2,372	862	0.155	975	17.52	41,546	
							247,737	
Paraguari (year 1)	Corn	15,753.1	1,040	0.115	1,366	37.49	590,584	
	Cassava	3,498.0	17,100	0.042	14,800	-	-	
	Beans	4,857.6	616	0.356	783	59.45	288,794	52.09
	Cotton	7,167.6	947	0.307	975	8.50	61,613	
							940,991	
Encarnacion (year 1)	Soybeans	9,250.0	1,940	0.071	1,600	4.26	39,405	
	Corn	13,537.0	1,200	0.033	1,366	5.48	74,156	
	Wheat	4,503.4	470	0.062	1,100	39.06	175,903	21.68
	Cotton	3,050.8	930	0.158	975	7.11	21,691	
							311,155	
Central (year 2)	Cassava	2,916.8	7,750	0.042	14,800	296.10	863,664	
	S. Cane	1,229.9	32,000	0.007	39,900	55.30	68,013	75.91
							931,677	
Neembucu (year 2)	Corn	1,858.4	1,020	0.123	1,366	42.56	79,090	
	Cassava	293.8	4,500	0.004	14,800	865.20	254,166	
	Cotton	1,232.8	600	0.300	975	25.50	31,436	68.10
	Sweet Potatoe	273.2	3,610	0.100	8,280	467.00	127,584	
							492,306	
Caazapá (year 3)	Corn	6,398.9	1,140	0.088	1,366	20.77	132,892	
	Beans	1,783.7	680	0.345	783	35.54	63,384	
	Cassava	1,939.8	13,930	0.023	14,800	20.01	38,815	43.94
	Cotton	2,215.3	950	0.283	975	7.08	15,673	
	Soybeans	1,941.0	1,650	0.161	1,600	88.55	171,876	
	S. Cane	1,481.4	41,000	0.007	39,900	-	-	
							422,640	
Caaguazu (year 3)	Corn	9,216.0	1,170	0.107	1,366	20.97	193.278	
	Beans	2,152.0	760	0.346	783	1.04	2,234	
	Cassava	2,264.0	14,950	0.042	14,800	-	-	28.92
	Tobacco	3,591.5	1,170	0.407	2,380	85.47	306.966	
	S. Cane	333.9	40,080	0.007	37,900	-	-	
							502,478	

Sources: Various MAG Official Statistics published and unpublished, especially working sheets of 1976
Estimaciones por distrito production agropecuaria, Malarial (1967) and cadastral maps (1977-78). Exchange calculated at ₲130/US$1.00

TABLE 2

BENEFIT/COST CALCULATIONS
(Rounded off to nearest thousand)

Project Year	0	1	2	3	4	5	6	7	8	9	10
Calendar Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Annual Benefits $ (1978 prices)	-	-	988.4	1,648.9	2,309.4	2,309.4	2,309.4	2,309.4	2,309.4	2,309.4	2,309.4
Present Value-Benefits $ 1/	-	-	747.2	1,085.0	1,321.0	1,147.8	997.7	868.3	755.2	655.9	470.4
Annual Costs $ 2/ (1978 prices)	-	1,866.7	1,664.3	1,765.0	1,683.0	1,438.7	1,347.8	1,347.8	1,347.8	1,347.8	1,347.8
Present Value-Cost $	-	1,624.0	1,258.2	1,161.4	962.7	715.0	582.2	506.8	440.7	382.8	332.9

$\frac{8,148.5}{7,966.7}$ $\frac{\text{Present Value benefits}}{\text{Present value costs}}$ = C/B 1.023

1/ Excludes inflation factor. Benefits occuring if only 60% of area yield becomes equal to national average yield.

2/ Excludes inflation factor. Excludes current personnel. Contingencies are included where appropriate. Includes both A.I.D. and GOP costs.

Discount rate 15%.

TABLE 3

BENEFIT/COST CALCULATIONS

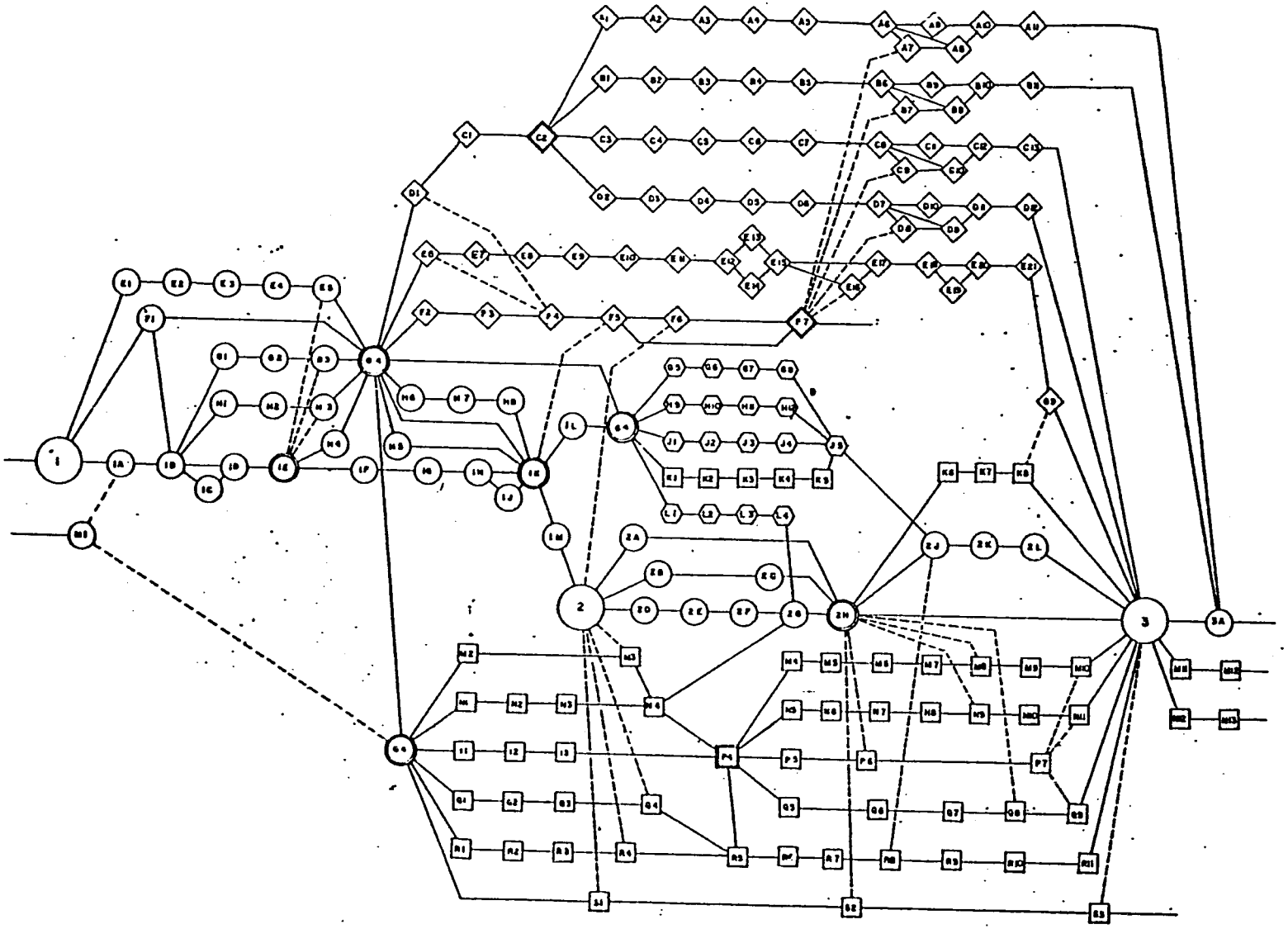
(Rounded off the nearest thousand)

Project Year	0	1	2	3	4	5	66	7	8	9	10
Calendar year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Annual Benefits $ (1978 prices)	-	-	1,647.4	2,748.2	3,849.0	3,849.0	3,849.0	3,849.0	3,849.0	3,849.0	3,849.0
Present Value-Benefits $ 1/	-	-	1,260.3	1,808.3	2,201.6	1,913.0	1,662.8	1,447.2	1,258.6	1,093.1	950.7
Annual Costs 2/ (1978 prices)	-	1,866.7	1,664.3	1,765.0	1,683.0	1,438.7	1,347.8	1,347.8	1,347.8	1,347.8	1,347.8
Present Value-Costs $	-	1,624.0	1,258.2	1,161.4	962.7	715.0	582.1	506.8	440.7	382.8	332.9

$$\frac{13,595.6}{7,966.} \quad \frac{\text{Present value benefits}}{\text{Present value costs}} = \text{C/B } 1.707$$

1/ Excludes inflation factor. Benefits occuring if all crop yields in area became equal to national average yield.

2/ Excludes inflation factor. Excludes current personnel. Contingencies are included where appropriate. Includes both A.I.D. and GOP costs.



PROJECT IMPLEMENTATION FLOW DIAGRAM

PREPARATORY PHASE

PROJECT IMPLEMENTATION FLOW DIAGRAM

PHASE I: PREPARATORY ACTIVITIES

PART I: SIGNING OF LOAN AGREEMENT AND APPOINTMENT OF KEY PROJECT STAFF

1	AID/W approves Project Paper and informs USAID
1 - 1A	USAID advises Ag. Minister and SEAG Director to proceed with project preparations.
(M1 - 1A)	SEAG Director and Admin. Staff, and MAG Administrator and other key MAG personnel available for project preparations.
1A - 1B	Ag. Minister assigns key personnel to work with USAID until Key Project staff is mobilized.

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1 - F1	USAID prepares initial draft of Loan Agreement
F1 - 1B	USAID distributes copies to Ag. Minister and Key Personnel
1B - 1D	USAID and MAG staffs jointly review Loan Agreement, and USAID prepares agreement in final.
1B - 1C	USAID Director and Ag. Minister fix date for signing Loan Agreement.
1C - 1D	MAG/SEAG arranges press (and TV) coverage of signing ceremony.
1D - 1E	USAID Director and Ag. Minister sign Loan Agreement.

1B - G1	Ag. Minister selects candidate for Project Director (It is assumed that SEAG Director will be Project Director.)
G1 - G2	Ag. Minister send candidates' biodata to USAID with letter formally requesting USAID approval.
G2 - G3	USAID formally approves candidate with letter to Ag. Minister.
(1E - G3)	(Loan Agreement signed).
G3 - G4	Ag. Minister appoints Project Director with Ministerial Decree.

1B - H1	Ag. Minister/SEAG Director select candidate for Project Administrator.
H1 - H2	Ag. Minister sends candidates' biodata to USAID with letter formally requesting USAID approval.

H2 - H3 USAID Director formally approves candidate with letter to Ag. Minister.

(1H - H3) (Loan Agreement signed)

H3 - G4 Ag. Minister appoints Project Administrator with Ministerial Decree.

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1 - E1 USAID prepares ProAg and PIO/T for grant funded Project Implementation and Administration Specialist.

E1 - E2 Ag. Minister and USAID Director sign ProAg.

E2 - E3 USAID forwards ProAg and PIO/T to AID/W (with names of proposed candidates, if any.)

E3 - E4 AID/W selects three qualified candidates and forwards their biodata to USAID.

E4 - E5 USAID selects candidate best qualified and AID/W negotiates contract.

(1E - E5) (Loan Agreement signed)

E5 - G5 Specialist instructed to mobilize and arrives in Asunción.

F1 - G4 USAID assigns Project Manager full time to Project.

Note: Key Project Staff consists of the following:

AID funded Project Manager
AID grant funded Project Implementation Adm. Specialist
GOP funded Project Director
GOP funded Project Administrator

PART 2: MEETING INITIAL CONDITIONS PRECEDENT TO LOAN

1E - H4 USAID prepares Implementation Letter No. 1 explaining conditions to be met for first disbursement of loan funds.

H4 - G4 USAID sends letter to Ag. Minister.

1E - 1F Ag. Minister formally presents Loan Agreement to GOP Congress. (Key Project Staff may be called upon to brief Congressional Committee on project.)

1F - 1G	GOP Congress ratifies Loan Agreement.
1G - 1H	President issues Executive Decree.
1H - 1K	GOP Attorney General prepares Legal Opinion declaring Loan Agreement a legal and binding obligation etc.
G4 - H6	Key Project Staff (KPS) prepares Project Budget Plan.
H6 - H7	Ag. Minister approves budget plan and presents plan to Minister of Finance.
H7 - H8	Minister of Finance approves Budget Plan (if required) and Ag. Minister formally presents plan to USAID.
H8 - 1K	USAID formally approves Project Budget Plan with Implementation Letter.
G4 - 1K	Ag. Minister sends USAID copies of Decree appointing Project Director and Project Administrator.
G4 - H5	Ag. Minister appoints Project Director, Project Administrator and MAG Administrator as his legal representatives for the Project.
H5 - 1K	Ag. Minister sends copies of Decree making appointments to USAID, along with specimen signatures.
1H - 1J	USAID sets date for AID Legal Advisor to review conditions precedent.
1J - 1K	AID Legal Advisor arrives Asunción
1K - 1M	AID Legal Advisor prepares legal opinion stating that each specific condition has been met for first disbursement. (Advisor departs)
1M - 2	USAID sends Implementation Letter to Ag. Minister formally stating that first conditions have been met.

PART 3: MEETING CONDITIONS PRECEDENT TO DISBURSEMENT OF LOCAL CURRENCY FUNDS FOR LOCAL PROCUREMENT AND OTHER SPECIFIC ITEMS.

G4 - N1 KPS selects candidates for Director of first three SEAG Regional Centers.

N1 - N2 KPS obtain Ag. Minister approval of candidates and submits bio-data to USAID.

N2 - N3 USAID approves candidates with Implementation Letter addressed to Ag. Minister.

N3 - N4 Ag. Minister appoints SEAG Regional Directors with Ministerial Decree.

N4 - 2G Project Director sends copies of Decree to USAID.

G 4 - L1 KPS prepares draft of Project Procurement Mannual and submits manual to Ag. Minister and MAG Administrator for approval.

L1 - L2 Ag. Minister approves manual with Ministerial Decree and KPS submits Manual to USAID for approval.

L2 - L3 USAID formally approves Project Procurement Manual with Implementation Letter.

L3 - L4 SEAG prints copies of Manual for distribution to Admin. Units.

L4 - 2G Project Director sends copy of printed Manual to USAID along with copy of Decree.

PART 4: MEETING CONDITION PRECEDENT TO DISBURSEMENT OF LOCAL CURRENCY FOR PROJECT OPERATION

1K - 1L USAID prepare Implementation Letter explaining conditions to be met for release of project operating funds.

1K - 1L USAID sends Implementation Letter to SEAG Project Director

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G-4 G5 KPS prepares Vehicle Control and Maintenance Manual and submits Manual to Ag. Minister and MAG Administrator for approval.

G5 - G6 Ag. Minister approves Manual with Ministerial Decree and KPS submits Manual to USAID for approval.

G6 - G7 USAID formally approves Vehicle Control and Maintenance Manual. with Implementation Letter.

G7 - G8 SEAG prints Manual and Vehicle Control/Maintenance Forms.

G8 - J5 Project Director sends copies of printed Manual to USAID along with copy of Decree.

G4 - H9 KPS prepare Per Diem and Travel Manual and submits manual to Ag. Minister and MAG Administrator for approval.

H9 - H10 Ag. Minister approve manual with Ministerial Decree and KPS submits manual to USAID for approval.

H10 - H11 USAID formally approves manual with Implementation Letter

H11 - H12 SEAG prints Per Diem and Travel Manual and related forms.

H12 - J5 Project Director sends copy of printed manual to USAID along with copy of Decree.

G4 - J5 KPS prepares Project Administration Manual and submit manual to Ag. Minister and MAG Administrator for approval.

J1 - J2 Ag. Minister approves manual with Ministerial Decree, and KPS submits manual to USAID for approval.

J2 - J3 USAID formally approves manual with Implementation Letter

J3 - J4 SEAG prints Project Administration Manual and related forms.

J4 - J5 Project Director sends copy of printed Manual to USAID, along with copy of Decree.

G4 - K1 KPS prepares draft contract for Private Audit Firm and obtain USAID approval of draft contract.

K1 - K2 KPS requests bids for audit services from several audit firms.

K2 - K3 KPS recives bids, selects best qualified firm and submit selection to Ag. Minister for approval.

K3 - K4 Ag. Minister approves selection and KPS negotiates contract with selected Firm (Subject to USAID approval)

K4 - K5 KPS submits contract to USAID for approval

K5 - J5 USAID formally approves contract with Implementation Letter.

J5 - 2J USAID prepares Implementation Letter declaring condition precedent to disbursement of local currency loan funds for Project Operations to be fulfilled.

Note: The borrower has recuring obligations to meet prior to disbursement of local currency loan funds in any Project Year.

PART 5: LOCAL CURRENT ACCOUNTS

2 - 2A KPS prepares letter (for Ag. Minister's signature) to Minister of Finance requesting first disbursement of GOP funds for the Project,

2A - 2H Minister of Finance receive letter and authorizes the deposit of funds into Project account at Central Bank

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2 - 2B KPS prepare letter (for Ag. Minister's signature) to Central Bank requesting Bank to open two accounts for the Project: One for GOP funds and one for AID loan funds.

2B - 2C Ag. Minister issues Ministerial Decree authorizing Project Director Project Administrator and MAG Administrator to sign checks from these accounts, obtain specimen signature, and sends them all to Central Bank.

2C - 2H Central Bank opens two numbered accounts and issues check books for each account. (Checks sign two signatures)

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2 - 2D KPS sends letter to USAID requesting Direct Reimbursement Approval (DRA)

2D - 2E USAID and AID/W approve request and USAID notifies SEAG.

2E - 2F KPS sends letter to USAID requesting first disbursement of local currency for local procurement and other specific items.

2F - 2G USAID requests check from AID/W and AID/W sends check (Minimum time is three weeks).

(24 - 2G) (Procurement Manual is approved and distributed)

(N4 - 2G) (First three Regional Directors are appointed)

2G - 2H USAID sends check to Ag. Minister, who endorses check, which is then deposited into Project account at Central Bank

2H - 3 Local Currency funds for Procurement are disbursed and accounted for according to Procedures set forth in Procurement Manual

2H - 2J KPS sends letter to USAID requesting first disbursement of local currency funds for Project operations.

(J5 - 2J) (Implementation Letter issued declaring conditions precedent to disbursement of operating funds has been met).

2H - 2J KPS requests first disbursement of local currency loan funds from USAID for operating expenditures identified in Project Budget Plan.

2J - 2K USAID requests check from AID/W and AID/W sends check. (Minimum time is three weeks).

2K - 2L USAID sends check to Ag. Minister, who endorses check, which is then deposited into Project account at Central Bank.

2L - 3 KPS activates Project rotating fund for operations using procedure outline in the Project Administration Manual.

PART 6: ORIENTATION OF REGIONAL DIRECTORS

(G4 - N4) (Regional Directors hired/appointed)

G4 - M2 KPS plan training tour for first three Regional Directors.

M2 - M3 USAID Project Manager prepares PIO/P

(2 - M3) (Conditions precendent to dollar disbufsement met)

(N3 - M3) (First three Regional Directors have been appointed by Ag. Minister and approved by USAID.)

M3 - N4 USAID purchases tickets and advance per diem for trip.

Note: Tickets may have to be purchased with GOP funds

N4 - P4 Three Regional Directors complete orientation training tour, and render accounts to USAID and to MAG Directorate of Administration

PART 7: CONTRACTING GRANT FUNDED LONG TERM ADVISORS

G4 - Q1 KPS prepares qualifications for Communication specialist, prepares draft contract, and advertises position.

Q1 - Q2 KPS receives application and selects best candidate.

Q2 - Q3 KPS submits selection results and draft contract to USAID for approval.

Q3 - Q4 USAID approves selection and draft contract with Implementation Letter.

(2 - Q4) (Conditions precedent to dollar disbursements have been met)

(M3 - Q4) (Dates of orientation tour have been established)

Q4 - R5 KPS negotiates final contract and Communication specialist arrives Asunción on specified date.

G4 - R1 KPS prepares qualifications for Extension Specialist, prepare draft contract, and advertises position.

R1 - R2 KPS receives applications and selects best candidate.

R2 - R3 KPS submits selection results and draft contract to USAID for approval

R3 - R4 USAID approves selection and draft contract with Implementation Letter.

(.2 - R4) (Conditions precedent to dollar disbursements have been met)

(M3 - R4) (Dates of orientation tour have been established)

R4 - R5 KPS negotiates final contract and Extension Specialist arrives Asunción on specified date.

Note: Contract for long term advisors will include provisions for direct payment by AID, following approval of bills by Project Director.

PART 8: LOCATION OF REGIONAL CENTERS AND LOCAL AGENCIES

(M1 - G4) (Initial funds available to SEAG for Preparatory Phase of Project)

G4 - P1 KPS and SEAG staff contact other ministries, agencies, office, etc. and complile list of maps, flows and other source data on land resources, land holdings and land tenancy.

P1 - P2 KPS/SEAG purchase/obtain copies of source data.

P2 - P3 SEAG staff prepares base maps of each Department showing minifundia areas, colonies, roads topography etc.

P3 - P4 KPS tentatively selects towns for Regional Centers and local Agencies.

(N4 - P4) (Regional Directors returned from training tour)

P4 - P5 KPS and Regional Directors visit selected towns and make final decision.

P5 - P6 Regional Directors locate office facilities and staff quarters in selected towns.

(2H - P6) (GOP Project funds deposited in Central Bank)

P6 - P7 KPS/Regional Directors negociate ent/Lease contracts for office and quarters.

Note: Final selection of local agencies will be made during first 3 to 6 months of operations at Regional Centers.

PART 9: PREPARATION OF OPERATIONS MANUAL, AND PLAN FOR FIRST YEAR OPERATIONS

(P4 - R5) (Regional Directors and source data available; sites of first three Regional Centers determined).

(Q4 - R5) (Communication Specialist on board)

(R4 - R5) (Extension Specialist on board)

R5 - R6 KPS/Regional Directors/Specialists prepare draft of Operations Manual to be used by Regional Centers and local agencies: (This should include descriptions of duties and responsibilities of the various positions)

R6 - R7 Draft of Manual presented to Ag. Minister who approves Manual

R7 - R8 Draft of Manual presented to USAID and USAID approves Manual with implementation letter.

R8 - R9 Operations Manual printed and distributed.

R9 - R10 KPS/Regional Directors/Specialists prepare draft plan of operations for Regional Centers and local agencies.

R10 - R11 Operations Plan review and approves by Ag. Minister and USAID (if necessary)

R11 - 3 Operation Plan pointed and distributed.

PART 10: HIRING REGIONAL STAFFS

P4 - Q5 KPS/Regional Directors prepare qualifications for Regional Staffs.

Q5 - Q6 KPS advertises positions and receives applications.

Q6 - Q7 KPS/Regional Directors select candidates and KPS submits their biodata to USAID.

Q7 - Q8 USAID approves Technical personnel with Implementation Letter.

(2H - Q8) (GOP Profit Funds deposited in Central Bank).

Q8 - Q9 SEAG/MAG contracts/hires personnel.

(Q7 - Q9) (Regional Office facilities and quarters available).

(G9 - Q9) (Vehicles available)

Q9 - 3 Regional staff for first three centers mobilize.

PART 11: LOCAL PROCUREMENT FOR FIRST THREE REGIONAL CENTERS

P4 - M4 KPS/RDs prepare list of office furniture for Regional and local offices.

(2G - M4) (Procurement Manual prepared)

M4 - M5 KPS/RDs prepare detailed specifications

M5 - M6 KPS requests bids and quotations

M6 - M7 KPS receives bids/quotations and selects suppliers.

M7 - M8 KPS prepares contract (and obtains USAID approval of contract)

(2H - M8) (Local currency loan funds deposited in Central Bank).

M8 - M9 KPS makes first payment and supplier initiates contract.

(P7 - M10) (Regional office facilities available).

M9 - M10 Supplier delivers furniture and receives final payment (Contract should stipulate delivery to Regional Centers)

P4 - N5 RD's prepare list of office supplies and other items needed for Regional and Local offices.

N5 - N6 KPS approves list and RD's prepare detailed specifications.

N6 - N7 KPS requests quotations.

N7 - N8 KPS receives quotations and selects suppliers.

N8 - N9 KPS prepares checks and necessary purchase orders.

(2H - N9) (Local currency loan funds deposited in Central Bank)

N9 - N10 KPS makes purchases as agreed.

(P7 - N10) (Regional office facilities available)

N10 - 3 SEAG delivers goods to Regional Centers.

PART 12: PURCHASE OF GAS CUPONS

2H - K6 KPS sends letter (signed by Ag. Minister) to Ministry of Finance requesting exhoneration of import duties on specified amount of gasoline (expressed in Guaraníes)

K6 - K7 Ministry of Finance issues import permit.

K7 - K8 KPS arranges with Esso/Shell to purchase gas cupons for the specified amount. (Esso/Shell then uses the import permit to reduce their import tax by the amount indicated).

K8 - 3 KPS distributes cupons to Regional Centers.

Note: The Vehicle Control Manual will provide detailed step-by-step instructions for control and accountability of each cupon.

PART 13: SHORT TERM IN-COUNTRY TRAINING - INITIAL PHASE

G4 - S1 KPS/SEAG identify initial training needs and determine how and when training is to be undertaken.

(2 - S1) (Conditions Precedent to Loan Met)

S1 - S2 KPS/SEAG select candidates identifying local instructors staff and make final arrangements, including costs etc.

(2H - S2) (Project Local Currency funds deposited in Central Bank).

S2 - S3 Series of initial short term courses undertaken

(S3 - 3) Trained Personnel available for first three Regional Centers.

3 Continuing activity with both local and imported instructor personnel.

PART 14: OPENING ACCOUNT WITH U.S. BANK

G4 - F2 KPS selects U.S. Bank (such as Riggs National Bank of Washington D.C.) to act as agent for dollar procurements with letters of credit.

F2 - F3 KPS writes selected Bank, explaining procedures involved.

F3 - F4 Bank sends letter accepting to be agent.

(D1 - F4) (A list of equipment, materials, supplies, spare parts etc. has been compiled by categories, such as Communications Equipment etc.)

(E6 - F4) (A list of vehicles has been compiled by categories, such as two-wheel drive 1/2 ton pick-ups etc.)

F4 - F5 KPS sends letter signed by Ag. Minister to USAID, along with lists of equipment and vehicles to be purchased, requesting Letter of Commitment for specified amount.

(1K - F5) (Project Budget Plan has been approved)

F5 - F6 USAID sends letter to AID/W requesting AID/W to open Letter of Commitment in selected Bank for specified amount.

(2 - F6) (Conditions precedent to dollar disbursements have been met and AID/W officially informed)

F6 - F7 AID/W opens Letter of Commitment

F5 - F7 KPS sends Bank names of two or three persons who will be authorized to open letters of credit, along with specimen signatures of named persons. (Project Director and Project Administrator should definitely be named)

Note: Bank should send Forms to be used to open Letters of Credit. If not, KPS should write and ask for them.

PART 15: VEHICLE PROCUREMENT

G4 - E6 Project Administration Division (PAD) prepare list of vehicles by categories, i.e. two-wheel drive 1/2 ton pick-ups etc.

E6 - E7 PAD sends out letters to local dealers and U.S. factory outlets requesting cataloge and other detailed reference material.

E7 - E8 PAD receives cataloge etc.

E8 - E9 PAD/KPS proposes detailed technical specifications for each type of vehicle to be purchased.

Note: Do not specify a particular brand vehicle or a particular type of engine, such as 4 cyl. engine. Use dimensions, HP range, etc., type of fuel etc.

E9 - E10 PAD sends out requests for bids (for each type vehicle) to local dealers, U.S. dealers and U.S. factory outlets.

Note: AID regulations may also require announcement in U.S. Commerce Business Daily.

E10 - E11 PAD receives bids, and maintain a record of bids received.

E11 - E12 KPS/SEAG/MAG formally open bids at specified time and date, and select supplier of each type of vehicle. (PAD keeps a record of proceedings, which is signed by those present. Also, GOP law require that a representative from Ministry of Finance be present at the opening.)

E12 - E13 KPS sends letter to USAID with results of selections and requests approval to open letters of credit.

E13 - E15 USAID approves requests by letter.

E12 - E14 KPS sends letter (signed by Ag. Minister) to Ministry of Finance requesting decree to import specific type vehicles.

E14 - E15 Ministry of Finance issues decree.

Note: GOP law requires import decree prior to ordering official vehicles.

E15 - E17 PAD notifies selected suppliers to proceed with order upon receipt of letter of credit from Bank.

E15 - E16 PAD requests U.S. agent Bank to issue letters of credit for specified amounts to selected suppliers.

(F7 - E16) (AID Letter of Commitment opened)

E16 - E17 Bank issues letters of credit to suppliers. (Bank sends copies of letters to PAD.)

E17 - E18 Upon receipt of letter of credit, supplier fulfils order and turns vehicles over to shipping agent.

E18 - E20 Agent ships vehicles and notifies PAD name of ship, arrival date etc.

E18 - E19 Supplier sends PAD original invoice, ocean bill of lading, etc.

Note: Supplier sends copies of documents to Bank and Bank then pays supplier, if all documents are in order. If documents are not in order, supplier notifies PAD and requests instructions.)

E19 - E20 PAD turns documents over to MAG customs agent who arranges for release of vehicles when they arrive.

E20 - E21 Customs agent release vehicles, which are delivered to local dealer representative for factory servicing.

E21 - G9 Local dealer representative assembles and services vehicles. (This is part of purchase price and must be done at no cost to customer. If factory has no representative in Asuncion, project should request refund of service charge.)

(K8 - G9 (Gas informs available)

G9 - 3 Vehicles are delivered to SEAG and to Regional Centers.

PART 16: OTHER DOLLAR PROCUREMENT

G4 - D1 Project Administration Division (PAD) and KPS propose detailed list of requirement, materials etc. by categories.

D1 - C1 PAD requests cataloge and other detailed reference material from suppliers:

Note: The Commercial Section of the U.S. Embassy can help provide names and addresses of U.S. suppliers.

C1 - C2 PAD receives cataloge etc.

C2 - D2 PAD/KPS prepare detailed technical specifications for communications equipment.

Note: The preparation of these specifications may require outside assistance.

D2 - D3 PAD sends out requests for price quotations direct to suppliers (Local dealers can participate as long as the letter of credit is in the name of a supplier outside Paraguay.)

D3 - D4 PAD receives price quotations, and maintains a record of those received.

D4 - D5 PAD/KPS/MAG select suppliers based on quotations:

Note: The best procedure is to request from unit prices and allow flexibility in inland and ocean/air freight cost estimates. Bank will only pay actual costs, and this procedure results in much lower prices and greater participation of small businesses.

D5 - D6 KPS sends letter to USAID with results and requests approval to open letter of credit.

D6 - D7 USAID approves selection procedure.

D7 - D9 PAD writes suppliers and informs them of selection and instructs them to proceed upon receipt of letter of credit from Bank.

D7 - D8 PAD request Bank to issue letters of credit to suppliers for specified amounts. (Allow 10% more for freight costs to avoid having to make ammendments to letters of credit. Bank only pays actual freight costs up to the amount specified.)

D8 - D9 Bank issues letters of credit to suppliers.

D9 - D11 Upon receipt of letter of credit, supplier fulfills order, makes shipment and sends original invoice, bill of lading etc. to PAD. (Supplier sends copies to Bank and Bank then makes payment)

D7 - D10 PAD informs MAG Directorate of Administration of selection results.

D10 - D11 MAG Directorate of Administration obtains import permit.

D11 - D12 Upon arrival of goods in Asuncion, MAG agent obtains release of goods from customs.

D12 - 3 Communications equipment delivered to SEAG and Regional Centers.

C2 - C3 PAD/KPS prepare detailed technical specifications for all other equipment, goods needed by SEAG and Regional Centers at the start of operations.

C3 - C13 Steps C3 through C13 are the same as steps D2 through D12.

C2 - B1 PAD/KPS prepare detailed technical specifications for other equipment needed for operation of Regional Centers and local agencies; that is not required to open Regional Centers, but which should be available after one or two months of operation.

B1 - B11 Steps B1 through B11 are the same as steps D2 through D12.

C2 - A1 PAD/KPS prepare detailed technical specifications for spar parts and other goods that can arrive after the Regional Centers and local agencies are in operation, is not absolutely essential to initiate operations.

A1 - A11 Steps A1 through A11 are the same as steps D2 through D12.

NOTE: To facilitate procurement actions the Project should have its own Post Office address and a cable address, such as SEAG ASUNCION PARAGUAY.

ANNEX VII

USAID/PARAGUAY's

DIRECTOR's 611(e) CERTIFICATION

The proposed Small Farm Technology Project will assist the GOP to improve the ability of its Agricultural Extension Service, SEAG, to identify the technology needs of small farmers and to respond to those needs with greater efficiency and effectiveness. The Project will finance SEAG's operating and investment costs necessary to decentralize its structure, adopt more cost efficient outreach techniques, and strengthen its linkage with other agricultural sector entities concerned with improving small farmer technology. Consequently, the staffing and budget resources necessary for SEAG to implement the Project have been fully identified. Provision has been made to assure the continued availability of these resources. Moreover, the technologies to be developed will be specifically tailored to the needs and capabilities of SEAG's small farmer clients.

Taking into account the above and the maintenance and utilization of Projects in Paraguay previously financed or assisted by the United States, I hereby certify that Paraguay has the financial and human resources to effectively maintain and utilize the Small Farmer Technology Project.

Abe M. Peña
Director
USAID/Paraguay

ANNEX VIII

5C(2) - PROJECT CHECKLIST

Listed below are, first, statutory criteria applicable generally to projects with FAA funds, and then project criteria applicable to individual fund sources: Development Assistance (with a sub-category for criteria applicable only to loans); and Security Supporting Assistance funds.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? IDENTIFY. HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT.

1. App. Unnumbered; FAA Sec. 653(b)

(a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that figure plus 10%)?

1. (a) and (b). This project was part of the Congressional Presentation. Congress will be notified of the change in the name and amount.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

2. (a) Yes. (b) Yes.

3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

3. The only legislative action necessary is ratification by the Paraguayan Congress of the Loan Agreement. This is expected to be done in a timely fashion, based on past USAID experience.

4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per Memorandum of the President dated Sept. 5, 1973 (replaces Memorandum of May 15, 1962; see Fed. Register, Vol 38, No. 174, Part III, Sept. 10, 1973)?

4. Not applicable.

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?

5. Mission Director has so certified.

A.

6. FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multilateral organizations or plans to the maximum extent appropriate?

6. Project is not susceptible of execution as part of a regional or multilateral project. It is not expected that this project will encourage regional development programs since it is designed to promote the development of areas wholly within Paraguay.

7. FAA Sec. 601(a); (and Sec. 201(f) for development loans). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

7. The Project will have a direct impact on item (e) by increasing the delivery of technology to small farmers. Indirect impacts will be made on items (a), (b), and (c) by increasing agricultural production and farmer income. No or negligible Project impacts will be made on items (e) and (f).

8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

8. Procurement of goods and services will be provided under the loan by U.S. individuals or firms and will also be open to Code 941 individuals and firms.

9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.

9. Paraguay is contributing approximately $3.7 million in local currency to the project.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?

10. No.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?

B. 1. (a) The Project will decentralize the agricultural extension agency, SEAG, in order to improve access of the rural poor at the local level and to spread investment to small towns and rural areas, by making possible the more profitable use of unskilled labor. (b) The project will improve the economic well being of actual and potential cooperative members, thereby strengthening the rural base of cooperatives.

B1

b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: [include only applicable paragraph -- e.g., a, b, etc. -- which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.]	b. Assistance is being made available.
(1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers;	(1)(103) For rural development. The Project is specifically designed to increase the delivery of appropriate technologies to poor farm farmilies. Project expenditures' on agricultural research fully takes into account the needs of small farmers.
(2) [104] for population planning or health; if so, extent to which activity extends low-cost, integrated delivery systems to provide health and family planning services, especially to rural areas and poor;	N/A
(3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;	N/A
(4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:	N/A
(a) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;	
(b) to help alleviate energy problem;	
(c) research into, and evaluation of, economic development processes and techniques;	
(d) reconstruction after natural or manmade disaster;	
(e) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;	
(f) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.	

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(5) [107] by grants for coordinated private effort to develop and disseminate intermediate technologies appropriate for developing countries.

N/A

c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

c. Yes, Paraguay will contribute approximately $3.7 million to the project. The GOP's loan request provides assurances that it will provide at least 25% of the costs of the project for which the loan is to be made (see Project Financial Analysis Section of PP).

d. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing?

d. No.

e. FAA Sec. 207; Sec. 113. Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.

e. The Project will contribute directly to the objectives reflected in items (1), (2), (3), and (5). The implementing agency, SEAG, is an important economic institution for promoting the increased agricultural production necessary to meet the country's food needs. The Project will assist SEAG in improving its planning and administration abilities.

f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.

f. Paraguay's small farmers have consistently indicated a desire for greater technical assistance. Through training and consulting services the Project will assist Paraguayan officials of SEAG to undertake institutional improvements. The Project is designed to permit small farmers to participate in pilot research projects the results of which will influenc SEAG's planning and programming.

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g. FAA Sec. 201(b)(2)-(4) and -(8); Sec. 201(e); Sec. 211(a)(1)-(3) and -(8). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?

g. The Project gives reasonable promise of contributing to the development of: (a) the productive capacity of small farmers, thereby promoting self sustaining growth; and (b) the principal GOP institution concerned with promoting improved farm technologies. The project complements other development activities such as agricultural credit and its institutional development focus will contribute to long range objectives. A discussion of these items is given in the PP, which provides information and conclusion on the project's economic and technical soundness.

h. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position.

b. Certain goods and services are expected to be procured from the United States. The project's effect on the U.S. balance of payments will be de minimus.

2. Development Assistance Project Criteria (Loans only)

a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.

2.a. The project has been discussed with other donors and no financing is available. The project is not of the type to be attractive for private financing.

b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.

b. (1) Experience with other loans and future economic prospects for Paraguay indicate satisfactory capacity for loan repayment. (2) Loan and its terms are reasonable and legal under U.S. and Paraguayan laws.

c. FAA Sec. 201(e). If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds $100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?

c. Such application has been received.

d. FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?

d. Yes, PP does so describe.

e. FAA Sec. 202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources?	e. $2.45 mm will be used for imported equipment from private sources, $473 m will be used to purchase materials locally from private sources, $1.2 mm will be used for technical assistance expected to be procured from private sources.
f. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?	f. Assistance is not for any productive enterprise which will compete in the U.S. with U.S. enterprise.
3. Project Criteria Solely for Security Supporting Assistance	
FAA Sec. 531. How will this assistance support promote economic or political stability?	N/A
4. Additional Criteria for Alliance for Progress	
[Note: Alliance for Progress projects should add the following two items to a project checklist.]	
a. FAA Sec. 251(b)(1), -(8). Does assistance take into account principles of the Act of Bogota and the Charter of Punta del Este; and to what extent will the activity contribute to the economic or political integration of Latin America?	4. a. Project supports principles of the Act of Bogotá by having as its primary objective the improvement of rural living through delivery of appropriate small farm technologies. It supports the principles of the Charter of Punta del Este by supporting a rapid and equitable economic development in rural areas. The Project will increase the amount of agricultural products that Paraguay will have to export to other LA countries.
b. FAA Sec. 251(b)(8); 251(h). For loans, has there been taken into account the effort made by recipient nation to repatriate capital invested in other countries by their own citizens? Is loan consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress (now "CEPCIES," the Permanent Executive Committee of the OAS) in its annual review of national development activities?	b. Paraguay has made no attempt to repatriate capital invested in other countries by its citizens since it has had no problem of foreign exchange or flight capital. The loan is consistent with CEPCIES recommendations.

ANNEX IX

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

Name of Country: PARAGUAY

Name of Project: Small Farm Technology
Number of Project: 526-0109

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a Loan and Grant to the Republic of Paraguay, the "Cooperating Country" of not to exceed six million United States Dollars ($6,000,000), the "Authorized Amount", to help in financing certain foreign exchange and local currency costs of goods and services required for the Project. The "Project" consists of increasing small farmer income through institutionalization of mechanisms for the identification, development, application and dispersion of technologies appropriate to small farm use. Of the Authorized Amount, five million dollars ("Loan") will be loaned to the Cooperating Country to assist in financing certain Foreign Exchange and local currency costs of goods and services required for the Project and one million dollars ("Grant") will be granted to the Cooperating Country to assist in financing the Foreign Exchange costs of training and technical assistance. The entire amount of the A.I.D. financing herein authorized for the Project will be obligated when the Project Agreement is executed.

I hereby authorize the initiation of negotiation and execution of the Project Agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority subject to the following essential terms and covenants and major conditions; together with such other terms and conditions as A.I.D. may deem appropriate:

a. Interest Rate and Terms of Repayment

The Cooperating Country shall repay the Loan to A.I.D. in United States Dollars within twenty (20) years from the date of first disbursement of the Loan, including a grace period of not to exceed ten (10) years. The Cooperating Country shall pay to A.I.D. in United States Dollars interest from the date of first disbursement of the Loan at the rate of (a) two percent (2%) per annum during the first ten (10) years, and (b) three percent (3%) per annum thereafter, on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

b. Source and Origin of Goods and Services

Except for Ocean Shipping and as provided in paragraph "h" below, goods and services loan financed by A.I.D. under the Project shall have their source and origin in countries included in A.I.D. Geographic Code 941 or in Paraguay except as A.I.D. may otherwise agree in writing. Ocean Shipping financed under the Loan shall be procured in any eligible source country

except the Cooperating Country. Goods and services Grant financed by A.I.D. shall be of United States source and origin except to the extent hereinafter waived to Code 941.

c. Conditions Precedent to Initial Disbursement (Except Long Term Technical Assistance)

Prior to any disbursement or the issuance of any commitment documents in respect to Loan or Grant funds, (with the exception of long term technical assistance) the Cooperating Country (hereinafter referred to as the "Borrower") shall furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(1) Evidence of the appointment of a project director and a full time project administrator satisfactory to A.I.D.

(2) A detailed time-phased Project Budget and Staffing Plan broken down by Project year.

(3) Evidence assuring that Borrower contributions for the first year will be available.

(4) A general operations manual respecting SEAG institutional changes, decentralization objectives, Project focus and implementation, and the detailed procedural and administrative manuals to be developed.

(5) A time phased Project Implementation Plan.

d. Conditions Precedent to Disbursement for Grant Funded Technical Assistance

(1) Prior to disbursement or the issuance of any commitment document in respect of grant funds for long term technical assistance the Borrower shall submit to A.I.D. in form and substance satisfactory to A.I.D. evidence of the appointment of a Project Director and a full-time Project Administrator satisfactory to A.I.D.

(2) Prior to the disbursement or the issuance of any commitment document in respect of grant funds for any particular technical assistance activity A.I.D. shall have approved a written contract for such activity.

e. Conditions Precedent to Specific Project Activities

Prior to disbursement or the issuance of any commitment document in respect of Loan or Grant funds for the following specific activities, the Borrower shall submit to A.I.D., in form and substance satisfactory to A.I.D., the documentation described below:

(1) For farm management activities, a detailed operating plan covering the first two years of this activity.

(2) For any training activity, a training plan with corresponding operating manual for in-country training and a standard form loan agreement to be signed by long term participants.

(3) For local procurement of office equipment, furniture, supplies and other goods:

(a) evidence of appointment of directors satisfactory to A.I.D. for the first three regional centers; and

(b) copies of Project procurement manuals.

(4) For SEAG Project operating costs other than for farm management activities:

(a) the information necessary to demonstrate that the first three regional centers are ready to begin operations; and

(b) copies of the administrative manuals to be used by SEAG (respecting vehicles, fuel coupons and per diem and other travel allowances) and other manuals as may be necessary for Project implementation.

(5) For the small farm mechanization activity:

(a) an agreement between SEAG and the Agro-Mechanical School of Caacupé (EAMC) respecting implementation, and

(b) evidence that arrangements have been made to assure adequate technical assistance to the EAMC.

(c) a research plan describing the current state of appropriate technology research worldwide, and what kinds of appropriate technology the new unit in the EAMC will focus on to avoid duplication.

(6) For the seed production activity, an agreement between SEAG and SENASE respecting implementation arrangements.

(7) For problem solving research activities to be carried out by entities other than SEAG, an agreement between SEAG and each such entity respecting implementation arrangements.

f. Conditions Precedent to Disbursement for Local Costs for Each Project Year (After First Year)

Prior to any disbursement or the issuance of any commitment document in respect of local costs under the loan for each Project year subsequent to the first year, Borrower shall, except as A.I.D may otherwise agree in writing, provide to A.I.D., in form and substance satisfactory to A.I.D.,

(1) a staffing plan, indicating the current staffing levels of SEAG, and the additions expected during the year;

(2) evidence that there has been included in the National Budget an amount for the Project no less than that stipulated in the Budget Plan as Borrower's contribution for the Project year;

(3) evidence that all funds for the Project so budgeted for prior years have been released for use by SEAG.

g. Required Covenants

The Borrower shall covenant, in addition to standard covenants, that:

(1) The Borrower will authorize, or cause to be authorized, the new staff positions necessary to carry out the Project as planned with a salary structure adequate to attract and maintain qualified personnel in such positions.

(2) The Borrower will maintain SEAG's operating budget in real terms at least at the level of the last year of the Project for at least 5 additional years or until A.I.D. and the Borrower agree otherwise.

h. Waivers

The following waivers to A.I.D. regulations are hereby approved:

(1) The motorcycles contemplated to be purchased with A.I.D. financing, not being of the type presently manufactured in the United States, may be of Code 935 source, origin and manufacture.

(2) Grant funds may be utilized to procure short term technical assistance services and training services from Code 941 sources given (1) the language proficiencies required, (2) the cost savings resulting from short distance travel to and from other Latin American countries, and (3) the existence of similar programs in such countries.

Clearances:

	Typed Name	Office Symbol	Date	Initials
A.				
B.				
C.				
D.				
E.				
F.				

Signature: _____

Abelardo Valdez
Assistant Administrator for
Latin America

ANNEX X

Non-official translation, letter from GOP to USAID

Asunción, May 3, 1978

Mr. Abe M. Peña, Director
U.S. AID Mission to Paraguay

Dear Sir:

I am very pleased to confirm, on behalf of the Paraguayan Government, the contacts held by USAID/Paraguay and Ministry's officials as part of a joint effort to design a project based mainly on research and extension with the objective of developing and diffusing farm technology to improve the economic and social status of the small farmer.

As a next step, considering that the final stages of definition are well underway, I hereby officially request from the U.S. Government, on behalf of the Paraguayan Government, a loan in the amount of $ 5 million and a $ 1 million grant for the use of this Ministry.

The total amount of the loan will be used exclusively to carry out activities under the above mentioned project. The agency charged with and responsible for their implementation will be the Agriculture and Livestock Extension Service (SEAG). Of the $ 5 million total, $2,903,500 will be earmarked for SEAG's capital investments and operating expenses (travel expenses, per diem, local purchases, etc.); $442,400 for training programs; $140,000 to finance specific research to be conducted by the National Agronomic Institute (IAN) or other organizations; $319,100 for the development of equipments adapted to the needs of the small farmer and the manufacturing of prototypes by the Agromechanical School in Caacupé; $450,000 for the establishment of a revolving fund in the National Seed Service (SENASE) for the supply and distribution of seeds adapted for the use of small farmers; $72,800 to upgrade and reorganize SEAG's administration according to the new needs; $261,000 to finance part of the technical assistance, consultants, etc.; and $411,200 as adjustment for inflation.

Of the $ 1 million grant, $830,000 will be earmarked to contract the services of 8 worker/years in long and short term advisors who will provide technical assistance prior to and during the implementation of the project; $55,200 for training programs prior to implementation of the project; and $114,800 as adjustment for inflation. I want to point out that, given the great complexity of this project, the donation is deemed very important considering that it will facilitate critical

technical assistance prior to and during project implementation.

Regarding the counterpart funds required for the loan, I am pleased to inform you that I have taken the necessary steps to secure a formal commitment from the Ministry of Finance to allocate a total of ₲448,207,000 thereof. As you are already aware, the 1978 National Budget has included ₲ 61,938,000 as a first year counterpart contribution to the project. Given these experiences, I feel reasonably assured not to anticipate any future difficulty in this respect.

Finally, Mister Director, I would like to express my sincere appreciation for USAID/Paraguay's valuable and permanent assistance to this Ministry. Also, I expect you are going to do your best to make viable the approval of this project, which is so important for the development of the small farmer, a key majority in the Paraguayan economy.

Sincerely,

Hernando Bertoni
Minister

MINISTERIO DE AGRICULTURA Y GANADERIA

Asunción, 3 de mayo de 1978

S. Nº 177

Señor
Dr. Abe M. Peña, Director
Misión Económica de los EE. UU. en el Paraguay
Presente

Tengo el agrado de dirigirme a usted con el objeto de confirmar, en nombre del Gobierno Paraguayo, los contactos mantenidos entre funcionarios de USAID/Paraguay y de este Ministerio como parte de un esfuerzo conjunto tendiente a diseñar un proyecto que contemple principalmente la investigación y extensión con el objeto de desarrollar y difundir una tecnología agrícola destinada a mejorar la situación económica y social del pequeño agricultor. El proyecto propuesto, sin lugar a dudas, constituirá un gran aporte a uno de los sectores prioritarios en los planes de desarrollo del Gobierno Nacional.

Como siguiente paso, considerando los detalles del proyecto ya han llegado a la etapa final de definición, vengo por la presente a solicitar oficialmente en nombre del Gobierno del Paraguay, un préstamo por la suma de US$ 5.000.000 (CINCO MILLONES DE DOLARES ESTADOUNIDENSES) y una donación por la suma de US$ 1.000.000 (UN MILLON DE DOLARES ESTADOUNIDENSES) del Gobierno de los Estados Unidos de América, para uso de este Ministerio.

El monto total del préstamo será destinado exclusivamente a las actividades a realizarse bajo el proyecto antes mencionado, y la dependencia encargada y responsable de la ejecución de las mismas será el Servicio de Extensión Agrícola Ganadero (SEAG). De este total de US$ 5.000.000, US$ 2.903.500 serán destinados para inversiones de capital y gastos operativos (gastos de viaje, viáticos, compras locales, etc.) del SEAG; US$ 442.400 para programas de entrenamiento; US$ 140.000 para el financiamiento de investigaciones específicas a ser realizadas por el Instituto Agronómico Nacional (IAN) o por otras entidades, US$ 319.100 para el desarrollo de maquinarias adaptadas a las necesidades del pequeño agricultor y

la fabricación de prototipos por la Escuela Agromecánica de Caacupé; US$ 450.000 para el establecimiento de un fondo rotativo en el Servicio Nacional de Semillas (SENASE) para la provisión y distribución de semillas apropiadas para el uso del pequeño agricultor; US$ 72.800 para mejorar y reorganizar la administración del SEAG de acuerdo a las nuevas necesidades; US$ 261.000 para financiar parte de la asistencia técnica, consultores, etc.; y US$ 411.200 para ajuste de inflación.

De la donación de US$ 1.000.000, US$ 830.000 se destinarán para contratar los servicios de 8 hombres/año de expertos residentes y otros expertos que prestarán servicio por corto tiempo para dar asistencia técnica antes y durante la etapa de ejecución del proyecto; la suma de US$ 55.200 será destinada a sufragar el costo de programas de entrenamiento previos a la ejecución del proyecto; y US$ 114.800 para ajuste de inflación. Además, dada la gran complejidad de este proyecto, quisiera señalar la enorme importancia que atribuyo a este aporte, considerando que a través del mismo se facilitará la asistencia técnica tan crítica en la etapa previa a la ejecución y durante la ejecución del mismo.

Con relación a los fondos de contrapartida requeridos para el préstamo, me place informarle que he tomado las providencias necesarias para obtener el compromiso formal del Ministerio de Hacienda para la asignación de un total de ₲. 448.207.000 en dicho concepto. Como el Señor Director ya lo sabrá, el Presupuesto Nacional aprobado para el año 1978 ya incluye ₲. 61.938.000 como aporte de contrapartida correspondiente al primer año del proyecto. Dados estos antecedentes, creo tener suficientes motivos para no anticipar ninguna dificultad futura en este respecto.

Para terminar quisiera expresar al Señor Director mis más sinceros reconocimientos por la valiosa y permanente asistencia brindada por USAID/Paraguay a este Ministerio. Espero, además, que el Señor Director haga todo lo posible para hacer viable la aprobación de este proyecto tan importante para el desarrollo del pequeño agricultor, cifra mayoritaria y fundamental en la economía del Paraguay.

Sin otro particular aprovecho la oportunidad para saludarle muy atentamente.

MINISTRO

UNATTACHED ANNEX A

SMALL FARM TECHNOLOGY PROJECT

B U D G E T

Table of Contents

TABLE 1

Overall Budget Breakdown by Category
(US$ 000)

	A I D			GOP	
	$	¢	Total	¢	Total
Extension	2,382.0	829.7	3,211.7	3,341.5	6,553.2
Training	380.0	117.6	497.6	-	497.6
Purchased Research	-	166.0	166.0	-	166.0
Mechanization	67.8	297.3	365.1	98.0	463.1
Seed Multiplication	-	450.0	450.0	100.0	550.0
Administration	60.0	12.8	72.8	117.7	190.5
Technical Assistance	1,075.2	161.6	1,236.8	-	1,236.8
Totals	3,965.0	2,035.0	6,000.0	3,657.2	9,657.2

NOTE: Includes inflation and contingency within the categories as appropriate. (See category breakdowns.) Excludes current personnel. All computations in this budget were made at an exchange rate of ¢126=$1 US.

The $6,000,000 AID portion includes $5 million in loan funds and $1 million in grant. The grant will finance the following foreign exchange items: $944,800 in Technical Assistance (all the long term assistance and a portion of the short term advisors) and $55,200 in Training (all first year dollar financed training and the observation visits of the second year). A yearly breakdown of grant and loan expenditures can be found in the text of the Project Paper.

TABLE 2A

Budget Breakdown by Category by Year
Year 1 (US$ 000)

	A I D			GOP	
	$	¢	Total	¢	Total
Extension	1,132.4	122.9	1,255.3	29.5	1,284.8
Training	45.2	14.7	59.9	-	59.9
Purchased Research	-	20.0	20.0	-	20.0
Mechanization	39.5	66.0	105.5	7.1	112.6
Seed Multiplication	-	150.0	150.0	20.0	170.0
Administration	30.0	12.8	42.8	14.6	57.4
Technical Assistance	159.0	3.0	162.0	-	162.0
Totals	1,406.1	389.4	1,795.5	71.2	1,866.7

TABLE 2B

Year 2 (US$ 000)

	A I D			GOP	
	$	¢	Total	¢	Total
Extension	371.6	165.8	537.4	319.0	856.4
Training	77.2	28.2	105.4	-	105.4
Purchased Research	-	32.4	32.4	-	32.4
Mechanization	6.1	52.1	58.2	15.9	74.1
Seed Multiplication	-	150.0	150.0	20.0	170.0
Administration	30.0	-	30.0	18.8	48.8
Technical Assistance	440.6	45.4	486.0	-	486.0
Totals	925.5	473.9	1,399.4	373.7	1,773.1

TABLE 2C

Budget Breakdown by Category by Year

Year 3 (US$ 000)

	A I D			GOP	
	$	¢	Total	¢	Total
Extension	439.1	217.8	656.9	643.8	1,300.7
Training	109.2	36.8	146.0	-	146.0
Purchased Research	-	35.8	35.0	-	35.0
Mechanization	6.5	55.8	62.3	17.6	79.9
Seed Multiplication	-	150.0	150.0	20.0	170.0
Administration	-	-	-	23.7	23.7
Technical Assistance	226.3	24.5	250.8		250.8
Totals	781.1	519.9	1,301.0	705.1	2,006.1

TABLE 2D

Year 4 (US$ 000)

	A I D			GOP	
	$	¢	Total	¢	Total
Extension	247.5	215.2	462.7	1,038.0	1,500.7
Training	95.2	38.0	133.2	-	133.2
Purchased Research	-	37.8	37.8	-	37.8
Mechanization	8.1	59.7	67.8	27.1	94.9
Seed Multiplication	-	-	-	20.0	20.0
Administration	-	-	-	29.1	29.1
Technical Assistance	200.3	64.2	264.5	-	264.5
Totals	551.1	414.9	966.0	1,114.2	2,080.2

TABLE 2E

Budget Breakdown by Category by Year

Year 5 (US$ 000)

	A I D				
	$	¢	Total	¢	Total
Extension	191.4	107.9	299.3	1,311.4	1,610.7
Training	53.2	-	53.2	-	53.2
Purchased Research	-	40.8	40.8	-	40.8
Mechanization	7.6	63.7	71.3	30.1	101.4
Seed Multiplication	-	-	-	20.0	20.0
Administration	-	-	-	31.5	31.5
Technical Assistance	49.0	24.5	73.5	-	73.5
Totals	301.2	236.9	538.1	1,393.0	1,931.1

NOTE: The above budget breakdowns include inflation and contingency within the categories as appropriate (see category breakdowns). Excludes current personnel.

TABLE 3

Budget Breakdown by Year
(US$ 000)

Year 1	1,406.1	389.4	1,795.5	71.2	1,866.7
Year 2	925.5	473.9	1,399.4	373.7	1,773.1
Year 3	781.1	519.9	1,301.0	705.1	2,006.1
Year 4	551.1	414.9	966.0	1,114.2	2,080.2
Year 5	301.2	236.9	538.1	1,393.0	1,931.1
Totals	3,965.0	2,035.0	6,000.0	3,657.2	9,657.2

NOTE: Includes inflation and contingency. Excludes current personnel.

TABLE 4

Recurring Cost Budget

Constant Dollars (US$ 000)

	Total Cost of the Project (see Note)					
	Year 1	Year 2	Year 3	Year 4	Year 5	Thereafter Recurring
Extension	1,284.8	792.9	1,115.1	1,191.3	1,183.9	1,179.7
Training	59.9	105.4	146.0	133.2	53.2	25.0
Purchased Research	20.0	30.0	30.0	30.0	30.0	30.0
Mechanization	112.6	68.6	68.6	75.4	74.5	70.0
Seed Multiplication	170.0	170.0	170.0	20.0	20.0	20.0
Administration	57.4	47.4	20.3	23.1	23.1	23.1
Technical Assistance	162.0	450.0	215.0	210.0	54.0	-
Totals	1,866.7	1,664.3	1,765.0	1,683.0	1,438.7	1,347.8

NOTE: Excludes inflation factor. Excludes current personnel. Contingency is included within the individual category budgets where appropriate. Includes both AID and GOP.

TABLE 5

Extension

(US$ 000)

	A I D			GOP	Total
	$	¢	Total	¢	
Personnel - Current	-	-	-	1,406.2	1,406.2
- New	-	-	-	1,720.8	1,720.8
Furniture	29.3	80.7	110.0	-	110.0
Equipment	516.0	50.4	566.4	-	566.4
Vehicles	945.9	-	945.9	-	945.9
Fuel	-	187.4	187.4	161.7	349.1
Lubricants	-	19.9	19.9	17.1	37.0
Maintenance	34.4	27.1	61.5	53.0	114.5
Parts	146.7	-	146.7	22.3	169.0
Insurance	-	79.2	79.2	68.2	147.4
Materials	253.0	17.3	270.3	96.8	367.1
Agricultural inputs	26.3	-	26.3	78.8	105.1
Livestock inputs	39.4	-	39.4	118.3	157.7
Home Ec. inputs	-	31.3	31.3	28.2	59.5
Rent	-	36.8	36.8	65.7	102.5
Per Diems	-	107.7	107.7	212.0	319.7
Farm Management	-	10.8	10.8	21.6	32.4
Contingency	199.1	64.8	263.9	-	263.9
Inflation	191.9	116.3	308.2	677.0	985.2
Totals	2,382.0	829.7	3,211.7	4,747.7	7,959.4

GOP counterpart excluding current personnel: $3,341.5.

Total cost excluding current personnel: $6,553.2.

Total cost at current prices (i.e., excluding inflation adjustment), excluding current personnel: $5,568.0.

EXTENSION

Yearly breakdown is in following tables (Tables 6A - 6F).

Extension is further broken down into three components: Central Office, Regional Centers, and Agencies. Budgets for these components, with detailed explanations of each category, can be found in Tables 7 (A-E), 8 (A-E), and 9 (A-E). Technical assistance, training, purchased research, seed multiplication, mechanization research, and administrative inputs are not included in the Extension budget but may be found in separate budgets in Tables 10 and thereafter.

Inflation is included (8% annual) as a separate line item for all years after Year 1. A 10% contingency factor is included in the AID columns.

The Extension budget should be regarded as flexible, and some adjustments will surely have to be made, particularly in regard to timing. Some items can likely be reduced if certain economies are built into the project (e.g., importation of lubricants; purchasing tax free gasoline; procuring more items the first year).

A

TABLE 6A

Extension

Year 1

	A I D			GOP	
	$	¢	Total	¢	Total
Personnel - Current	-	-	-	281,238	281,238
- New	-	-	-	24,453	24,453
Furniture	29,303	30,950	60,253	-	60,253
Equipment	515,965	50,394	566,359	-	566,359
Vehicles	426,755	-	426,755	-	426,755
Fuel	-	-	-	-	-
Lubricants	-	-	-	-	-
Maintenance	-	-	-	-	-
Parts	38,095	-	38,095	-	38,095
Insurance	-	-	-	-	-
Materials	19,346	1,623	20,969	4,826	25,795
Agricultural inputs	-	-	-	-	-
Livestock inputs	-	-	-	-	-
Home Ec. inputs	-	-	-	-	-
Rent	-	27,778	27,778	-	27,778
Per Diems	-	-	-	-	-
Farm Management	-	984	984	216	1,200
Contingency	102,947	11,174	114,121	-	114,121
Inflation	-	-	-	-	-
Totals	$1,132,411	$122,903	$1,255,314	$310,733	$1,566,047

GOP counterpart excluding current personnel: $29,495.

Cost at current prices, excluding current personnel: $1,284,809.

TABLE 6B

Extension

Year 2

	AID			GOP	
	$	¢	Total	¢	Total
Personnel - Current	-	-	-	281,238	281,238
- New	-	-	-	224,143	224,143
Furniture	-	21,298	21,298	-	21,298
Equipment	-	-	-	-	-
Vehicles	240,546	-	240,546	-	240,546
Fuel	-	40,725	40,725	8,940	49,665
Lubricants	-	4,357	4,357	958	5,315
Maintenance	4,900	8,493	13,393	2,940	16,333
Parts	22,477	-	22,477	3,174	25,651
Insurance	-	17,497	17,497	3,841	21,338
Materials	39,363	3,124	42,487	13,808	56,295
Agricultural inputs	2,262	-	2,262	6,786	9,048
Livestock inputs	3,215	-	3,215	9,642	12,857
Home Ec. inputs	-	6,248	6,248	1,372	7,620
Rent	-	3,000	3,000	4,762	7,762
Per Diems	-	31,947	31,947	13,691	45,638
Farm Management	-	2,898	2,898	1,302	4,200
Contingency	31,276	13,959	45,235	-	45,235
Inflation	27,524	12,283	39,807	23,628	63,435
Totals	$371,563	$165,829	$537,392	$600,225	$1,137,617

GOP counterpart excluding current personnel: $318,987

Cost at current prices, excluding current personnel: $792,944.

TABLE 6C

Extension

Year 3

	AID			GOP	
	$	¢	Total	¢	Total
Personnel - Current	-	-	-	281,238	281,238
- New	-	-	-	390,525	390,525
Furniture	-	21,854	21,854	-	21,854
Equipment	-	-	-	-	-
Vehicles	240,546	-	240,546	-	240,546
Fuel	-	54,506	54,506	24,489	78,995
Lubricants	-	5,777	5,777	2,595	8,372
Maintenance	7,772	10,103	17,875	8,030	25,905
Parts	22,477	-	22,477	5,047	27,524
Insurance	-	23,022	23,022	10,343	33,365
Materials	60,168	4,436	64,604	22,049	86,653
Agricultural inputs	5,079	-	5,079	15,239	20,318
Livestock inputs	6,194	-	6,194	18,582	24,776
Home Ec. inputs	-	8,872	8,872	3,986	12,858
Rent	-	3,000	3,000	13,334	16,334
Per Diems	-	35,250	35,250	35,251	70,501
Farm Management	-	2,916	2,916	2,484	5,400
Contingency	34,224	16,973	51,197	-	51,197
Inflation	62,643	31,068	93,711	91,845	185,556
Totals	$439,103	$217,777	$656,880	$925,037	$1,581,917

GOP counterpart excluding current personnel: $643,799

Cost at current prices, excluding current personnel: $1,115,123.

TABLE 6D

Extension

Year 4

	A I D			GOP	
	$	¢	Total	¢	Total
Personnel - Current	-	-	-	281,238	281,238
- New	-	-	-	525,810	525,810
Furniture	-	6,588	6,588	-	6,588
Equipment	-	-	-	-	-
Vehicles	38,095	-	38,095	-	38,095
Fuel	-	58,495	58,495	49,829	108,324
Lubricants	-	6,172	6,172	5,257	11,429
Maintenance	10,643	8,514	19,157	16,319	35,476
Parts	41,143	-	41,143	6,920	48,063
Insurance	-	24,512	24,512	20,881	45,393
Materials	67,071	5,014	72,085	26,629	98,714
Agricultural inputs	8,373	-	8,373	25,120	33,493
Livestock inputs	13,291	-	13,291	39,874	53,165
Home Ec. inputs	-	10,028	10,028	8,544	18,572
Rent	-	3,000	3,000	21,905	24,905
Per Diems	-	30,271	30,271	70,631	100,902
Farm Management	-	2,700	2,700	6,300	9,000
Contingency	17,861	15,529	33,390	-	33,390
Inflation	51,026	44,365	95,391	214,007	309,398
Totals	$247,503	$215,188	$462,691	$1,319,264	$1,781,955

GOP counterpart excluding current personnel: $1,038,027.

Cost at current prices, excluding current personnel: $1,191,319.

TABLE 6E

Extension

Year 5

	AID			GOP	
	$	¢	Total	¢	Total
Personnel - Current	-	-	-	281,238	281,238
- New	-	-	-	555,905	555,905
Furniture	-	-	-	-	-
Equipment	-	-	-	-	-
Vehicles	-	-	-	-	-
Fuel	-	33,626	33,626	78,462	112,088
Lubricants	-	3,566	3,566	8,320	11,886
Maintenance	11,043	-	11,043	25,767	36,810
Parts	22,477	-	22,477	7,174	29,651
Insurance	-	14,190	14,190	33,107	47,297
Materials	67,071	3,071	70,142	29,524	99,666
Agricultural inputs	10,556	-	10,556	31,666	42,222
Livestock inputs	16,719	-	16,719	50,155	66,874
Home Ec. inputs	-	6,142	6,142	14,334	20,476
Rent	-	-	-	25,715	25,715
Per Diems	-	10,273	10,273	92,457	102,730
Farm Management	-	1,260	1,260	11,340	12,600
Contingency	12,787	7,213	20,000	-	20,000
Inflation	50,704	28,601	79,305	347,485	426,790
Totals	$191,357	$107,942	$299,299	$1,592,649	$1,891,948

GOP counterpart excluding current personnel: $1,311,411.

Cost at current prices, excluding current personnel: $1,183,920.

TABLE 6F

Extension

Recurring Costs
Once Project Ends *
(Inclation Excluded)

	Central Office	Regional Centers	Agencies	Total
Personnel - new	95,238	344,477	128,000	567,715
Furniture	-	-	-	-
Equipment	-	-	-	-
Vehicles	-	-	-	-
Fuel	8,743	51,467	51,878	112,088
Lubricants	1,029	5,200	5,657	11,886
Maintenance	3,000	16,000	17,810	36,810
Parts	2,857	15,556	17,460	35,873
Insurance	4,349	21,116	21,832	47,297
Materials	80,783	8,645	10,238	99,666
Agricultural inputs	-	4,127	40,952	45,079
Livestock inputs	-	41,318	20,476	61,794
Home Ec. inputs	-	-	20,476	20,476
Rent	-	14,286	11,429	25,715
Per Diems	15,873	67,200	19,657	102,730
Farm Management	-	-	12,600	12,600
Totals	$211,872	$589,392	$378,465	$1,179,729

* Excludes inflation factor, contingency, and current personnel.

TABLE 7A

Central Office

Year 1

	A I D			GOP	
	$	¢	Total	¢	Total
Personnel - Current 1/	-	-	-	99,333	99,333
- New 2/	-	-	-	9,524	9,524
Furniture 3/	1,960	6,178	8,138	-	8,138
Equipment 4/	65,184	1,984	67,168	-	67,168
Vehicles 5/	86,984	-	86,984	-	86,984
Fuel 6/	-	-	-	-	-
Lubricants 7/	-	-	-	-	-
Maintenance 8/	-	-	-	-	-
Parts 9/	6,857	-	6,957	-	6,857
Insurance 10/	-	-	-	-	-
Materials 11/	17,386	1,623	19,009	4,173	23,182
Agricultural inputs	-	-	-	-	-
Livestock inputs	-	-	-	-	-
Rent	-	-	-	-	-
Per Diems 12/	-	-	-	-	-
Contingency 13/	17,837	979	18,816	-	18,816
Inflation 14/	-	-	-	-	-
Totals	$196,208	$10,764	$206,972	$113,030	$320,002

GOP counterpart excluding current personnel: $13,697

TABLE 7B

Central Office

Year 2

	AID			GOP	
	$	₲	Total	₲	Total
Personnel - Current 1/	-	-	-	99,333	99,333
- New 2/	-	-	-	52,381	52,381
Furniture 3/	-	-	-		-
Equipment 4/	-	-	-	-	-
Vehicles 5/	-	-	-	-	-
Fuel 6/	-	7,169	7,169	1,574	8,743
Lubricants 7/	-	843	843	186	1,029
Maintenance 8/	900	1,560	2,460	540	3,000
Parts 9/	-	-	-	571	571
Insurance 10/	-	3,566	3,566	783	4,349
Materials 11/	35,278	-	35,278	11,760	47,038
Agricultural inputs	-	-	-	-	-
Livestock inputs	-	-	-	-	-
Rent	-	-	-	-	-
Per Diems 12/	-	6,667	6,667	2,857	9,524
Contingency 13/	3,618	1,981	5,599	-	5,599
Inflation 14/	3,184	1,743	4,927	5,652	10,579
Totals	42,980	23,529	$66,509	175,637	$242,146

GOP counterpart excluding current personnel: $76,304.

TABLE 7C

Central Office

Year 3

	AID			GOP	
	$	¢	Total	¢	Total
Personnel - Current 1/	-	-	-	99,333	99,333
- New 2/	-	-	-	85,714	85,714
Furniture 3/	-	-	-	-	-
Equipment 4/	-	-	-	-	-
Vehicles 5/	-	-	-	-	-
Fuel 6/	-	6,032	6,032	2,711	8,743
Lubricants 7/	-	710	710	319	1,029
Maintenance 8/	900	1,170	2,070	930	3,000
Parts 9/	-	-	-	571	571
Insurance 10/	-	3,001	3,001	1,348	4,349
Materials 11/	54,230	-	54,230	18,077	72,307
Agricultural inputs	-	-	-	-	-
Livestock inputs	-	-	-	-	-
Rent	-	-	-	-	-
Per Diems 12/	-	5,079	5,079	5,079	10,158
Contingency 13/	5,513	1,599	7,112	-	7,112
Inflation 14/	10,091	2,927	13,018	19,094	32,112
Totals	70,734	20,518	$91,252	233,176	$324,428

GOP counterpart excluding current personnel: $133,843.

TABLE 7D

Central Office

Year 4

	AID			GOP	
	$	¢	Total	¢	Total
Personnel - Current 1/	-	-	-	99,333	99,333
- New 2/	-	-	-	95,238	95,238
Furniture 3/	-	-	-	-	-
Equipment 4/	-	-	-	-	-
Vehicles 5/	-	-	-	-	-
Fuel 6/	-	4,721	4,721	4,022	8,743
Lubricants 7/	-	556	556	473	1,029
Maintenance 8/	900	720	1,620	1,380	3,000
Parts 9/	6,857	-	6,857	571	7,428
Insurance 10/	-	2,349	2,349	2,000	4,349
Materials 11/	60,587	-	60,587	20,196	80,783
Agricultural inputs	-	-	-	-	-
Livestock inputs	-	-	-	-	-
Rent	-	-	-	-	-
Per Diems 12/	-	4,762	4,762	11,111	15,873
Contingency 13/	6,834	1,311	8,145	-	8,145
Inflation 14/	19,524	3,745	23,269	35,058	58,327
Totals	94,702	18,164	$112,866	269,382	$382,248

GOP counterpart excluding current personnel: $170,050.

TABLE 7E

Central Office

Year 5

	AID			GOP	
	$	¢	Total	¢	Total
Personnel - Current 1/	-	-	-	99,333	99,333
- New 2/	-	-	-	95,238	95,238
Furniture 3/	-	-	-	-	-
Equipment 4/	-	-	-	-	-
Vehicles 5/	-	-	-	-	-
Fuel 6/	-	2,623	2,623	6,120	8,743
Lubricants 7/	-	309	309	720	1,029
Maintenance 8/	900	-	900	2,100	3,000
Parts 9/	-	-	-	571	571
Insurance 10/	-	1,305	1,305	3,044	4,349
Materials 11/	60,587	-	60,587	20,196	80,783
Agricultural inputs	-	-	-	-	-
Livestock inputs	-	-	-	-	-
Rent	-	-	-	-	-
Per Diems 12/	-	1,587	1,587	14,286	15,873
Contingency 13/	6,149	582	6,731	-	6,731
Inflation 14/	24,382	2,309	26,691	51,289	77,980
Totals	92,018	8,715	$100,733	292,897	$393,630

GOP counterpart excluding current personnel: $193,564.

1/ Current Personnel: 48 positions in Central Office. All will be involved to some degree or other in project. Salary is actual.

2/ New Personnel: Year 1: 2 new employees in Training Section, at ₡50,000/month. Year 2: Above plus 9 new employees (6 in Communications Section, 2 in Program and Evaluation Section, and 1 Livestock Specialist), at average cost of ₡50,000/month. Year 3: Above, plus 7 new employees, at same average cost. Year 4: Above, plus 2 new employees.

3/ Furniture:

12 desks	at	₡ 25,000	₡300,000	$ 2,381
12 desk chairs	at	16,000	192,000	1,524
12 chairs	at	4,500	54,000	429
12 bookcases	at	15,000	180,000	1,429
7 cabinets	at	25,000	175,000	1,389 *
2 File cabinets	at	36,000	72,000	571 *
4 typing tables	at	5,600	22,400	178
1 meeting table			10,000	79
2 blackboards	at	10,000	20,000	159

* Foreign procurement; all others local.

4/ Equipment:

3 manual typewriters	at	₡ 98,000	₡294,000	$ 2,333
2 electric typewriters	at	297,000	594,000	4,714
1 radio transmitter			150,000	1,190
1 typesetter			350,000	2,778
5 air conditioners	at	50,000	250,000	1,984
5 calculators	at	22,000	110,000	873
4 cameras	at	90,000	360,000	2,857
2 professional cameras	at	130,000	260,000	2,063
1 movie camera - 16 mm			189,000	1,500
1 movie camera - 8 mm			214,000	1,698

1 tripod		₡ 20,000	$ 158
1 offset machine with accessories		3,150,000	25,000
1 electric cutter		230,000	1,825
1 stencil machine		200,000	1,587
2 tape recorders	at ₡50,000	100,000	794
2 ampli-rox	at 189,000	378,000	3,000
5 megaphones	at 13,000	65,000	516
1 recording studio		250,000	1,984 *
1 xerograph		15,000	119
1 8 mm projector		126,000	1,000
1 16 mm projector		100,000	794
3 slide projectors	at 37,000	111,000	881
3 screens	at 15,000	45,000	357
1 overhead projector		50,000	397
2 extension cables	at 3,000	6,000	48
1 refrigerator (for films, vaccines, etc.)		126,000	1,000
lamps and accessories for projectors		50,000	397
veterinary instruments		250,000	1,984
scales for weighing grains		10,000	79
1 food blender		10,000	79
1 sewing machine		30,000	238
1 stove		30,000	238
1 mixer		20,000	159
3 measuring tapes	at 15,000	45,000	357
beekeeping equipment		200,000	1,587
4 rolls of solar film	at 18,900	75,600	600
		₡8,463,600	$67,168

* Local procurement. All other items are foreign procurement.

5/ Vehicles:

3 sedans	at ₡820,000	₡2,460,000	$19,524
5 diesel pickups	at 1,200,000	6,000,000	47,619
1 equipped movil unit van		2,500,000	19,841

6/ Fuel:

300 liters per month per unit, starting Year 2.

Price:

₡50 per liter for sedans and ₡26 per liter for other vehicles.

Financing shared:

First year (Year 2 of project):	AID 82%,	GOP 18%
Second year (" 3 " "):	AID 69%,	GOP 31%
Third year (" 4 " "):	AID 54%,	GOP 46%
Fourth year (" 5 " "):	AID 30%,	GOP 70%

7/ Lubricants:

8 liters per month per vehicle. Cost (considering purchases via drums) at ₡150 per liter. Same sharing formula for financing as above.

8/ Maintenance (filters, nuts, bolts, etc.):

₡3,500 per month per vehicle. Same funding formula as above. 30% of total is dollar procurement.

9/ Parts (tires, batteries, major repair items):

Calculated at ₡40,000 per vehicle per year, of which 60% is imported parts, financed by AID, and the remainder is local currency financed by the GOP.

In Years 1 and 4, sufficient imported parts are ordered for 3 years.

10/ Insurance:

Calculated at 5% of value of vehicle. Financed under same formula as above.

11/ Materials:

Year 1:

1000 reams of paper	at ₡	900	₡ 900,000	$ 7,143
40 boxes of stencils	"	6,000	240,000	1,905
20 boxes corrector	at	400	8,000	63
3 heavy duty staplers	at	5,000	15,000	119
100 boxes of staplers	at	200	20,000	159
binding materials			31,250	248
2900 cardboard sheets	at	45	130,500	1,036
pens			5,000	40
ink			18,000	143
brushes			30,000	238
art brushes			6,000	47
art paper			4,000	32
graph paper			4,000	32
rapidograph			8,000	63
photographic materials			599,525	4,758
recording materials			12,000	95
office materials			500,000	3,968
offset materials			252,000	2,000
mimeograph ink			137,700	1,093
			2,921,101	23,182

75% is expected to be $ procurement; 25% ₡ procurement.
AID will finance 82%; GOP 18%.

Year 2:

paper	₡3,829,500	$30,393
ink	200,970	1,595
stencil	104,940	833
corrector	13,200	105
staples	33,000	262
binding materials	17,325	137
cardboard	213,150	1,692
pens	4,125	33

ink	¢ 14,850	$ 118
brushes	6,000	48
art paper	4,000	31
graph paper	4,000	31
stencil materials	8,000	63
rapidograph	8,000	63
offset materials	378,000	3,000
photograph and sound materials	537,900	4,269
office materials	550,000	4,365
	5,926,960	47,038

For Years 2 - 5 AID will finance 75%, all $ costs;
GOP will finance 25%, all ¢ costs.

Year 3:

paper	¢6,258,420	$49,670
other printing and communications	912,104	7,239
offset	504,000	4,000
photographic and sound	831,145	6,596
office materials	605,000	4,802
	9,110,669	72,307

Year 4 and thereafter:

paper	¢7,000,000	$55,556
other printing and communications	1,019,688	8,093
offset	693,000	5,500
photographic and sound	800,319	6,352
office materials	665,500	5,282
	10,178,507	80,783

Agricultural inputs, Livestock inputs, and Rent are zero for the Central Office.

12/ Per Diems:

Year 2: 1,500 days. Year 3: 1,600 days. Years 4 and 5: 2,500 days each. Calculated at ₱800 per day.

Financed according to following formula:

First year	(Year 2 of project):	AID 70%;	GOP 30%
Second year	(" 3 " "):	AID 50%;	GOP 50%
Third year	(" 4 " "):	AID 30%;	GOP 70%
Fourth year	(" 5 " "):	AID 10%;	GOP 90%

13/ Contingency:

10% additional of AID columns.

14/ Inflation:

8% annual factor compunded (i.e., 1.08 factor for Year 2, 1.17 factor for Year 3, 1.26 factor for Year 4, 1.36 factor for Year 5). Excludes current personnel in GOP columns.

TABLE 8A

Regional Centers

Year 1

	AID			GOP	
	$	¢	Total	¢	Total
Personnel - Current	-	-	-	-	-
- New 1/	-	-	-	14,929	14,929
Furniture 2/	19,726	15,174	34,900	-	34,900
Equipment 3/	265,792	29,533	295,325	-	295,325
Vehicles 4/	180,990	-	180,990	-	180,990
Fuel 5/	-	-	-	-	-
Lubricants 6/	-	-	-	-	-
Maintenance 7/	-	-	-	-	-
Parts 8/	16,000	-	16,000	-	16,000
Insurance 9/	-	-	-	-	-
Materials 10/	1,960	-	1,960	653	2,613
Agricultural inputs 11/	-	-	-	-	-
Livestock inputs 12/	-	-	-	-	-
Rent 13/	-	27,778	27,778	-	27,778
Per Diems 14/	-	-	-	-	-
Contingency 15/	48,447	7,249	55,696	-	55,696
Inflation 16/	-	-	-	-	-
Totals	532,915	79,734	$612,649	15,582	$628,231

TABLE 8B

Regional Centers

Year 2

	AID			GOP	
	$	¢	Total	¢	Total
Personnel - Current	-	-	-	-	-
- New 1/	-	-	-	156,143	156,143
Furniture 2/	-	10,116	10,116	-	10,116
Equipment 3/	-	-	-	-	-
Vehicles 4/	120,660	-	120,660	-	120,660
Fuel 5/	-	18,087	18,087	3,970	22,057
Lubricants 6/	-	1,827	1,827	402	2,229
Maintenance 7/	2,057	3,566	5,623	1,234	6,857
Parts 8/	10,667	-	10,667	1,333	12,000
Insurance 9/	-	7,421	7,421	1,629	9,050
Materials 10/	4,085	-	4,085	1,362	5,447
Agricultural inputs 11/	357	-	357	1,072	1,429
Livestock inputs 12/	1,945	-	1,945	5,833	7,778
Rent 13/	-	3,000	3,000	4,762	7,762
Per Diems 14/	-	20,160	20,160	8,640	28,800
Contengency 15/	13,977	6,418	20,395	-	20,395
Inflation 16/	12,300	5,647	17,947	14,910	32,857
Totals	166,048	76,242	$242,290	201,290	$443,580

TABLE 8C

Regional Centers

Year 3

	AID			GOP	
	$	₡	Total	₡	Total
Personnel - Current	-	-	-	-	-
- New 1/	-	-	-	255,287	255,287
Furniture 2/	-	10,116	10,116	-	10,116
Equipment 3/	-	-	-	-	-
Vehicles 4/	120,660	-	120,660	-	120,660
Fuel 5/	-	25,366	25,366	11,396	36,762
Lubricants 6/	-	2,563	2,563	1,151	3,714
Maintenance 7/	3,429	4,457	7,886	3,543	11,429
Parts 8/	10,667	-	10,667	2,222	12,889
Insurance 9/	-	10,407	10,407	4,676	15,083
Materials 10/	5,938	-	5,938	1,979	7,917
Agricultural inputs 11/	595	-	595	1,786	2,381
Livestock inputs 12/	4,051	-	4,051	12,154	16,205
Rent 13/	-	3,000	3,000	9,524	12,524
Per Diems 14/	-	24,000	24,000	24,000	48,000
Contingency 15/	14,534	7,991	22,525	-	22,525
Inflation 16/	26,603	14,627	41,230	54,532	95,762
Totals	186,477	102,527	$289,004	382,250	$671,254

TABLE 8D

Regional Centers

Year 4

	AID			GOP	
	$	₡	Total	₡	Total
Personnel - Current	-	-	-	-	-
- New 1/	-	-	-	344,477	344,477
Furniture 2/	-	-	-	-	-
Equipment 3/	-	-	-	-	-
Vehicles 4/	-	-	-	-	-
Fuel 5/	-	27,792	27,792	23,675	51,467
Lubricants 6/	-	2,808	2,808	2,392	5,200
Maintenance 7/	4,800	3,840	8,640	7,360	16,000
Parts 8/	16,000	-	16,000	3,111	19,111
Insurance 9/	-	11,402	11,402	9,714	21,116
Materials 10/	6,484	-	6,484	2,161	8,645
Agricultural inputs 11/	952	-	952	2,858	3,810
Livestock inputs 12/	7,656	-	7,656	22,969	30,625
Rent 13/	-	3,000	3,000	14,286	17,286
Per Diems 14/	-	20,160	20,160	47,040	67,200
Contingency 15/	3,589	6,900	10,489	-	10,489
Inflation 16/	10,253	19,713	29,966	124,673	154,639
Totals	49,734	95,615	$145,349	604,716	$750,065

TABLE 8E

Regional Centers

Year 5

	AID			GOP	
	$	₡	Total	₡	Total
Personnel - Current	-	-	-	-	-
- New 1/	-	-	-	344,477	344,477
Furniture 2/	-	-	-	-	-
Equipment 3/	-	-	-	-	-
Vehicles 4/	-	-	-	-	-
Fuel 5/	-	15,440	15,440	36,027	51,467
Lubricants 6/	-	1,560	1,560	3,640	5,200
Maintenance 7/	4,800	-	4,800	11,200	16,000
Parts 8/	10,667	-	10,667	3,111	13,778
Insurance 9/	-	6,335	6,335	14,781	21,116
Materials 10/	6,484	-	6,484	2,161	8,645
Agricultural inputs 11/	1,032	-	1,032	3,095	4,127
Livestock inputs 12/	10,330	-	10,330	30,988	41,318
Rent 13/	-	-	-	14,286	14,286
Per Diems 14/	-	6,720	6,720	60,480	67,200
Contingency 15/	3,331	3,006	6,337	-	6,337
Inflation 16/	13,210	11,918	25,128	188,985	214,113
Totals	49,854	44,979	94,833	713,231	808,064

NOTE: Three regional centers will begin full functioning in Year 2; 4 employees of each will begin 3 months earlier. Two centers will begin to function a year later, and two more the following year.

1/ Personnel

All regional center personnel will be considered new, since they will be filling new positions. Some may be persons already employed by SEAG, in which case other persons will have to be employed to fill their previous positions.

Each regional center will have 13 to 14 persons when fully staffed:

	Monthly Salary
1 Regional Chief	₲ 63,000
2 Agricultural Specialists	53,000
1 Livestock Specialists (1 first year, 1 second year)	53,000
1 Communications Technician	40,000
1 Agricultural Economist	53,000
1 Nutrition/Home Improvement Specialist	36,000
1 Program Planner/Evaluator	53,000
1 Administrator	46,000
1 Secretary/Reproduction Machine Operator	36,000
1 Mechanic	36,000
1 Mechanic's Assistant (second year)	25,000
1 Beekeeping Expert (in three centers only)	53,000

2/ Furniture

Each new center will contain the following furniture. A.I.D. will finance 100%.

	Guarani	Dollar
11 Desks at ₲25,000	275,000	2,183
11 Metal Cabinets at ₲25,000	275,000	2,183
4 Typing Tables at ₲5,600	22,400	178

	Guarani	Dollar
11 Desk Chairs at ₲ 4,500	49,500	393
30 Chairs at ₲1,800	54,000	429
6 Bookcases at ₲15,000	90,000	714
1 Blackboard	10,000	79
1 Conference Table	12,000	95
4 File Cabinets at ₲20,000 *	80,000	635
1 Work Cabinet	5,600	44
1 Map Container	40,000	317
2 Work Tables at ₲12,000	24,000	190
1 Drawing Table	25,000	198
Storage Shelves	30,000	238

* Foreign procurement; all other local

Foreign procurement items for all centers will be ordered in Year 1. All other items will be purchased in the year before a center is to open.

3/ Equipment:

Each center will receive the following:

	Guarani	Dollar
3 Typewriters with medium carriage at ₲98,500	295,500	2,345
1 Typewriter with wide carriage	110,000	873
4 Calculators at ₲22,000	88,000	698
1 Set Cooking Utensils	50,000	397
Radio Transmitter	100,000	794
1 Set Carpentry Tools	50,000	397
Cooking Laboratory	63,000	500
Refrigerator	45,000	357
2 Ice Chests at ₲10,000	20,000	159
1 Level for Surveying	60,000	476
16 Survey Poles at ₲2,000	32,000	254
8 Soil Sample Extractors at ₲1,000	8,000	63
Microscope and Accessories	100,000	794
8 Measuring Tapes and Telemeter at ₲10,000	80,000	635
Refrigerator for Vaccines	80,000	635
8 Back Sprayers at ₲18,000	144,000	1,143
4 Sprayers at ₲30,000	120,000	952

	Guarani	Dollar
1 Set of Sprayer Nozzles	3,000	24
2 Lifting Devices ("Aguilones") at ₲2,000	4,000	32
Agricultural Implements (Animal Powered)	630,000	5,000
3 Sets Fruit Injection Equipment at ₲9,000	27,000	214
3 Sets of Pruning Equipment at ₲9,000	27,000	214
8 Sets of Implements (hoe, machete, shovel) at ₲6,000	48,000	381
1 Portable Generator	80,000	635
Automobile Maintenance Equipment	300,000	2,381
3 Air Conditioners at ₲50,000	150,000	1,190
1 Roll Solarfilm	18,900	150
Telephone	100,000	794
2 Veterinary Cases at ₲5,000	10,000	79
Mimeograph	200,000	1,587
Cutter	100,000	794
Drawing Equipment	70,000	556
4 Cameras at ₲90,000	360,000	2,857
3 Recorders at ₲50,000	150,000	1,190
2 Portable Amplifiers at ₲189,000	378,000	3,000
3 Megaphones at ₲13,000	39,000	310
3 16mm Projectors at ₲100,000	300,000	2,381
3 8mm Projectors at ₲126,000	378,000	3,000
2 Slide Projectors at ₲50,000	100,000	794
6 Portable Screens at ₲15,000	90,000	714
Lamps for Above (replacements)	50,000	397
1 Overhead Projector	50,000	397
Set of Maps	12,600	100

In addition, 3 centers will receive the following beekeeping equipment:

18 Hives with Accessories at ₲4,000	72,000	571
12 Projecting Screens at ₲300	3,600	29
6 Beekeeper's Overalls at ₲1,500	9,000	71
12 Copper Smokers at ₲1,700	20,400	162
12 Crowbars at ₲300	3,600	29
Wax Device ("topadora de cera a rodillas")	80,000	635
18 Gratings at ₲500	9,000	71

	Guarani	Dollar
1 Sedification Device	20,000	159
1 Centrifugal Extractor	20,000	159
2 Centrifugal Extractors at ₲19,000	38,000	302
1 Circular Saw	80,000	635
1 Centrifuge	90,000	714
1 Hydrograph	9,000	71

It is estimated that 10% of the equipment will be local procurement. All equipment will be ordered in Year 1 of the Project.

4/ Vehicles

Each center will acquire:

6 Diesel Pickups at ₲1,200,000	7,200,000	57,143
2 Motorcycles (125cc) at ₲100,800	201,600	1,600
1 Trailer (to be attached to a pickup)	200,000	1,587
		60,330

The vehicles will be acquired the year before a center opens.

5/ Fuel

Each center is expected to use per month:

400 litres of diesel fuel (at ₲26) per month for each of 5 pickups.
200 litres of diesel fuel (at ₲26) for the sixth pickup.
200 litres of gasoline (at ₲50) per motorcycle.

Financing is shared as follows:

First year (Year 2 of Project): A.I.D. 82%, GOP 18%
Second year (Year 3 of Project): A.I.D. 69%, GOP 31%
Third year (Year 4 of Project): A.I.D. 54%, GOP 46%
Fourth year (Year 5 of Project): A.I.D. 30%, GOP 70%

6/ Lubricants:

8 Litres per pickup per month at ₲150 (purchased in bulk)
2 Litres per motorcycle per month at ₲150
Same sharing factor as above.

7/ Maintenance:

₲3,500 per month per pickup; ₲1,500 per month per motorcycle. Same sharing factor as above. Thirty percent of total is dollar procurement.

8/ Parts:

Calculated at ₲40,000 per year per pickup and ₲20,000 per year motorcycle, of which 80% is imported parts financed by A.I.D. and the remainder is local currency financed by the GOP. When the vehicle is ordered, sufficient imported parts for three years are ordered. For vehicles ordered in Years 1 and 2, a three-year stock of imported parts is reordered in Years 4 and 5, respectively.

9/ Insurance:

Fifty-seven percent (57%) of value of vehicles. Financing using same sharing factor formula as in 5/ above.

10/ Materials:

Virtually all materials were included under the Central Office. In addition, each center will require the following during its first year of operation (to be ordered the year before):

	Guarani	Dollar
50 Reams of mimeograph paper at ₲900	45,000	357
80 Cardboard Sheets at ₲45	3,600	29
48 Rolls of Slide Film at ₲500	24,000	190
96 Rolls of Black & White Film at ₲200	19,200	152
90 Casettes at ₲200	18,000	143
	109,800	871

A.I.D. will finance 75%, expected to be dollar procurement. The GOP will finance 25%, expected to be local procurement.

During each subsequent year of operation for a center, the following materials will be required:

	Guarani	Dollar
100 Reams of Mimeograph paper at ₲900	90,000	714
100 Cardboard Sheets at ₲45	4,500	36
96 Rolls of Black & White Film at ₲200	19,200	152
48 Rolls of Slide Film at ₲500	24,000	190
90 Casettes at ₲200	18,000	143
	155,700	1,235

11/ Agricultural inputs

For each year the following number of applied research trials will be carried out by the regional centers (numbers are for the whole country). Cost is ₲20,000 each. Year 2:9; Year 3:15; Year 4:24; Year 5:26.

A.I.D. will finance 25% of the costs, expected to be for dollar procurement; and the GOP will finance 75%, expected to be for local currency costs.

12/ Livestock inputs

For each year the following value of applied research livestock trials will be carried out by the regional centers (numbers are for whole country). Costs are for such items as feed, vaccines, and semen.

Year 2 :	980,000	7,778
Year 3 :	2,042,000	16,205
Year 4 :	3,859,000	30,625
Year 5 :	5,206,000	41,318

A.I.D. will finance 25%, expected to be dollar procurement; the GOP will finance 75%, expected to be local currency procurement.

13/ Rent:

A.I.D. funds will finance the construction of a regional center at the IAN experimental station in Caacupé, at a cost of ₲3,500,000 ($27,778).

For the other 6 centers, the GOP is expected to pay an average of ₲25,000 per month as rent or mortgage payments. A.I.D. will allocate $1,500 in each center's first year of operation for renovations.

14/ Per Diem:

Each center is expected to have an average of 1,512 days of per diem a year, at an average cost of ₲800. Financing will be by the following formula:

First year	(Year 2 of Project)	: A.I.D. 70%, GOP 30%
Second year	(Year 3 of Project)	: A.I.D. 50%, GOP 50%
Third year	(Year 4 of Project)	: A.I.D. 30%, GOP 70%
Fourth year	(Year 5 of Project)	: A.I.D. 10%, GOP 90%

15/ Contingency

Ten percent additional of A.I.D. columns.

16/ Inflation

Eight percent annual factor, compounded.

TABLE 9A
AGENCIES

Year 1

	A.I.D. $	A.I.D. ¢	A.I.D. Total	GOP ¢	GOP Total
Personnel - current	-	-	-	181,905	181,905
new 1/	-	-	-	-	-
Furniture 2/	7,617	9,598	17,215	-	17,215
Equipment 3/	184,989	18,877	203,866	-	203,866
Vehicles 4/	158,781	-	158,781	-	158,781
Fuel 5/	-	-	-	-	-
Lubricants 6/	-	-	-	-	-
Maintenance 7/	-	-	-	-	-
Parts 8/	15,238	-	15,238	-	15,238
Insurance 9/	-	-	-	-	-
Materials 10/	-	-	-	-	-
Agricultural Inputs 11/	-	-	-	-	-
Livestock Inputs 12/	-	-	-	-	-
Home Econ. Inputs 13/	-	-	-	-	-
Rent 14/	-	-	-	-	-
Per Diem 15/	-	-	-	-	-
Farm Management 16/	-	984	984	216	1,200
Contingency 17/	36,663	2,946	39,609	-	39,609
Inflation 18/	-	-	-	-	-
Totals	$ 403,288	$ 32,405	$ 435,693	$ 182,121	$ 617,814

GOP counterpart excluding current personnel: $216

TABLE 9B
AGENCIES

Year 2

	A.I.D. $	A.I.D. ₡	A.I.D. Total	GOP ₡	GOP Total
Personnel - Current	-	-	-	181,905	181,905
- New 1/	-	-	-	15,619	15,619
Furniture 2/	-	11,182	11,182	-	11,182
Equipment 3/	-	-	-	-	-
Vehicles 4/	119,886	-	119,886	-	119,886
Fuel 5/	-	15,469	15,469	3,396	18,865
Lubricants 6/	-	1,687	1,687	370	2,057
Maintenance 7/	1,943	3,367	5,310	1,166	6,476
Parts 8/	11,810	-	11,810	1,270	13,080
Insurance 9/	-	6,510	6,510	1,429	7,939
Materials 10/	-	3,124	3,124	686	3,810
Agricultural Inputs 11/	1,905	-	1,905	5,714	7,619
Livestock Inputs 12/	1,270	-	1,270	3,809	5,079
Home Econ. Inputs 13/	-	6,248	6,248	1,372	7,620
Rent 14/	-	-	-	-	-
Per Diem 15/	-	5,120	5,120	2,194	7,314
Farm Management 16/	-	2,898	2,898	1,302	4,200
Contingency 17/	13,681	5,560	19,241	-	19,241
Inflation 18/	12,040	4,893	16,933	3,066	19,999
Totals	$ 162,535	$ 66,058	$ 228,593	$ 223,298	$ 451,891

GOP counterpart, excluding current personnel: $41,393

TABLE 9C

AGENCIES

YEAR 3

	A.I.D.			GOP	
	$	¢	Total	¢	Total
Personnel - current	-	-	-	181,905	181,905
Personnel - new 1/	-	-	-	49,524	49,524
Furniture 2/	-	11,738	11,738	-	11,738
Equipment 3/	-	-	-	-	-
Vehicles 4/	119,886	-	119,886	-	119,886
Fuel 5/	-	23,108	23,108	10,382	33,490
Lubricants 6/	-	2,504	2,504	1,125	3,629
Maintenance 7/	3,443	4,476	7,919	3,557	11,476
Parts 8/	11,810	-	11,810	2,254	14,064
Insurance 9/	-	9,614	9,614	4,319	13,933
Materials 10/	-	4,436	4,436	1,993	6,429
Agricultural inputs 11/	4,484	-	4,484	13,453	17,937
Livestock inputs 12/	2,143	-	2,143	6,428	8,571
Home Ec. inputs 13/	-	8,872	8,872	3,986	12,858
Rent 14/	-	-	-	3,810	3,810
Per Diem 15/	-	6,171	6,171	6,172	12,343
Farm Management 16/	-	2,916	2,916	2,484	5,400
Contingency 17/	14,177	7,383	21,560	-	21,560
Inflation 18/	25,949	13,514	39,463	18,219	57,682
Totals	$181,892	$94,732	$276,624	$309,611	$586,235

GOP counterpart excluding current personnel: $127,706.

TABLE 9D

AGENCIES

YEAR 4

	A.I.D.			GOP	
	$	¢	Total	¢	Total
Personnel - current	-	-	-	181,905	181,905
Personnel - new 1/	-	-	-	86,095	86,095
Furniture 2/	-	6,588	6,588	-	6,588
Equipment 3/	-	-	-	-	-
Vehicles 4/	38,095	-	38,095	-	38,095
Fuel 5/	-	25,982	25,982	22,132	48,114
Lubricants 6/	-	2,808	2,808	2,392	5,200
Maintenance 7/	4,943	3,954	8,897	7,579	16,476
Parts 8/	18,286	-	18,286	3,238	21,524
Insurance 9/	-	10,761	10,761	9,167	19,928
Materials 10/	-	5,014	5,014	4,272	9,286
Agricultural inputs 11/	7,421	-	7,421	22,262	29,683
Livestock inputs 12/	5,635	-	5,635	16,905	22,540
Home Ec. inputs 13/	-	10,028	10,028	8,544	18,572
Rent 14/	-	-	-,	7,619	7,619
Per Diem 15/	-	5,349	5,349	12,480	17,829
Farm Management 16/	-	2,700	2,700	6,300	9,000
Contingency 17/	7,438	7,318	14,756	-	14,756
Inflation 18/	21,249	20,907	42,156	54,276	96,432
Totals	$103,067	$101,409	$204,476	$445,166	$649,642

GOP counterpart excluding current personnel: $263,261.

TABLE 9E

AGENCIES

YEAR 5

	A.I.D.			GOP	
	$	¢	Total	¢	Total
Personnel - current	-	-	-	181,905	181,905
Personnel - new 1/	-	-	-	116,190	116,190
Furniture 2/	-	-	-	-	-
Equipment 3/	-	-	-	-	-
Vehicles 4/	-	-	-	-	-
Fuel 5/	-	15,563	15,563	36,315	51,878
Lubricants 6/	-	1,697	1,697	3,960	5,657
Maintenance 7/	5,343	-	5,343	12,467	17,810
Parts 8/	11,810	-	11,810	3,492	15,302
Insurance 9/	-	6,550	6,550	15,282	21,832
Materials 10/	-	3,071	3,071	7,167	10,238
Agricultural inputs 11/	9,524	-	9,524	28,571	38,095
Livestock inputs 12/	6,389	-	6,389	19,167	25,556
Home Ec. inputs 13/	-	6,142	6,142	14,334	20,476
Rent 14/	-	-	-	11,429	11,429
Per Diem 15/	-	1,966	1,966	17,691	19,657
Farm Management 16/	-	1,260	1,260	11,340	12,600
Contingencies 17/	3,307	3,625	6,932	-	6,932
Inflation 18/	13,112	14,374	27,486	107,211	134,697
Totals	$49,485	$54,248	$103,733	$586,521	$690,254

GOP counterpart excluding current personnel: $404,616.

NOTE: SEAG currently has 31 agencies in the project area which will be incorporated into the project as follows: Year 2: 16, Year 3: 7, Year 4: 8; 12 new agencies will be created: 4 in Year 3, 4 in Year 4, and 4 in Year 5.

1/ Personnel:

The 31 existing agencies currently have 59 technical employees, 43 earning ₡34,000 per month and 16 earning ₡28,000 per month. They will be incorporated into the project as "Current Personnel".

As to new personnel, both existing agencies (many of which have only one employee) and new agencies will be staffed to a point where they can operate effectively under the project. Most agencies will have three employees, with a few having two and several having more, with seven as the maximum. In all, 42 new employees will be added, as follows:

Second half Year 2:	10	(8 at ₡34,000 and 2 at ₡28,000)
Second half Year 3:	12	(8 at ₡34,000 and 4 at ₡28,000)
Second half Year 4:	12	(8 at ₡34,000 and 4 at ₡28,000)
Second half Year 5:	8	(4 at ₡34,000 and 4 at ₡28,000)

2/
Furniture

Each new agency will receive:

3 desks at ¢ 25,000	¢ 75,000	$ 595
3 desk chairs at ¢ 4,500	13,500	107
20 chairs at ¢ 1,800	36,000	286
1 typing table	5,600	44
2 bookcases at ¢ 15,000	30,000	238
3 file cabinets at ¢ 20,000 *	60,000	476
1 work table	12,000	95
1 blackboard and screen	10,000	79
1 work cabinet	5,600	44
storage shelves	20,000	159
	¢ 267,700	$ 2,123

Each existing agency will receive:

storage shelves	¢ 20,000	$ 159
whatever else missing	50,000	397
	¢ 70,000	$ 556

Plus, each existing agency will receive a desk (¢ 25,000), desk chair (¢ 4,500), and file cabinet (¢ 20,000*) for each new employee taken on (about 12).

* Foreign procurement. All other is expected to be local procurement. All foreign procurement items ordered in Year 1. All other items in year before office is to open, or be incorporated into Project.

3/
Equipment:

Each agency will receive the following:

1 manual soil extractor	¢ 1,000	8
tape and other measuring instruments	10,000	79
cooking utensils and equipment	50,400	400
carpintery equipment	31,500	250
horticulture equipment	31,500	250
sprayer with accessories	36,000	286

back sprayer with accessories 2 at ¢ 18,000	¢ 36,000	$ 286
3 sets of chemical containers at ¢ 3,000	9,000	71
megaphone	13,000	103
2 lifting devices ("aguilones") at ¢ 2,000	4,000	32
instruments for fruit injection	9,000	71
pruning equipment	9,000	71
camera with accessories	90,000	714
radio	150,000	1,190
recorder	50,000	397
syringes	3,000	24
instrument for cattle ("mocheta")	1,000	8
veterinary thermometer	1,000	8
metal sterilizor	3,000	24
10 tubes for fecal samples	250	2
50 vaccination needles	2,000	16
operating equipment ("mango y hojas visturí")	1,400	11
special pliers, scissors, etc.	4,400	35
cattle syringes and accessories	1,800	14
veterinary case	5,000	40
	¢ 553,250	$ 4,390

All equipment will be ordered in Year 1. 10% is expected to be local procurement.

In addition, each new agency will acquire:

1 typewriter with medium carraige	¢ 98,500	$ 782
1 level for surveying	60,000	476
	¢ 158,500	$ 1,258

(both foreign procurement)

4/ Vehicles

Each agency will acquire one diesel pickup at ¢ 1,200,000 ($9,524), plus one agency will acquire two (i.e., total of 44). 22 of the agencies (those participating in the farm management

program or with other specific needs) will also acquire one 125 cc motorcycle at ₡100,800 ($800). All vehicles will be acquired the year before an agency is created or incorporated into the project.

5/ Fuel:

Each pickup is expected to use 380 liters of diesel fuel (at ₡26) per month. Each motorcycle is expected to use 100 liters of gasoline (at ₡50) per month. Financing will be showed as follows:

First year	(Year 2 of project):	AID 82%, GOP 18%
Second year	(Year 3 of project):	AID 69%, GOP 31%
Third year	(Year 4 of project):	AID 54%, GOP 46%
Fourth year	(Year 5 of project):	AID 30%, GOP 70%

6/ Lubricants:

8 liters per pickup per month at ₡150 (purchased in bulk)
2 liters per motorcycle per month at ₡150. Same sharing factor as above.

7/ Maintenance:

₡3,500 per month per pickup; ₡1,500 per month per motorcycle. 30% of total is dollar procurement. Same sharing factor as above.

8/ Parts:

Calculated at ₡40,000 per year per pickup and ₡20,000 per year per motorcycle, of which 80% is imported parts financed by AID and the remainder is local currency financed by the GOP. When the vehicle is ordered, sufficient imported parts for three years are ordered. For vehicles ordered in Years 1 and 2, a three years' stock of imported parts is reordered in Years 4 and 5 respectively.

9/ Insurance:

5% of value of vehicle. Financing shared using same formula as in 5/ above.

10/ Materials:

Each agency is expected to spend about ¢2,500 per month on small office items (typewriter ribbons, tape, etc.). All other items were included under Central Office or Regional Centers. All of these small items are expected to be local purchase. Financing will be shared using same formula as in 5/ above.

11/ Agricultural Inputs:

Each agency is expected to have 3 demonstration plots its first year of participation in the project, 5 the second year, and 6 each succeeding year. The cost is estimated at ¢20,000 per plot in inputs. AID will finance 25%, expected to be foreign procurement; the GOP will finance 75%, expected to be local costs.

12/ Livestock Inputs:

Each agency is expected to have 2 demonstration projects each of its first and second years of participation in the project and 3 each year thereafter. The cost is extimated at ¢20,000 per demonstration in inputs. AID will finance 25%, expected to be foreign procurement; the GOP will finance 75%, expected to be local costs.

13/ Home Ec. Inputs:

Each agency will require an estimated ¢5,000 per month in inputs for nutrition courses and for carpintery, handicraft, and other vocational courses. All costs are expected to be local currency. Financing will be shared using the formula in 5/ above.

14/ Rent:

Each new agency will pay an estimated ₱10,000 per month. The GOP will finance this entirely.

15/ Per Diem:

Agents do not normally receive per diem for work in their districts. 6 days per month at ₱500 will be allocated to each agency to permit observation trips and attendance at meetings in other districts, and visits to the regional centers. Financing is shared as follows:

First year	(Year 2 of Project):	AID 70%, GOP 30%
Second year	(Year 3 of Project):	AID 50%, GOP 50%
Third year	(Year 4 of Project):	AID 30%, GOP 70%
Fourth year	(Year 5 of Project):	AID 10%, GOP 90%

16/ Farm Management:

Paratechnicians will receive equivalent of $25 per month, according to Hatch/Lanao report. Costs will be as follows:

Year 1	4	paratechnicians -	$ 1,200; AID - 82%, GOP - 18%
Year 2	14	" -	4,200; AID - 69%, GOP - 31%
Year 3	18	" -	5,400; AID - 54%, GOP - 46%
Year 4	30	" -	9,000; AID - 30%, GOP - 70%
Year 5	42	" -	12,600; AID - 10%, GOP - 90%

17/ Contingency:

10% additional of AID columns.

18/ Inflation:
8% annual factor, compounded. Excludes current personnel in GOP columns.

TABLE 10

TRAINING

[illegible] YEARS
([illegible]00)

	AID		
	$	¢	Total
In-country training	-	117.6	117.6
Observation visits	30.0	-	30.0
Short-term courses	126.0	-	126.0
Long-term participant training	224.0	-	224.0
Total	380.0	117.6	497.6

TABLE 11A

TRAINING

YEAR 1

	AID		
	$	¢	Total
In-country training 1/	-	14,701	14,701
Observation visits 2/	20,000	-	20,000
Short-term courses 3/	25,200	-	25,200
Long-term participant training 4/	-	-	-
Total	$45,200	$14,701	$59,901

TABLE 11B

TRAINING

YEAR 2

	AID		
	$	¢	Total
In-country training 1/	-	28,175	28,175
Observation visits 2/	10,000	-	10,000
Short-term courses 3/	25,200	-	25,200
Long-term participant training 4/	42,000	-	42,000
Total	$77,200	$28,175	$105,375

TABLE 11C

TRAINING
YEAR 3

	AID		
	$	¢	Total
In-country training 1/	-	36,825	36,825
Observation visits 2/	-	-	-
Short-term courses 3/	25,200	-	25,200
Long-term participant training 4/	84,000	-	84,000
Total	$109,200	$36,825	$146,025

TABLE 11D

TRAINING
YEAR 4

In-country training 1/	-	37,937	37,937
Observation visits 2/	-	-	-
Short- erm courses 3/	25,200	-	25,200
Long-term participant training 4/	70,000	-	70,000
Total	$95,200	$37,937	$133,137

TABLE 11E

TRAINING
YEAR 5

In-country training 1/	-	-	-
Observation visits 2/	-	-	-
Short-term courses 3/	25,200	-	25,200
Long-term participant training 4/	28,000	-	28,000
Total	$53,200	-	$53,200

Recurring Costs: $25,000 per year.

1/ In-Country Training:

Based on table on next page. $25,000 added each year for contingencies.

2/ Observations Visits:

15 individuals (including the heads of the regional centers) will travel (probably to Mexico and Guatemala) for approximately 3 weeks to observe similar programs. Cost is estimated at $2,000 per trip.

3/ Short-Term Courses:

30 persons will attend 6-12 week courses in the U.S. or third-countries, at an estimated cost of $4,200 each.

4/ Long-Term Participant Training:

8 persons will receive 2 years of study each, at the masters level. Cost is estimated at $14,000 per year. 3 will begin their studies in each of years 2 and 3, and 2 in year 4.

(For recurring costs, the GOP is expected to continue an in-country training program for the personnel within the project at an anticipated annual cost of $25,000).

A. IN-COUNTRY TRAINING

Year 1 (1978)

Type of Training	# of Participants	Contents	# Courses	Duration	Est. Cost	Yr.2(1979)
Personnel on board	42-Chief agents Agt.A-C & ED of H	Orientation on procedures of the new program	3(three)	2 days ea.	¢ 208,360	
Personnel not yet in service	39-Field workers	Technology. Transfer. Identification & Analysis of technological impediments	2(two)	15 days ea.	¢ 750,850	Yr.3(1980)
Personnel on board	39-Field workers 42-Extension agents	Planning programs. Implementation & evaluation	4(four)	3 days ea.	¢ 468,160	Yr.4(1981)
Personnel not yet in service	15-Administrative personnel	Administrative & accounting process	1(one)	1 week	¢ 200,000	
Personnel on board	2-Communications personnel	1 Serigraphy 1 Graphic arts	-c- -o-	3 months 3 months	¢ 100,000 ¢ 100,000	
--o--	96 --o--	--o--	10 courses	54 days	¢1,827,370	Total
--o-- --o- --o-- --o-- --o-- Personnel on board	30 Ext. agents 26 Field workers (26 Field workers (30 Ext.agents 8 Adm.personnel (65 Field workers (76 Ext.agents	--o-- --o-- --o-- --o-- Periodic seminars on results of field workers - Communications. Methodology Agric.evaluation	2(two) 1(one) 2(two) 1(one) 5 courses for each	2 days ea. 15 days 5 days 1 week 2 to 3 days ea. course	¢ 175,000 ¢ 550,000 ¢ 350,000 ¢ 100,000 ¢2,350,000 ¢3,525,000	Total
--o-- --o-- --o-- --o-- --o-- --o-	34 Ext.agents 26 Field workers 34 Ext.agents + 26 field workers 8 Adm.personnel --o-- 106 Ext.agents	--o-- --o-- --o-- --o-- --o-- --o--	2(two) 1(one) 2(two) 1(one) -o- 5 courses for each	2 days ea. 15 days 3 days 1 week -o- 2 to 3 days ea. course	¢ 250,000 ¢ 605,000 ¢ 400,000 ¢ 110,000 -o- ¢3,250,000 ¢4,615,000	Total
--o-- --o- --o-- --o--	29 Ext.agents 13 Field workers 29 Ext.agents + 13 field workers 8 Adm.personnel --o-- 139 Ext.agents 94 field workers	--o- --o- --o-- --o-- --o-- --o-- --o--	1(one) 1(one) 2(two) 1(one) -o- 5 courses for each	2 days 15 days 3 days 1 week -o- 2 to 3 days ea. course	¢ 280,000 ¢ 330,000 ¢ 270,000 ¢ 125,000 -o- ¢3,750,000 ¢4,755,000	Yr.4(1981) Total

TABLE 12

PURCHASED RESEARCH *

	A.I.D.		
	¢		
	Constant Dollars	Inflation	Total
Year 1	$ 20,000	-	$ 20,000
Year 2	30,000	$ 2,400	32,400
Year 3	30,000	4,992	34,992
Year 4	30,000	7,791	37,791
Year 5	30,000	10,814	40,814
Total	$140,000	$ 25,997	$165,997

Recurring Cost: $30,000.

* Upon request of a regional center and upon review by a coordinating committee, SEAG will issue contracts for research into a particular problem. The results of such research will be tested by the regional centers in their applied research program and will, if successful, eventually be demonstrated by the agencies.

The contracts will likely be with the Instituto Agronómico Nacional (IAN), with a more limited number going to the Central Regional de Investigaciones Agropecuarias at Capitán Miranda (CRIA), the Agronomy Faculty of the National University, and the private sector.

It is expected that Year 1 of the project, IAN and SEAG will jointly begin, under a contract with defined scope and objectives, a process of developing alternative strategies for each of the regions to have centers. This is expected to cost $20,000. Each year thereafter, it is expected that contracts averaging a total of $30,000 will be let. This is based on a study of current costs of research at IAN and CRIA.

AID will finance this research under the loan. All costs are budgeted as local currency. Inflation of 8% annually compounded is added in.

TABLE 13

MECHANIZATION
All Years
(US$ 000)

	A.I.D.			GOP	Total
	$	¢	Total	¢	
Personnel - New	-	-	-	75,855	75,855
Building	-	54,000	54,000	-	54,000
Equipment	24,000	6,000	30,000	-	30,000
Vehicles	11,111	-	11,111	-	11,111
Fuel	-	2,037	2,037	1,431	3,468
Lubricants	-	269	269	187	456
Maintenance	400	383	783	549	1,332
Parts	1,524	-	1,524	252	1,776
Insurance	-	1,307	1,307	917	2,224
Per Diem	-	1,015	1,015	1,525	2,540
Prototypes	20,000	168,000	188,000	-	188,000
Contingency	5,703	23,301	29,004	-	29,004
Inflation	5,080	41,000	46,080	17,281	63,361
Total	$67,818	$297,312	$365,130	$97,997	$463,127

Total at current prices: $399,766

Note: The Swiss Government is expected to donate the services of one agricultural engineer for a period of approximately three years.

TABLE 14A

MECHANIZATION

YEAR 1

	A.I.D.			GOP	
	$	¢	Total	¢	Total
Personnel - New 1/	-	-	-	7,095	7,095
Building 2/	-	54,000	54,000	-	54,000
Equipment 3/	24,000	6,000	30,000	-	30,000
Vehicles 4/	11,111	-	11,111	-	11,111
Fuel 5/	-	-	-	-	-
Lubricants 6/	-	-	-	-	-
Maintenance 7/	-	-	-	-	-
Parts 8/	762	-	762	-	762
Insurance 9/	-	-	-	-	-
Per Diem 10/	-	-	-	-	-
Prototypes 11/	-	-	-	-	-
Contingency 12/	3,587	6,000	9,587	-	9,587
Totals	$39,460	$66,000	$105,460	$7,095	$112,555

TABLE 14B

MECHANIZATION

YEAR 2

	A.I.D.			GOP	
	$	¢	Total	¢	Total
Personnel - New 1/	-	-	-	14,190	14,190
Building 2/	-	-	-	-	-
Equipment 3/	-	-	-	-	-
Vehicles 4/	-	-	-	-	-
Fuel 5/	-	711	711	156	867
Lubricants 6/	-	94	94	20	114
Maintenance 7/	100	173	273	60	333
Parts 8/	-	-	-	63	63
Insurance 9/	-	456	456	100	556
Per Diem 10/	-	444	444	191	635
Prototypes 11/	5,000	42,000	47,000	-	47,000
Contingency 12/	510	4,388	4,898	-	4,898
Inflation 13/	449	3,861	4,310	1,182	5,492
Totals	$ 6,059	$52,127	$58,186	$15,962	$74,148

Total at current prices: $68,656.

TABLE 14C

MECHANIZATION

YEAR 3

	A.I.D.			GOP	
	$	¢	Total	¢	Total
Personnel - new 1/	-	-	-	14,190	14,190
Building 2/ /Equipment 3/ Vehicles 4/	-	-	-	-	-
Fuel 5/	-	598	598	269	867
Lubricants 6/	-	79	79	35	114
Maintenance 7/	100	130	230	103	333
Parts 8/	-	-	-	63	63
Insurance 9/	-	384	384	172	556
Per Diem 10/	-	317	317	318	635
Prototypes 11/	5,000	42,000	47,000	-	47,000
Contingency 12/	510	4,351	4,861	-	4,861
Inflation 13/	934	7,964	8,898	2,521	11,419
Totals	$6,544	$55,823	$62,367	$17,671	$80,038

Total at current prices: $68,619.

TABLE 14D

MECHANIZATION

YEAR 4

	A.I.D.			GOP	
	$	¢	Total	¢	Total
Personnel - New 1/	-	-	-	20,190	20,190
Building 2/ /Equipment 3/ Vehicles 4/	-	-	-	-	-
Fuel 5/	-	468	468	399	867
Lubricants 6/	-	62	62	52	114
Maintenance 7/	100	80	180	153	333
Parts 8/	762	-	762	63	825
Insurance 9/	-	300	300	256	556
Per Diem 10/	-	191	191	444	635
Prototypes 11/	5,000	42,000	47,000	-	47,000
Contingency 12/	586	4,310	4,896	-	4,896
Inflation 13/	1,675	12,313	13,988	5,599	19,587
Totals	$8,123	$59,724	$67,847	$27,156	$95,003

Total at current prices: $68,619.

TABLE 14E

MECHANIZATION

YEAR 5

	A.I.D.			GOP	
	$	¢	Total	¢	Total
Personnel - New 1/	-	-	-	20,190	20,190
Building 2//Equipment 3// Vehicles 4/	-	-	-	-	-
Fuel 5/	-	260	260	607	867
Lubricants 6/	-	34	34	80	114
Maintenance 7/	100	-	100	233	333
Parts 8/	-	-	-	63	63
Insurance 9/	-	167	167	389	556
Per Diem 10/	-	63	63	572	635
Prototypes 11/	5,000	42,000	47,000	-	47,000
Contingency 12/	510	4,252	4,762	-	4,762
Inflation 13/	2,022	16,862	18,884	7,979	26,863
Totals	$7,632	$63,638	$71,270	$30,113	$101,383

Total at current prices: $74,520.

TABLE 14F

MECHANIZATION

Recurring Costs* (in US$)

Personnel - New	$20,190
Building/Equipment/Vehicles	-
Fuel	867
Lubricants	114
Maintenance	333
Parts	317
Insurance	556
Per Diem	635
Prototypes	47,000
Total	$70,012

* Excludes contingency and inflation factors.

1/ Personnel:

IAN will form a team by the second half of Year 1 to devote full-time to the program. It will consist of: 1 "ingeniero agrónomo" - ₡53,000/mo.
1 shop steward - ₡46,000/mo.
2 Welders/mechanics at ₡25,000/mo/each.

In Year 4, an agricultural engineer will join the team, upon return from studying overseas under the participant training component of the project. His salary will be ₡63,000/mo.

2/ Building:

The first year of the project, AID will finance a new building at IAN to house the mechanization program at a cost of $54,000, based on USAID's Regional Engineer's estimate.

3/ Equipment:

The first year AID will finance equipment costing $30,000, 80% of which is expected to be foreign exchange procurement.

4/ Vehicles:

The first year of the project IAN will obtain:

1 diesel pick-up at $9,524
1 trailer at $1,587

The IAN personnel will also be able to make use of the vehicles at the regional center for Cordillera Department, located at IAN.

5/ Fuel:

The pickup is expected to use 350 liters of diesel fuel per months at ₡26. Financing will be shared as follows:

First year (Year 2 of Project): AID 82%, GOP 18%
Second " (Year 3 of Project): AID 69%, GOP 31%
Third " (Year 4 of Project): AID 54%, GOP 46%
Fourth " (Year 5 of Project): AID 30%, GOP 70%

6/ Lubricants:

8 liters per month at ₡150, shared under same formula.

7/ Maintenance:

₡3,500 per month. Same funding formula. 30% estimated as dollar procurement.

8/ Parts:

A three year stock of imported parts (estimated at $254 per year) will be ordered in Years 1 and 4 and financed by AID. An estimated ₡8,000 ($63) per year in locally bought parts will be financed by the GOP.

9/ Insurance:

Calculated at 5% of the value of the pickup and trailer. Financing shared order same formula as in 5/ above.

10/ Per Diem:

Estimated at 100 days per year at ₡800, shared as follows:

First year	(Year 2 of Project):	AID 70%, GOP 30%
Second year	(Year 3 of Project):	AID 50%, GOP 50%
Third year	(Year 4 of Project):	AID 30%, GOP 70%
Fourth year	(Year 5 of Project):	AID 10%, GOP 90%

11/ Prototypes:

This is the crucial element of this component of the project. It is expected that each year of the project starting Year 2, 2 machines will be imported at $2,500 each, 3 will be purchased locally at $2,000 each, and 3 will be designed from scratch at $2,000 each. Of designs found potentially viable, 15 prototypes will be constructed annually for testing, also at $2,000 each. AID will finance this element during the Project.

12/ Contingency:

10% additional of AID columns.

13/ Inflation:

8% annual factor.

TABLE 15

SEED MULTIPLICATION*
($000)

	AID	GOP
	¢	¢
Year 1	150.0	20.0
Year 2	150.0	20.0
Year 3	150.0	20.0
Year 4	-	20.0
Year 5	-	20.0
	450.0	100.0

* This component of the project will be carried out by the National Seed Service (SENASE). AID's inputs consist of a revolving fund to finance the production of improved seeds. The GOP's inputs are "in-kind", representing the personnel and overhead devoted to this segment of the project.

TABLE 16

ADMINISTRATION*

	A.I.D.			GOP		
	$	₡	Total	₡		
				Constant	Inflation	Total
Year 1	30,000	12,800	42,800	14,571	-	14,571
Year 2	30,000	-	30,000	17,429	1,394	18,823
Year 3	-	-	-	20,286	3,375	23,661
Year 4	-	-	-	23,143	6,010	29,153
Year 5	-	-	-	23,143	8,343	31,486
Total	$60,000	$12,800	$72,800	$98,572	$19,122	$117,694
Recurring costs:				$23,143		

* SEAG will establish a separate administrative section. It will begin with a director (₡63,000 per month) and three clerks (at ₡30,000 per month). In each of Years 2-4, an additional clerk will be added.

The AID inputs are expected to be imported office machinery and equipment, and a limited amount of local purchases.

Inflation of 8% per year is added to the GOP inputs.

A most important input for the administrative section - technical assistance - is included under the Technical Assistance budget of the Project (Tables 17 and 18).

Each regional center will also have an administrative section. Personnel, furniture, and equipment for these sections were included under the extension budget for the regional centers (Tables 8A-8E).

TABLE 17

TECHNICAL ASSISTANCE

ALL YEARS
(US$000)

	AID		
	$	₡	Total
For SEAG's Ag.Communications Section	302.0	15.0	317.0
For SEAG's Livestock Section	108.0	48.0	156.0
For SEAG's Home Ec.Section	36.0	12.0	48.0
For SEAG's Program & Evaluation Sec.	210.0	48.0	258.0
For SEAG's Training Section	90.0	12.0	102.0
For SEAG's Administration Section	210.0	-	210.0
Total in constant dollars	956.0	135.0	1,091.0
Inflation	119.2	26.6	145.8
Totals	1,075.2	161.6	1,236.8

TABLE 18A

TECHNICAL ASSISTANCE

YEAR 1

	A.I.D.		
	$	₡	Total
Ag. Communications Section	35,000	-	35,000
Livestock Section	-	-	-
Home Ec. Section	18,000	-	18,000
Program and Evaluation Section	35,000	-	35,000
Training Section	36,000	3,000	39,000
Administration Section	35,000	-	35,000
Totals	$159,000	$3,000	$162,000

TABLE 18B

TECHNICAL ASSISTANCE

YEAR 2

	A.I.D.		
	$	₡	Total
Ag. Communications Section	178,000	6,000	184,000
Livestock Section	54,000	12,000	66,000
Home Ec. Section	18,000	3,000	21,000
Program and Evaluation Section	70,000	18,000	88,000
Training Section	18,000	3,000	21,000
Administration Section	70,000	-	70,000
Total in constant dollars	408,000	42,000	450,000
Inflation	32,640	3,360	36,000
Totals	$440,640	$45,360	$486,000

TABLE 18C

TECHNICAL ASSISTANCE

YEAR 3

	A.I.D.		
	$	₡	Total
Ag. Communications Section	53,000	3,000	56,000
Livestock Section	18,000	12,000	30,000
Home Ec. Section	-	3,000	3,000
Program and Evaluation Section	35,000	-	25,000
Training Section	18,000	3,000	21,000
Administration Section	70,000	-	70,000
Total in constant dollars	194,000	21,000	215,000
Inflation	32,282	3,494	35,776
Totals	$226,282	$24,494	$250,776

TABLE 18D

TECHNICAL ASSISTANCE

YEAR 4

	A.I.D.		
	$	£	Total
Ag. Communications Section	18,000	3,000	21,000
Livestock Section	18,000	12,000	30,000
Home Ec. Section	-	3,000	3,000
Program and Evaluation Section	70,000	30,000	100,000
Training Section	18,000	3,000	21,000
Administration Section	35,000	-	35,000
Total in constant dollars	159,000	51,000	210,000
Inflation	41,294	13,245	54,539
Totals	$200,294	$64,245	$264,539

TABLE 18E

TECHNICAL ASSISTANCE

YEAR 5

	A.I.D.		
	$	£	Total
Ag. Communications Section	18,000	3,000	21,000
Livestock Section	18,000	12,000	30,000
Home Ec. Section	-	3,000	3,000
Program and Evaluation Section	-	-	-
Training Section	-	-	-
Administration Section	-	-	-
Total in costant dollars	36,000	18,000	54,000
Inflation	12,978	6,489	19,467
Totals	$ 48,978	$24,489	$ 73,467

Ag. Communications Section:

long-term: 2 yrs. starting second half of Year 1
short-term international: 18 mo. yr. 2
3 mo. yr. 3
3 mo. yr. 4
3 mo. yr. 5
short-term national : 6 mo. yr. 2
3 mo. yr. 3
3 mo. yr. 4
3 mo. yr. 5

Livestock Section:

short-term international: 9 mo. yr.2
3 mo. yr. 3
3 mo. yr. 4
3 mo. yr. 5
short-term national : 12 mo. each yr. 2-5

Home Ec. Section:

short-term international: 3 mo. yr. 1
3 mo. yr. 2
short-term national : 3 mo. each yr. 2-5

Program and Evaluation Section:

long-term: 2 yrs. starting second half of Year 1
1 yr. starting Year 4
short-term international: -
short-term national : 18 mo. yr. 2
30 mo. yr. 4

Training Section:

short-term international:	6 mo. yr. 1 3 mo. yrs. 2-4
short-term national :	3 mo. each of yrs. 1-4

Administration Section:

long-term: 3 yrs. starting second half of year 1.

Costs:

$70,000/yr. long-term advisor
$ 6,000/mo. short-term advisor (international)
$ 1,000/mo. short-term advisor (national)

Inflation of 8% annually, compounded, is added.

UNATTACHED ANNEX B

SMALL FARM TECHNOLOGY PROJECT - TECHNICAL FEASIBILITY

1. DESCRIPTION OF THE AGRO-MECHANICAL SCHOOL IN CAACUPE

The Agromechanical School started activities in June, 1975 with an initial enrollment of 15. The school is the result of a joint venture between Helvetas, a Swiss organization providing assistance to developing countries, and the Ministry of Agriculture and Livestock.

The objective of the school is mainly to train middle level farm mechanization technicians capable of repairing and maintaining the increasing number of farm equipment and implements being used in the country. The training goes even further to enable students to make needed tools, spare parts, and implements. Students are trained to become good generalists with a wide array of skills including repair of engines and farm implements, welding, drilling, milling, forging, etc. as well as repairing the electric, hydraulic, and transmission systems of tractors and vehicles.

Generation of employment for graduates of the school is based on the assumption that students, who are mainly recruited from farming areas, would return to incorporate new talent into existing repair shops or establish new ones in their home towns. Their potential as a vehicle for technology transfer should not be overlooked either. As a matter of principle, candiades from farming areas are preferred over city and non-farming area candidates.

The school is run by a director, a Swiss engineer from Helvetas, and his local counterpart, who acts as codirector. Two Swiss instructors are in charge of the two sections of the school (basic workshop and engines sections) assisted by 8 Paraguayan instructors, four in each section.

The training program of the school consists of five semesters with a total of 850 hours of instruction per semester. The first four semesters are conducted at the facilities of the School in Caacupé. The last semester will be spent for on-the-job training during which the student will actually be working in a private shop out in the field. Following this last semester, students return to school for a three month general review of the theory and practice, final examination, and graduation.

Enrollment is limited to a maximum of 20 students. Presently, there are 14 students in the first group, 17 in the second, and 20 in the third group. The school provides free tuition, room and board for all students. Activities at the school are from approximately mid January to mid December.

Attached is detailed information on curriculum, school regulations, etc.

Funding

Helvetas (5 years)

Equipment and tools	¢16,000,000	US$126,984
Teaching material and aids	5,000,000	39,683
Salaries & vehicles (Swiss technicians)	34,000,000	269,841
	¢55,000,000	US$436,508

MAG

Buildings (shops & dormitory) (5 years)	¢27,000,000	US$214,286
Salaries* (1977)	5,292,000	42,000
Materials & supplies (1977)	4,180,000	33,175

Facilities of the school consist of three big workshops (one for the basic workshop, one for the engines section, and one for forging) with adjoining classrooms, dormitories for students, offices, and a house for the instructors.

MAG financed construction of all the buildings under the PIDAF Loan and Helvetas provided all the equipments, tools, audiovisual materials and equipment, etc. for the school.

* Include the salaries of the codirector, 8 instructors, cooks, secretaries, secretary, physician, etc.

2. DETAILED LIST OF EQUIPMENT TO BE USED AT THE AGRO-MECHANICAL SCHOOL

1. Welder
   a) Acetylene Gas
   b) Electric Arc
2. Metal Band Saw
3. Small Sheet Metal Brake
4. Tool Grinder 1/3 HP - Bench type with tool attachments
5. Drill Press - For light and heavy duty work
6. Electric Generator - 2500 watt
7. 3-Portable drills (1/4", 3/8", 1/2")
8. Anvil
9. Air compressor, complete with air tank, gauge, hose and controls
10. Reciprocating metal saw
11. Metal Lathe
12. Grease dispenser
13. Hydraulic press
14. Hoist (portable). 1 ton capacity
15. Portable grinder
16. Riveting set for sheet metal
17. Chain breaker (Roller - Link chain)
18. 2-Benches (1-metal) (1-wood)
19. Benches vises (2-metal) (1-wood)
20. Inspection tools
21. Micrometer set
22. Tube cutting & bending & flaring set
23. Pipe threading set
24. 6-Hack saws (hand) and blades
25. Hammers - Various sizes
26. Hammers - Sleg
27. Pipe cutters
28. Pipe bender
29. Tool kits - For general mechanic work
30. Pipe wrenches - Set
31. Hydraulic jacks - 5 and 10 ton capacity
32. Tap and die set (English metric)
33. 2-Tin snips
34. 1-Soldering gun - Solder - Rosin core and acid core
35. 1-Propane torch & extra cylinders
36. Set of various sizes - files, chisels & punches
37. 1-Vacuum cleaner

Wood Working Tools

1. Bench saw
2. Collection of wood working hand tools
3. Jointer
4. Portable sander

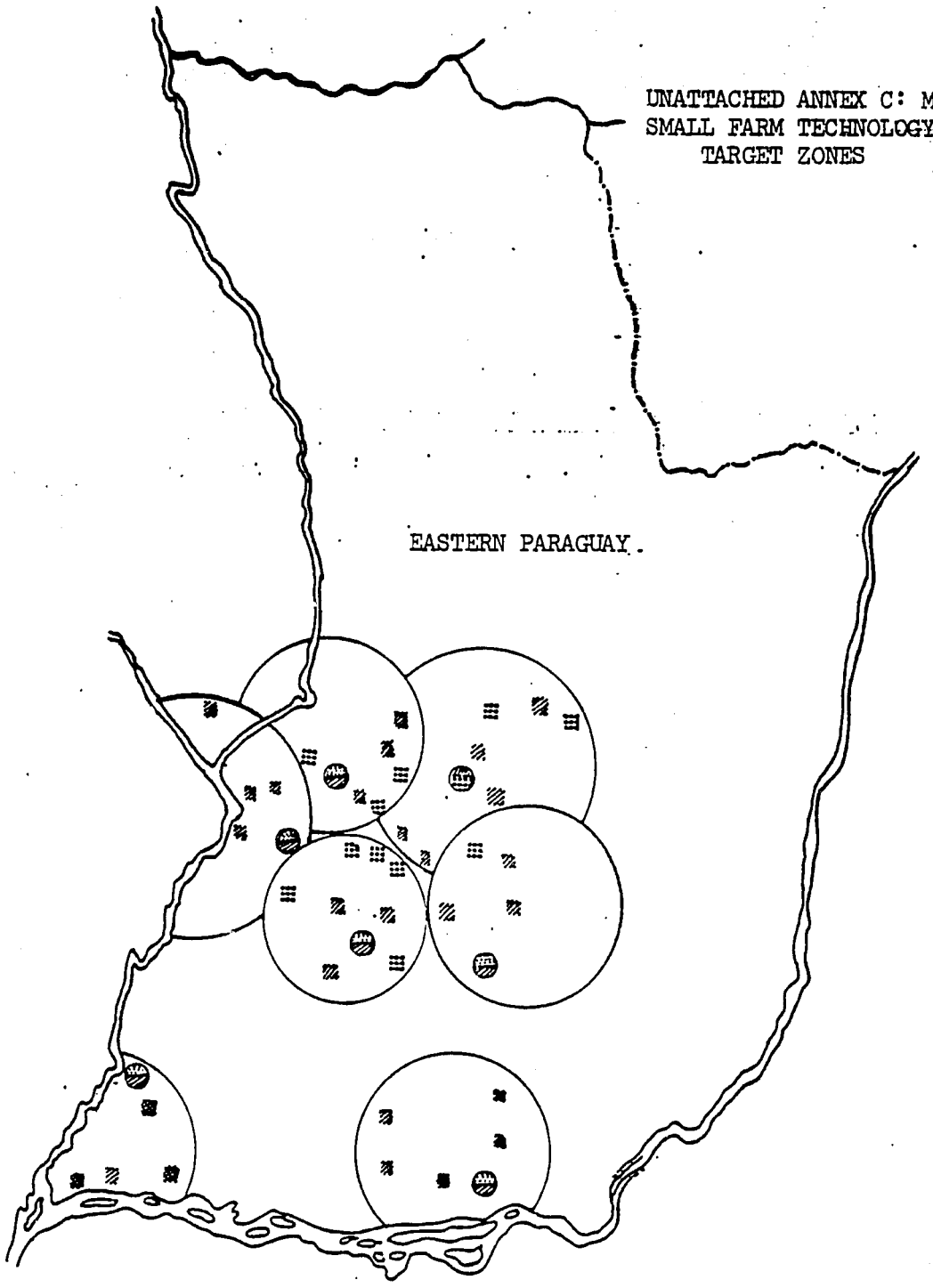
Instruments

1. 3-Drawbar pullmeters dynamometers (0-500 lbs.)(0-1000 lbs.)(0-5000 lbs.)
2. Stop watches
3. Tapes
4. Tachometer - Rev. counter
5. PTO Dynamometer - (0-100 H.P.) capacity
6. Drying oven for soils and agricultural products
7. Penetrometer
8. Fuel measuring equipment
9. Platform scales (0-500 lbs.)
10. Set of spring scales

Office Instruments

Drafting Instruments
2-Drafting tables & stools
Desks & chairs
Bookcases
Drawer type files
Chairs
Slide projector and screen
Camera

UNATTACHED ANNEX C: MAPS
SMALL FARM TECHNOLOGY—
TARGET ZONES



REFERENCIAS

- Agencias SEAG creadas
- Agencias SEAG a crearse
- Centro Regional con Agencias SEAG creadas
- Centro Regional con Agencias SEAG a crearse

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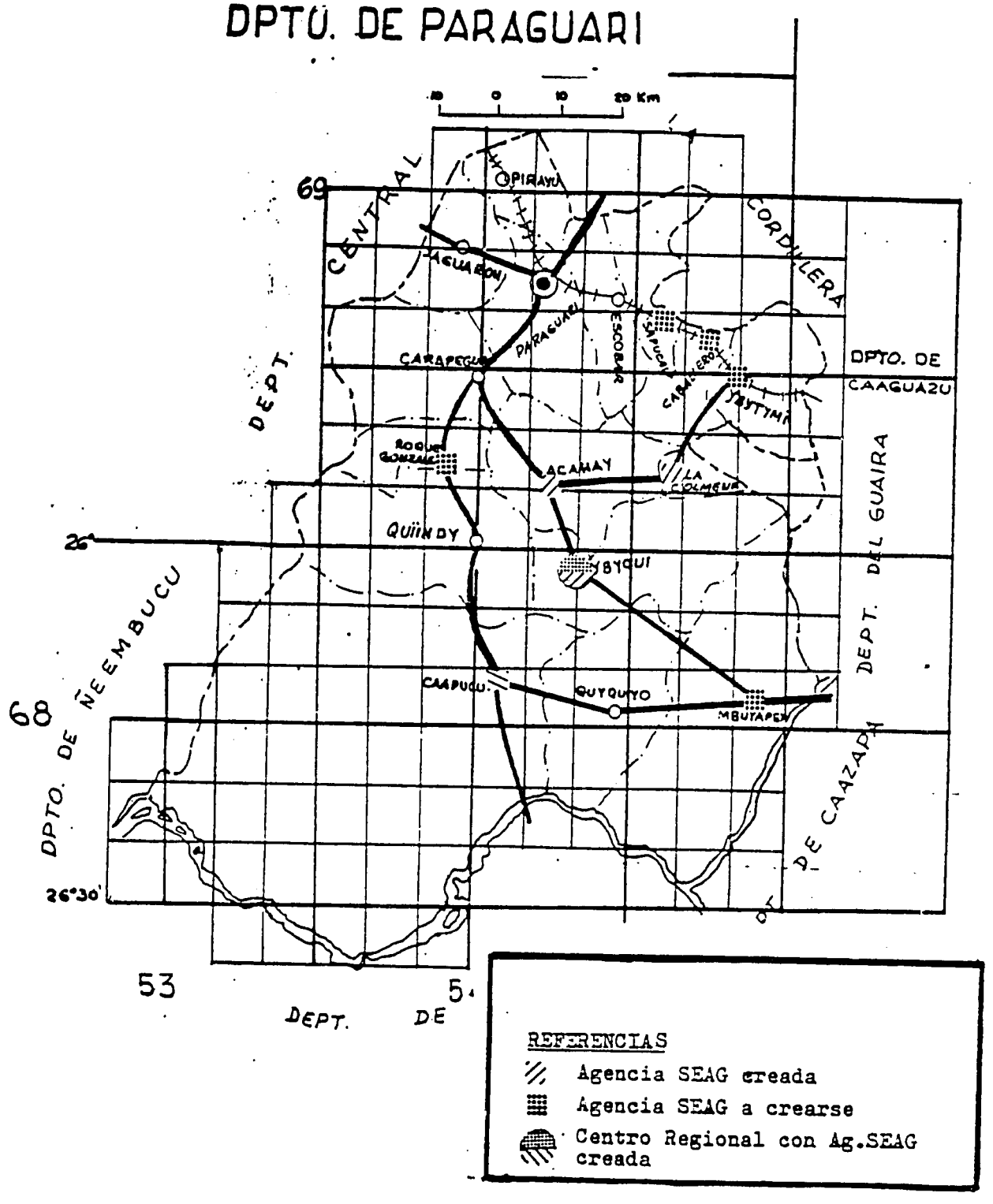

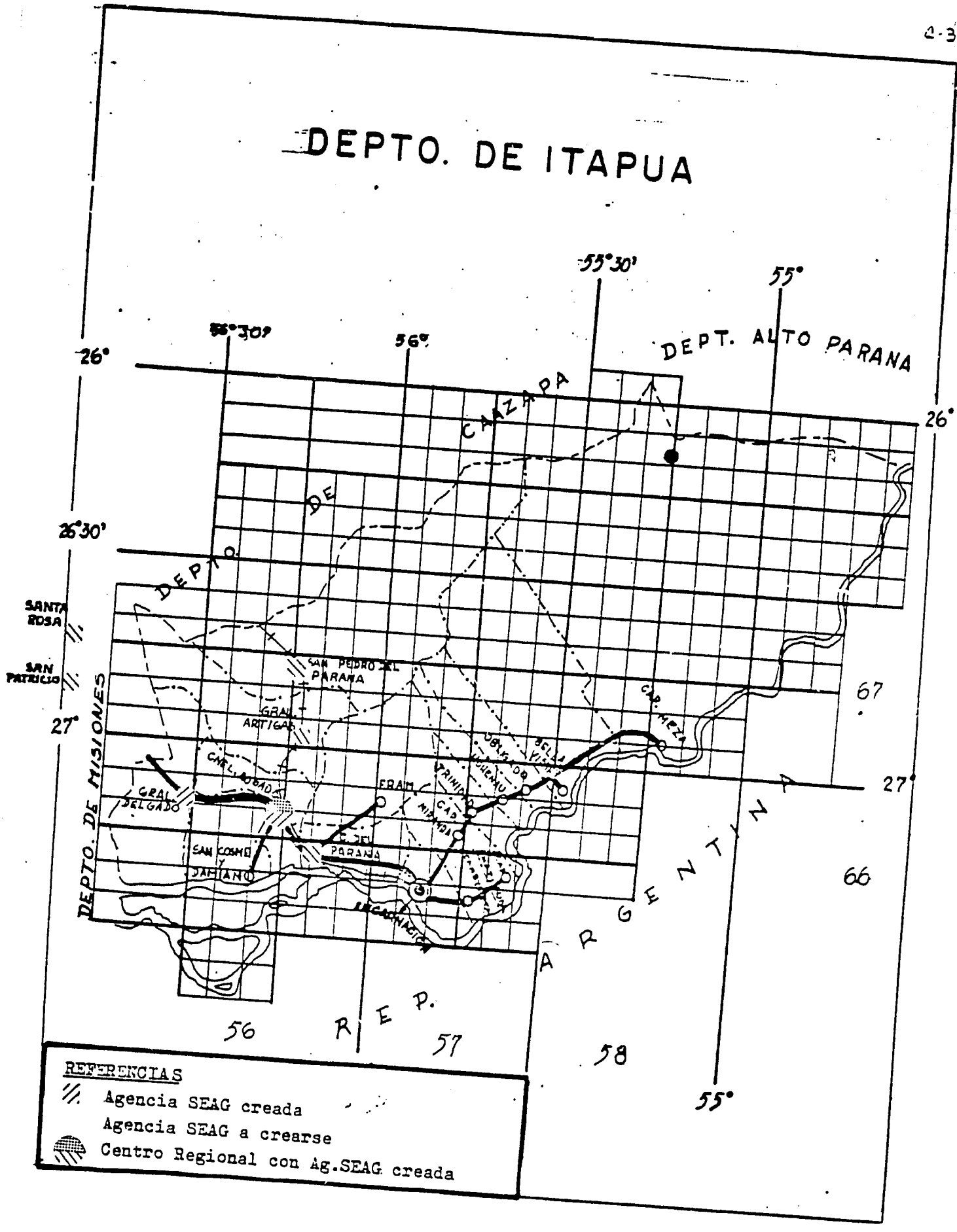
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55°
56°30'
56°
26°
DEPT. ALTO PARANA
CAAZAPA
DEPTO. DE
26°30'
SANTA ROSA
SAN PATRICIO
DEPTO. DE MISIONES
SAN PEDRO DEL PARANA
GRAL. ARTIGAS
CAAL. OBAD
GRAL. DELGADO
FRAM
TRINIDAD
CAB
MIRANDA
E. DEL PARANA
SAN COSME Y DAMIAN
ENCARNACION
CAP. MEZA
BELLA VISTA
67
66
27°
ARGENTINA
REP.
56
57
58
55°
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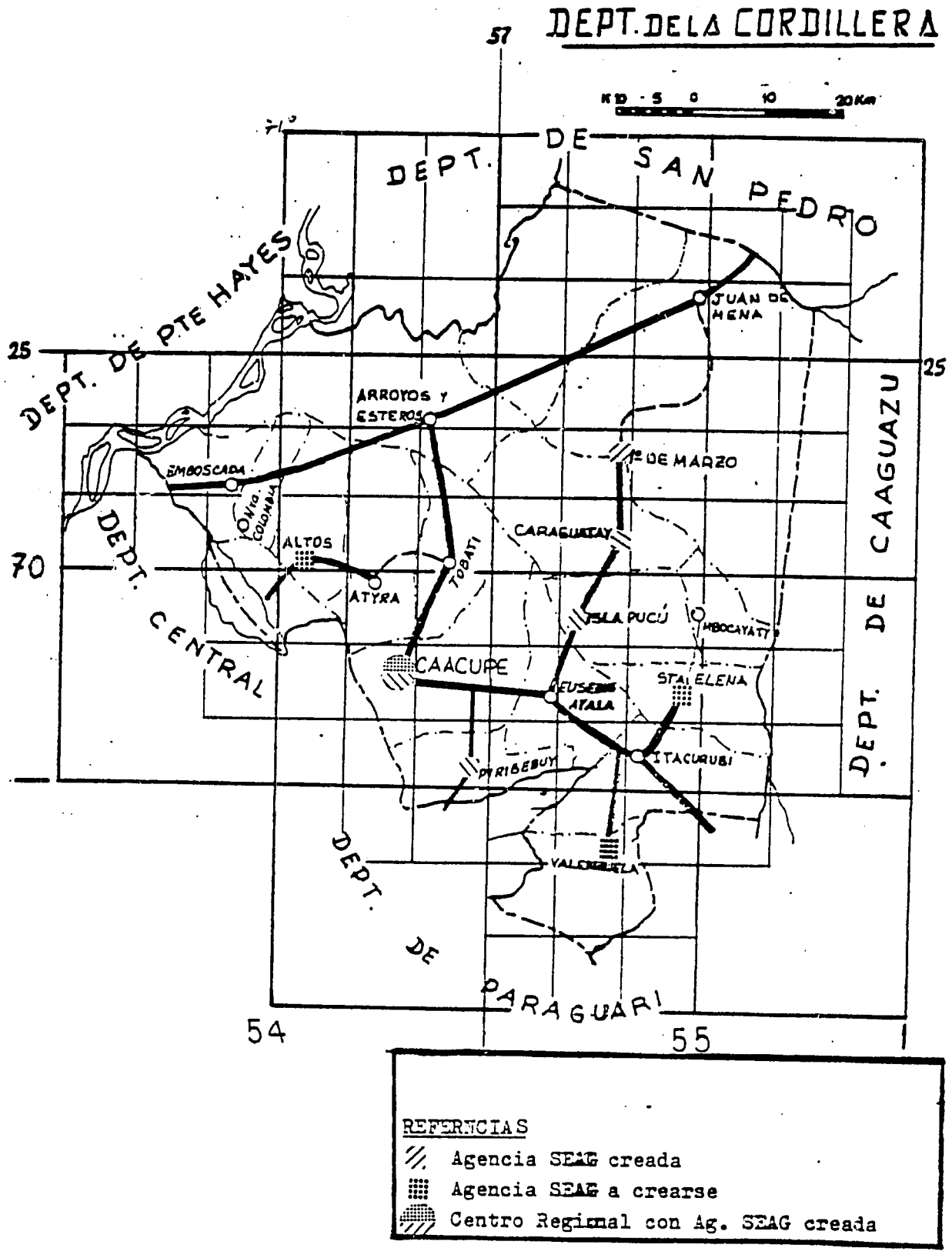
Agencia SEAG a crearse
Centro Regional con Ag.SEAG creada



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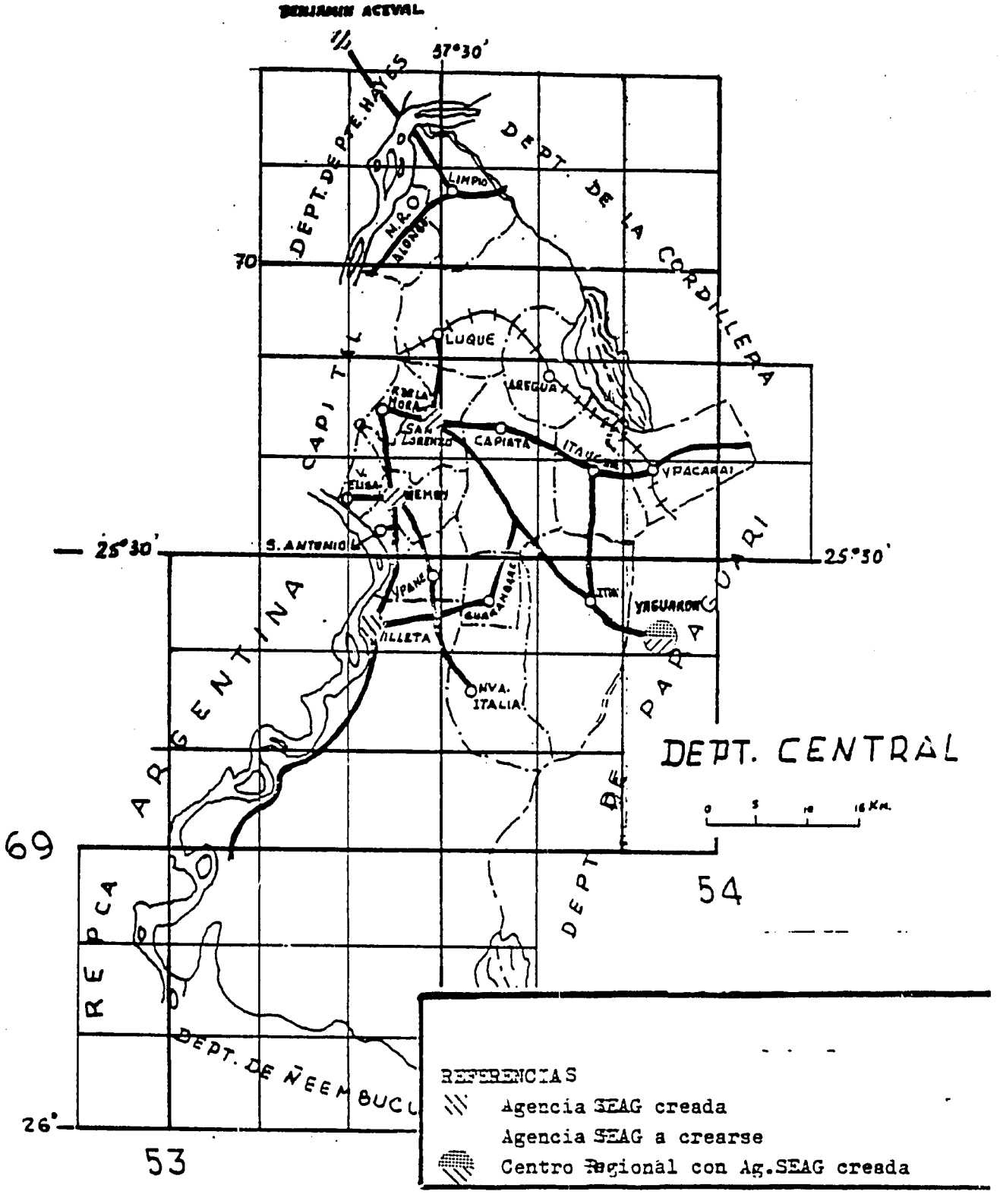
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57°30'
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DEPT. DE LA CORDILLERA
LIMPIO
N.A.O.
ALONSO
70
LUQUE
ARREGUA
CAPIATA
ITAUGUA
YPACARAI
SAN LORENZO
VILLA ELISA
NEMBY
25°30'
S. ANTONIO
YPANE
GUARAMBARE
ITA
YAGUARON
VILLETA
NVA. ITALIA
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69
54
53
26°
DEPT. DE ÑEEMBUCU
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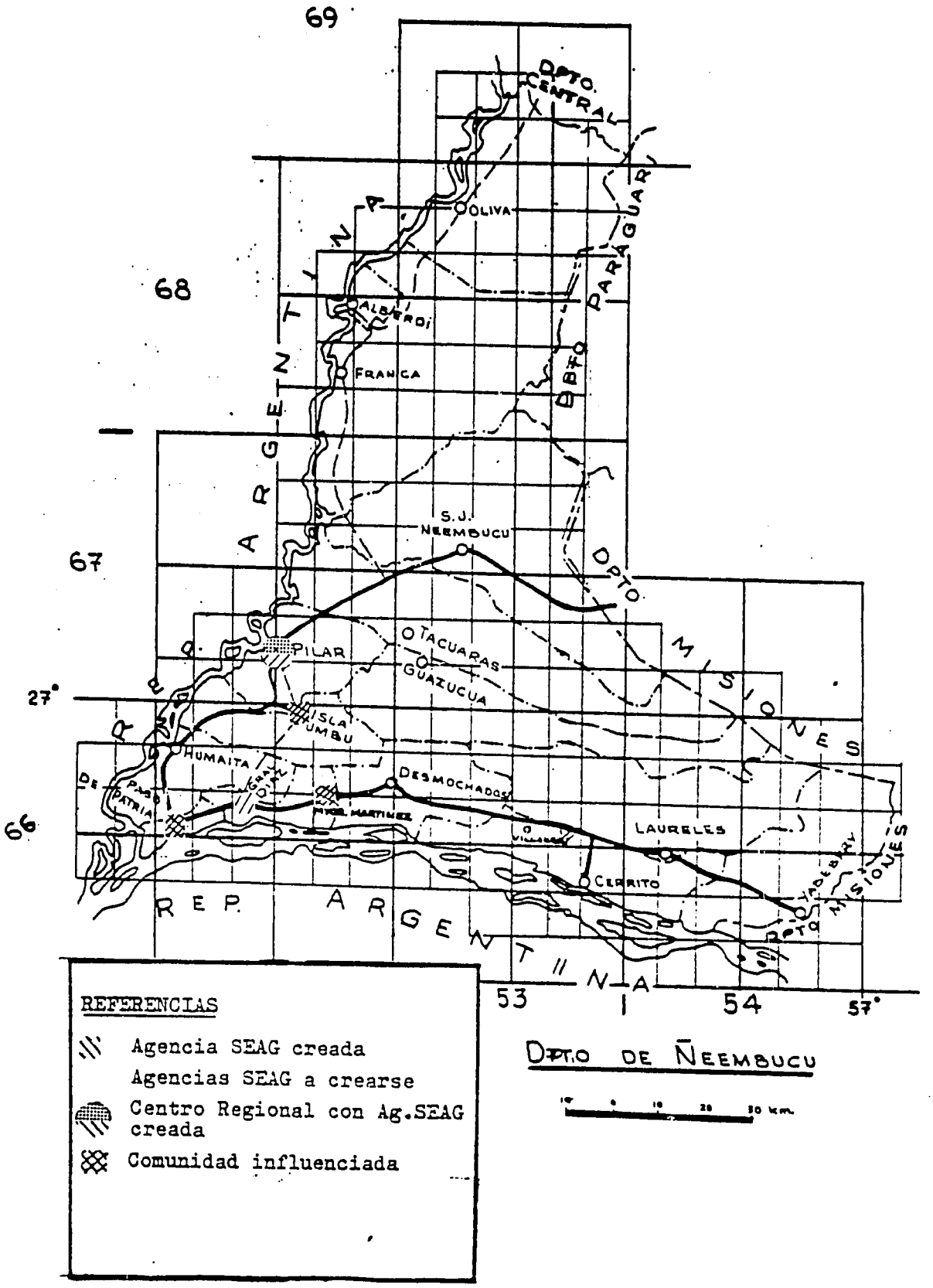
Agencia SEAG a crearse
Centro Regional con Ag. SEAG creada


69
68
67
66
27°
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54
57°
DPTO. CENTRAL
OLIVA
ALBERDI
FRANCA
PARAGUAY
DPTO
S.J. NEEMBUCU
PILAR
OTACUARAS
GUAZUCUA
ISLA UMBU
HUMAITA
DESMOCHADOS
LAURELES
CERRITO
PTO. PATRIA
ARGENTINA
REP. ARGENTINA
MISIONES
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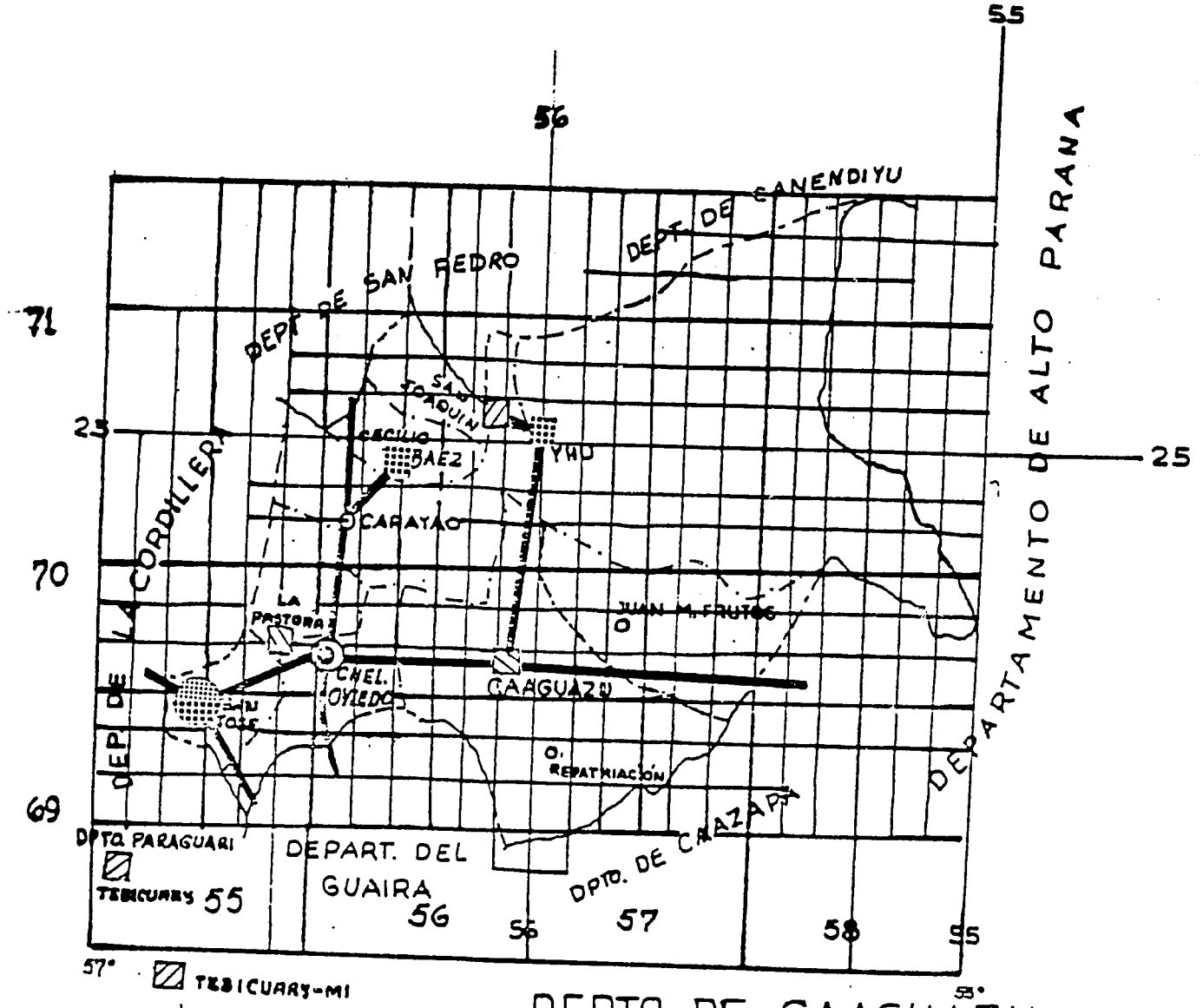

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