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

PROJECT PAPER

PERU

SOY & CORN PRODUCTION ON SMALL FARMS

Project Number: 527-15-130-149

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Department of State **TELEGRAM**

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SUBJECT: SOY AND CORN PRODUCTION ON SMALL FARMS GRANT PP

SUBJECT PROJECT IS HEREBY APPROVED AT A LIFE OF PROJECT
LEVEL OF 1,972,000 DOLS; WITH 840,000 DOLS IN THE TO.
USAID IS AUTHORIZED TO NEGOTIATE A PROJECT AGREEMENT
CONSISTENT WITH THIS APPROVAL. AVICE OF ALLOTMENT
FOLLOWS BY IMMEDIATE CABLE. ROBINSON

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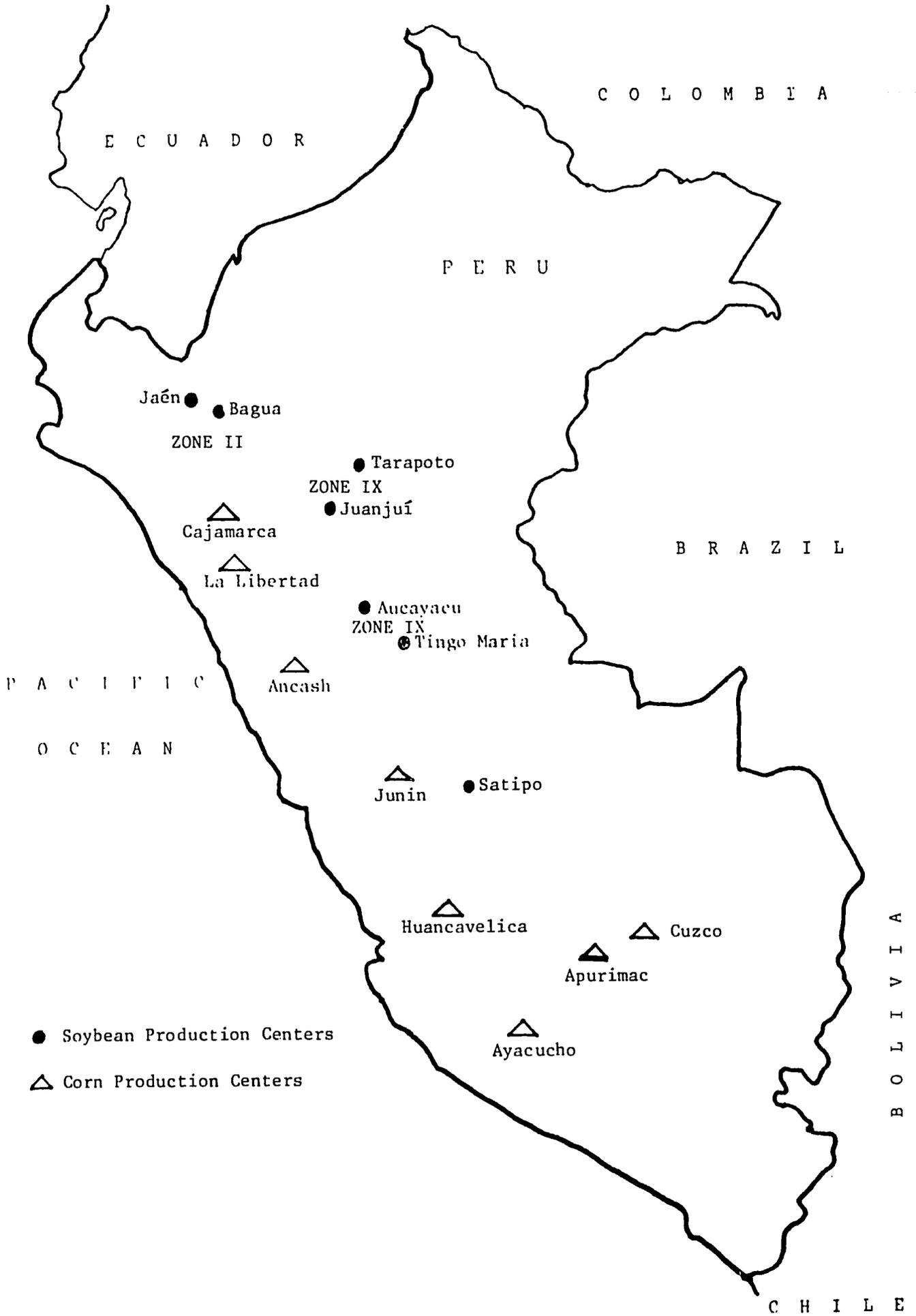
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LIST OF ABBREVIATIONS

AG BANK	Agrarian Bank
CRIA	Regional Agricultural Research Center
DGI	Direccion General de Investigacion (Research)
DGP	Direccion General de Produccion
EPSA	Peruvian Agricultural Services Enterprise
IIAI	Agro-Industrial Research Institute
MIN FOOD	Ministry of Food
PCIM	Cooperative Corn Research Program
PIDES	Integrated Plan for Soybean Development
UNA	National Agrarian University



B. RECOMMENDATIONS

USAID/Peru recommends authorization of a Grant of \$1,972,000 during FY TQ-80 to assist the government of Peru to achieve self-sustaining growth in the small farm production of improved corn and soybeans, thus facilitating the consumption of increased corn and high nutrition soybean products by the poor.

C. DESCRIPTION OF THE PROJECT

1. Major Activities:

This Project includes two programs, one for floury corn production improvement in the mountains and one for soybean production and research in high jungle areas.

a. Soybeans:

This project element will provide up to 122 months of technical services from a qualified U.S. contractor in agronomic research, extension agronomics, soy processing, consumer research, grades and standards, and economics. Contract personnel will work with 60 technicians of the Ministry of Food assigned to soybean program research and extension to:

- (1) Demonstrate and promote soybean production
- (2) Conduct research in soybean varieties to adapt existing varieties to Peruvian conditions and to breed new varieties for Peru.
- (3) Develop techniques for producing soy products for Peruvian consumers.
- (4) Produce certified seed
- (5) Consumer test soy products
- (6) Perform continuing financial and economic analysis of soybean production and processing.

To facilitate the foregoing research and extension activities, AID will provide research equipment, vehicles for advisors and local technicians and processing equipment for limited production of soybean derivatives. The GOP will provide, in addition to counterpart salaries, credit, research and extension facilities, a fund for seed production and commercial plantings as well as marketing facilities and equipment.

To broaden the existing technological base and ensure continuation of the activity beyond project completion, AID will sponsor long-term academic training and short-term studies totaling 21 1/2 years of training. Participants will be sent abroad for training as early as possible so as to obtain their services before project completion. However, their major function will be to assure the presence of the technical skills required for a long-term soybean production effort. In addition, the project will provide on-the-job and short-term, in-country training for technicians who will be involved in the near-term production effort. A schedule for this training, the specialties involved and the cost is detailed in Annex B.

The end of project objective is soybean products available for consumption as food in commercial quantities based on domestic production. The latter is targeted to increase from a present near zero base to about 54,000 MT by 1980. In addition, at the end of the project there should be in existence the necessary institutional framework (trained personnel, seed network, credit, production and commodity research) for self sustaining growth of production and processing of soybeans. The social objective of new economic opportunities for small farmers and new low cost, high quality food for the poor will also have been achieved.

b. Corn:

The project will provide up to 33 months of expert technical assistance in corn plant improvement, extension, plant pathology, corn quality improvement, and soil fertility. Foreign-based technicians will work with 90 research and extension personnel assigned to the highland corn program to:

- (1) Expand production and acceptance of improved highland corn seed.
- (2) Develop extension networks
- (3) Improve highland corn varieties' yields
and resistance to harsh environmental conditions.

AID contributions to the Project will include vehicles to facilitate extension activities and research and demonstration equipment for personnel located in the project areas.

Seed will be produced by the GOP, which will also provide counterpart salaries and support, in addition to research facilities. No separate credit window is contemplated because credit is not viewed as essential for this program.

While Peru has had success in hybrid corn production in lowland and coastal regions, highland corn has been relatively neglected as compared with coastal hybrids. There is a small nucleus of technicians knowledgeable in highland corn research and production. However, to expand the group to the extent necessary for the long-term conduct of the highland corn program, the Project will fund 60 months of short-term non-degree training abroad, 60 months of short-term training at the National Corn Program Center and six years of academic training at the National Agrarian University.

The end of project objective is the production of improved corn varieties by small farmers on 36,000 hectares of sierra land,

and the institutional network for self-sustaining growth in highland corn production.

2. Executing Agencies

a. The Director Superior, MinFood has overall authority and responsibility for coordinating all Project activities. The production and research units of MinFood (DGP and DGI) (and all other MinFood units) are under his direct operational control, as is EPSA, the marketing agency, and IIAI.

b. The DGP will program and supervise all production aspects, both in soybeans and corn. This will be accomplished through Zonal Offices and their subordinate Production Agencies (Extension Offices) and "producers' nuclei", groups of farmers who produce specific crops which are subject to national programming. (Soybeans are the only oil crop subject to this programming; floury corn is also in this category.) Each Production Agency will have one or more specialists in each programmed crop. These specialists will work in one crop only, not across the board in several commodities as in the traditional extension system. To do this DGP has over 2500 personnel, a number that is growing as the new production system is implemented. About 90% of these employees are classified as mid-level technicians and 10% have degrees in Agronomy, Economics and other professional skills. A diminishing number (now about 20%) of these are located in Lima.

A direct linkage is to be established between the farmer groups concerned with a specific crop and their government specialists, as the latter takes a hand in organizing the former. Production plans will be consolidated at the zonal level by producers' delegates elected for that purpose, and will be aggregated and revised at the national level into the national Production and Livestock Production Plan. Local production targets may be adjusted between specific crops and commodities that are subject to national programming. Galvanizing the entire system will be allocations of credit and inputs according to approved farm production plans. This is a new system designed to replace the old extension system which operated before agrarian reform was implemented on a massive scale. It is also an attempt to inject a certain discipline and predictability into the national production

* See page iv for Glossary of Abbreviations.

system. Despite the obvious difficulties in implementation of such a comprehensive system, field observations reveal considerable progress. Hundreds of nuclei have been formed and Zonal personnel are reasonably satisfied with the support they have received to date.

c. D.G.I.'s basic research assets are its four Regional Research Centers (CRIAs) located in La Molina, Chiclayo, Tarapoto, and Arequipa. These have 14 experiment stations and 28 sub-stations. Professional employees, including agronomists, biologists, veterinarians, chemists, and economists total 248. There are 141 semi-professionals such as laboratory technicians and research librarians, 199 administrative personnel and 41 permanent service personnel, i.e., drivers, mechanics and electricians.

D.G.I. conducts on-going research programs in 18 specific crops, including soybeans and corn, and has contracts with other entities, including the National Agrarian University, for specific purposes, the most notable of which is corn research at the Cooperative Corn Research Program (PCIM). Selection and production of foundation seed is under D.G.I. auspices. Corn seed is being produced and distributed in cooperation with UNA in various sierra locations. Soybean foundation seed is produced at CRIA's I and II for distribution to commercial seed producers. With a \$7,400 AID technical support grant for soybean seed production D.G.I. has, in effect, established a revolving fund for future foundation seed. Demand for this seed among seed producers is substantial at present. Claims have been made on all existing seed as well as seed not yet harvested so that the existence of the fund seems guaranteed. The soybean seed production schedule in Annex B shows D.G.I. ahead of projected project requirements.

d. PCIM supports almost all of its operating costs from a royalty on hybrid corn seed sales. While its professional staff are members of various departments within the University and have their salaries and benefits derived from University funds, virtually all other costs of the program including travel and research costs, are covered by the seed royalty. The program maintains a germ plasm bank including 20,000 lines and has 2,500 varieties in cold storage. The agronomic characteristics of the various lines and varieties are computerized and a color photograph collection of germ plasm variability is nearing completion. The full use of these facilities will be beneficial to the Sierra corn program.

PCIM developed the improved corn now being recommended in the Sierra. Although it has operated for 21 years and has proven its worth by developing the coastal hybrids that have doubled Peruvian

corn production. PCIM has only within the last six years turned its attention to indigenous sierra varieties. Three researchers are engaged in the sierra corn improvement effort and PCIM personnel have conducted varietal trials and demonstrations in several locations.

e. EPSA is the semi-autonomous entity of MinFood primarily concerned with marketing and regulating supplies of important food commodities. It implements price policies by buying specified commodities at guaranteed prices and handling their transportation and distribution. Corn, rice, soybeans and many other commodities are so managed. In addition, EPSA manages the distribution of imported commodities and has its own wholesale and retail outlets. At present, the Director Superior of MinFood is also the Managing Director of EPSA, a fact which will aid in Marketing of soybeans. Warehouses and purchasing agents are maintained in all soybean production areas. Trucks are contracted by these agents to carry commodities from production zones to end-users. EPSA will also buy, clean, store, and sell official soybean seed using a differential price established by the Ministry.

f. The AgBank is by far the most important institutional lender in the agricultural sector, maintaining 87 branches, agencies or sub-units. These units are placed in all important agricultural areas where credit is used. Branches or agencies are located in every soybean production area of this project and in every corn production area as well.

With regard to soybeans, the Bank administers a special fund which is derived from a tax on vegetable oil and now amounts to S/. 120 million (\$2.67 million). This fund actually applies to all oil crops excluding cotton but will be used primarily for soybeans. Both production and investment in machinery and equipment can be financed through this fund, thus alleviating some of the pressure on long-term credit which applies to most other crops. No special credit facility is programmed for Sierra corn because it is primarily a home-financed crop.

g. I I A I (Agro-Industrial Research Institute) is a semi-autonomous arm of MinFood located at La Molina. It conducts market surveys, economic feasibility studies for food products and food technology research. It also helps set up pilot plants and has a capability to conduct laboratory tests of food quality, purity, and acceptability. I I A I staff is composed of competent food technologists and engineers numbering approximately 60, plus a complement of administrative personnel and laborers. It lacks certain equipment and some expertise needed for soybean processing tests and pilot activities. These minimal requirements will be provided by the Project.

D. SUMMARY FINDINGS

This food production project comes at a time when Peru is experiencing rapid increases in demand and serious deficits in domestic food supplies. On a positive note, the project capitalizes on the facts that much of the background research necessary for substantial increases in corn and soybean productivity is well advanced and a new Ministry has been given the mandate to institute new production systems.

Both corn and soybean production, as conceived by this project, represent tangible returns to farmers. In the case of soybeans, these gains are expressed as cash income from a second crop. Corn farmers will benefit by consuming most of their added production, freeing part of their meager cash income for other purposes. The net present worth of the soybean program is estimated at \$5.67 million, with estimated Benefit/Cost ratios ranging up to 1.56 (discounted 15%) and are enhanced by unquantifiable benefits from improved nutrition. Economic returns on investments in highland corn production are acceptable, particularly in view of the social nature of the goals. The Benefit cost ratio of 1.64 (discounted at 15%) indicates economic returns in excess of 15%.

GOP expenditures in support of this project will be substantial; \$4,346,000 for the four year period, not including credit. Annual amounts will not exceed one or two percent of the administering agency's budget, however. Since the MinAl is a new entity with the highest of priorities, food production, the MinFood is requesting the budgetary support required, with confidence that it will be provided. Moreover, MinFood has taken several steps to facilitate project implementation. These include establishment of soybean marketing channel and credit fund, as well as production of foundation seed sufficient to produce the official seed for 1977 target plantings of soybeans. Corn seed exists in quantities sufficient for 1976-77 seed production and MinFood employees are involved in collecting base-line data along with germ plasm from several zones. Selection of new employees and even trainees can proceed while the final budget is being prepared so that most elements can be placed soon after signing a Project Agreement.

The Project meets all applicable statutory criteria. (See Annex F, Statutory Checklist.)

E. PROJECT ISSUES

Issues raised in prior views of this project are stated in UNCLASSIFIED STATE 003356 which records the DAEC review of the PRP. Specific issues are listed below:

1. Target Group: A detailed description of beneficiaries was requested along with an estimate of the benefits to be received, with emphasis on aiding the poorest farm families possible.

Target groups are described in the Social Analysis, Section III, C. Benefits to be received by the target groups are estimated in part III, B, Financial Analysis.

2. Soybeans:

a. Acceptability of soy and soy products for human consumption in Peru.

This issue is treated in section III C., 2.

b. Price Policies - both as to production incentives and end-product costs.

This issue is discussed in Section III, B., 1., d., and 2.

c. Linkage between research and production, particularly the time required to bring improved varieties into production.

See Section III, A., 1., a., Research Technology.

d. Grades and standards and their application during and after the project.

See Section IV, B., 6., and 7.

e. Infrastructural Constraints to production in high jungle areas.

See Section IV, B., 4.

f. Marketing arrangements and how the project will assure that soybeans marketed will be of the quality necessary for economic processing.

See Section IV, B., 4., 6., and 7.

g. Can soybean production be economical without heavy mechanization?

See Section III, B., and Annex I.

- h. Credit availability
See Section IV, B., 1.
- i. Distribution of seeds, other inputs, and technical assistance.
See Sections IV, B., and IV, B., 2 and 3.

3. Corn

- a. Explain the alternatives for target group selection between optimal and marginal production areas.
See Section III, C., 3.
- b. Describe reasons for failure to increase highland corn production to date and the constraints which have limited distribution and use of improved varieties; how the project will address these constraints.
See Sections III, C., 3., and IV, C.

4. Nutritional conditions of the target group and expected impact of the project.
See Section III, C., 2., and 3.

5. How institutional coordination will effect the required level of services.
See Section IV, B.

6. Scheduling of long-term trainees and how trained personnel will be retained in the project.
See Section IV, B., 2., a., and Annex B.

7. Type and Scheduling of Technical Assistance.
See Annex B.

8. Role of Women
See Section III, C., 4.

9. Log Frame Revision
See Section II.

II. PROJECT BACKGROUND AND DETAILED DESCRIPTION

A. BACKGROUND (See Annex K)

B. PROJECT DEVELOPMENT

1. Integrated Soybean Development Plan (PIDES)

Late in 1974 the GOP sought USAID's assistance in analyzing the viability of soybean production in Peru and in developing a preliminary plan for such production. The Mission provided for 22 months of technical assistance for this effort under Project 060 through a Task Order with INTSOY. PIDES was produced by MinFood in mid 1975 as a preliminary evaluation of potential soybean production, with inputs from USAID staff and contractors and has been superseded by several subsequent INTSOY evaluations and field work by MinFood and USAID personnel. The substance of these evaluations appears in Section III of this document. In social, financial, and economic terms the conclusion is reached that soybeans have greater potential than other crops to produce financial returns to farmers when they are included in rotational systems, that returns to the economy will be substantial as compared to other possible investments, and that soybeans can provide nutritional benefits not now available to the poorest elements of the population.

2. Special Project for Development of Floury Corn

A preliminary estimate of the resources needed to increase the production of corn in the Sierra through the introduction of improved varieties was developed jointly by DGP, DGI, OSPAL and PCIM and had inputs from other entities in November 1975. The document overestimated the area that could be reached in the proposed four year time span of the Project and underestimated the number of personnel that would be needed. The corn program outlined in this PP is based on subsequent re-evaluations by the USAID staff in concert with PCIM and MinFood personnel. In summary, the conclusion of these evaluations is that the corn element should concentrate on the simple social goal of producing more food for consumption by sierra populations, starting with extension efforts in selected provinces of only two Departments in 1977 and expanding to five Departments by 1980 while conducting combinations of research and demonstration in eight Departments, depending on the level of seed improvement already achieved and the prevailing social and environmental conditions. This plan is largely the result of the expert judgement of Peruvian corn specialists backed by their broad knowledge of the area involved. The conclusion was reached that, by 1980, a 20-30% increase in corn production could be effected on 36,000 hectares of sierra corn land, benefitting roughly an equal number of farm families with new increments being added in succeeding years. This is based on much higher yield increases on experimental plots and on the fact that the corn will be produced on small farms of less than one hectare to five hectares, only part of which will be devoted to corn.

C. DETAILED DESCRIPTION

GOAL

The primary goal of the agricultural sector is to increase productivity, employment, and incomes and improve nutrition among the poor.

PURPOSE

The purpose of the Project is to achieve self-sustaining growth in the production and consumption of soybeans, improved corn, and soybean food products, thus increasing productivity and incomes among selected segments of the rural poor and increasing the national food supply while increasing the quality of foods commonly used by poor segments of the population, both rural and urban. By the end of the project, improved corn will be in use on 36,000 hectares of land in the Sierra, mostly on farms of less than five hectares. This will occur in selected Provinces of five Departments. In all eight Departments affected by the Project, research should have produced improved corn which can be disseminated to farmers with confidence that it will increase yields. Project locations have been selected according to the status of research accomplished or needed to achieve targets for each Province. (See Annex B for a detailed activity schedule.) A test of success will be the degree of demand for the improved varieties where they are available. Corn yields should have increased by at least 15% on the lands affected.

By the end of the project, soybeans products should be available for consumption as food in commercial quantities. The level of this consumption will depend, to some degree, on domestic production, which should have reached 54,000 MT (benefitting 10,000 farm families) as compared to the present production of less than 4,000 MT.

OUTPUTS

The most critical constraint in both soybean and corn production is now the absence of outreach capacity. Therefore, the output most emphasized is the formation of extension and research networks specialized for each product. The corn extension and research network will absorb 19 Professionals (Ingenieros Agrónomos) and 71 mid-level technicians while the soybean system will involve 17 Professionals and 42 mid-level technicians, both systems with clerical staffs and manual labor support.

Other Project outputs needed to achieve the Project purpose are:

1. Improved corn seed. Foundation seed now available will permit production of the 300 Metric Tons in one Department the first year. This will increase to 1300 MT in 1979 and fall to 1000 MT thereafter.

(The amount of seed production can be reduced as a program expands since improved seed will be maintained by farmers year after year, as in the traditional system.

2. Adapted Soy Varieties: Soybean varieties will be tested for the four major production areas within the research system using seeds from international germ plasm banks. At least one variety for each area should have been tested and proven. At the same time, plant breeding will have been started and a determination will be made in the last year of the project on whether to use only borrowed varieties or to continue breeding research to produce distinctly Peruvian strains.

3. Trained Technicians (See Annex B.)

4. Annual Corn and Soy Production Plans (See Annex B.)

5. Consumer-tested soy products. At least three soy-based products should have been produced by IIAI and tested for acceptability and quality in its laboratories and in limited market trials; these products will include bread, noodles and beverages.

INPUTS

AID's inputs include 155 months of technical services, 122 in soybeans and 33 in corn. Technical assistance is heavily weighted toward soybean production and research, reflecting the levels of expertise and experience existing in Peru--high for corn, low for soybeans. In soybeans this assistance will impact upon research, extension, selected production problems, economic evaluation, processing, and marketing. In corn, the assistance will serve a narrow range of research problems, centering on disease and frost resistance, soil fertility, and special problems, as they arise.

AID will also provide extension, research, and processing equipment. Fleshing out the extension and research network will require substantial purchases of vehicles which are beyond the GOP's capability in the near term. Research and extension equipment is also required. (See Annex B).

Training in soybean production, research, and marketing will also be sponsored by AID, again with more training in soybeans than in corn because of the divergent levels of need. An effort has been made to shorten the time required for training so that returning participants can contribute to the Project as soon as possible. However, the principal function of the trainees is to sustain the research and production effort after the project has ended.

A final AID input will be a minimum amount in support of in-country training, technical assistance contracts, and research costs stemming from the need to construct certain items of equipment in country and to acquire expendable equipment and supplies on short notice.

GOP

The major host country input will be the personnel required to build extension and research systems. A group of 60 professional and technical personnel will be recruited for soybeans; nearly all will have to be newly hired. For the corn program, 90 people will have to be recruited to meet projected needs for 1980. For details see Section Annex B, Budget Analysis - (GOP).

In addition, MinFood will budget for local support costs, clerical staffs, office supplies, vehicle operation and maintenance, and unskilled labor. Existing research and extension facilities will be employed and the Ministry will provide a corn seed fund at a total cost of \$ 376,000, while maintaining an extant revolving fund for soybean seed. Credit for soybean production should amount to \$ 17.6 million by 1980. This will be furnished through a special arrangement whereby taxes on vegetable oil are provided to the AgBank specifically for this purpose. This arrangement is now functional in Bagua and Tingo Maria.

Assumptions

The staffing levels established for this Project reflect the best area-by-area judgement of project coordinators and consultants made during field visits in March and April. The present lack of outreach capability has been identified as the key constraint and the large number of personnel to be hired is intended to deal with the problem. The critical assumptions at the output level are that (a) the priority of corn and soybeans will remain high and that (b) MinFood will receive the budgetary support for the additional staff required for promotion of both crops.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY TO to FY 80
Total U. S. Funding \$1,968,000.
Date Prepared: 8-11-76

Project Title & Number: Corn and Soy Production on Small Farms

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <p>Increase productivity, employment and income and improve nutrition among the poor.</p>	<p>Measures of Goal Achievement:</p> <p>% Increase in farm productivity in affected zones.</p> <p>% Population with access to more or better food supplies as a result of the project.</p>	<p>Project data and field survey.</p>	<p>Assumptions for achieving goal targets:</p> <p>Corn and soy productivity not offset by losses in other crops or limited ability to import other vital commodities.</p>
<p>Project Purpose:</p> <p>Achieve increased consumption of corn and soy fortified food products by the poor.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <p>Per capita corn consumption increased by at least 15% in project zones. At least 10,000 MT soy being consumed as food.</p>	<p>Ministry and Project Data and Records</p>	<p>Assumptions for achieving purpose:</p> <p>Price relationships remain in relative balance. Soy grades & standards adequate for processing needs.</p>
<p>Establish soybean production on 34,000 hectares of high jungle land, and raise planting of improved highland corn seed to 36,000 hectares by 1980</p>	<p>Up to 10,000 farmers, using soy as a rotational crop, are producing 54,000 MT of soybeans per year. 36,000 highland farmers, using improved seed, increase corn yields 15-30% on plots averaging one hectare.</p>	<p>Ministry, EPSA, and Project Data and Records.</p>	<p>No unusually severe weather conditions or other natural disasters. Corn technicians can adapt new varieties to varying conditions without long-term U.S. T.A.</p>
<p>Outputs:</p> <ol style="list-style-type: none"> Expanded corn R/E network. Expanded soy R/E network. Improved corn seed and soybean seed. Adapted soy varieties. Trained technicians. Annual corn and soy production plans. Consumer-tested soy products. 	<p>Magnitude of Outputs:</p> <ol style="list-style-type: none"> 19 Agronomists and 71 technicians by 1980. 17 Agronomists, 43 tech. by 1980. 1,300 MT by 1979 (corn) 750 Tons by 1978 (soy) For four major production areas. See Section III, E., and Annex B. Three. Bread, noodles, beverages. 	<p>Program monitoring.</p> <p>Project records/contractor evaluation.</p> <p>AID training records.</p> <p>IIAI records & contractor evaluation.</p>	<p>Assumptions for achieving outputs:</p> <p>Continued policy support and budget allocations for corn and soy as priority crops.</p>
<p>Inputs:</p> <p><u>USAID</u></p> <p>U.S. Technical Assistance Contract. Research, Extension & Processing Equip. Training Funds. Local Costs.</p> <p><u>GOP</u></p> <p>148 Counterpart tech. + support staff. Local support costs. Research/Extension facilities Credit Seed Fund.</p>	<p>Implementation Target (Type and Quantity)</p> <p><u>USAID</u></p> <p>122 months services soybeans; corn 33. Cost: 965,000 Total equipment 496,000 Soybean participants 309,000 Corn Participants 119,000 Local Support 83,000 1,972,000</p> <p><u>GOP</u></p> <p>36 Agronomists and 114 technicians. \$1,800,000 support costs + labor Seed \$376,000 Credit \$ 35.0 million over 4 years.</p>	<p>AID and Contractor reports AID training records Procurement records. MinAl and PCIM records. AgBank reports.</p>	<p>Assumptions for providing inputs:</p> <p>Qualified experts available. Qualified participants.</p>

III. PROJECT ANALYSES

A. Technical Analysis and Environmental Assessment

1. Appropriateness of Time and Place

a. Soybeans

Timing

The GOP, with AID support, is mounting a soybean production effort at a time when the agrarian reform process is nearing completion and domestic production, particularly of traditional staples and protein-rich foods, has undergone a decline in volume or, at best, a relative decline in per-capita terms. Between 1970 and 1974 food grain (rice, barley and wheat) production dropped 14% from 874,200 MT to 751,000 MT. In the same period feed grain production fell 2%. Grain-based animal protein production rose only 3% (thus declining in per-capita availability) as heavy importation of grain was permitted to stimulate the poultry industry. Gains in poultry were offset by beef production which fell 24% and milk production which declined slightly.

The total value of imports of feed and foodstuffs rose from \$150 million in 1971 to \$357 million in 1974. The significant factor promoting this increase was feed grain. With population growth at 3% per year, production of dietary staples declining or, at best, remaining steady, and production of animal protein declining in per-capita availability, the poorest elements of the population--those in rural areas on the fringes of the monetary economy and those in the slums of the larger cities--have had progressively less access to reasonably priced, high quality food.

This Project is a direct result of the recognition of the need to attack the problem of food scarcity and food quality by mobilizing Peruvian resources to produce, process, and market soybeans which offer high quality protein in a wide range of sub-products and which can be sold within reach of the poor in the form of enriched flour for noodles and bread, and eventually as meat and milk substitutes.

Vegetable oil is a deficit commodity in Peru -- a fact which has led to Peru's pioneering the use of mixed fish and vegetable oils to produce cooking oils and margarine. The demand for cooking oil is about 168,000 MT/year of which vegetable oils make up only about 100,000 MT, mostly from imports. Fish oil accounts

for the remaining 68,000 MT. But fish oils are only minimally satisfactory and supplies are becoming less and less certain because of fluctuations in the annual fish catch. Peru has begun an African oil palm project which could eventually supply 20,000 MT of edible oils. However, by the time that amount is reached, demand will have increased at least as much. The substantial soybean production expected to result from this Project can be counted upon for a valuable contribution in edible oils.

Soybeans are, and will continue to be, an ingredient in livestock feeds. More than half of such ingredients for commercial poultry and pork production are now imported and any contribution that may be made through domestic production can be of great value both in foreign exchange savings and in livestock production. This use of soybeans can be made while increasingly greater amounts of soybeans are channeled toward direct human consumption because production will rise as the Project continues.

The Project is timed to reach major soybean production zones in the high jungle at a time when major trunk roads will have been completed to permit commerce. Transportation to and from Tarapoto and Juanjuí (in the major potential production zone) is now accomplished primarily by air, although a land route employing ferries is also open. However, the AID sponsored Tarapoto highway is scheduled for completion in late 1977 or early 1978 and soybeans could then become a major stimulus to farming in those zones which together have about 80,000 ha. suitable for soybean production in crop rotation systems.

Technology

The soybean production technology selected for support by this project represents a set of practices which is suitable for the non-mechanized, tropical farm of less than five hectares where labor comes primarily from family sources. Project-sponsored mechanization will be held to the minimum necessary for research and demonstration functions. Machinery will be of the type developed for small farms or collections of small farms. Large tractors, self-propelled combines and related equipment suitable for extensive farming operations will not be financed. Small stationary threshers and dryers, small seeders and tractors may be financed by the AgBank which has a special fund to finance soybean production and has developed a plan for its use. This fund stands now at \$2.67 million, is growing steadily from secure revenues, and will eventually finance production as well as capital investments in machinery.

Research Methodology

The soybean research sponsored by the project will broaden current GOP efforts in varietal testing, fertilization, ro-

tation systems and plant populations. It will also lay the groundwork for the development of new varieties for Peru through in-country plant breeding. Varietal and related testing is intended to produce short term results. Plant breeding normally delivers results in eight to ten years. With new tropical varieties being added to the world collection in other countries, Peru may well be able to borrow varieties rather than produce its own. This is a trade-off that will be examined as research progresses. Some Peruvian technicians and limited numbers of farmers already have experience with certain varieties. CRIA II at Chiclayo keeps a soybean germ-plasm bank to which will be added varieties for testing and breeding in research and demonstration facilities appropriately located for these purposes in production zones.

b. Corn

Timing

The sierra is Peru's most neglected zone. The major crops of the sierra, wheat, barley, potatoes and corn, are grown mainly for home consumption. Of these major crops, corn is the one that has received least attention in research and production campaigns. By 1970 the volume of production of the other major crops had reached a plateau beyond which yields could reasonably be expected to increase only slightly as shown by the following comparison:

	1 9 7 0		1 9 7 4	
	Production / 000 MT	Area 000 Ha.	Production / 000 MT	Area 000 Ha.
Wheat	136.7	137.9	147	150
Barley	159	180	168	188
Potatoes	1,896.3	295.9	1,990	315

In corn production, past emphasis was placed on hard yellow varieties for animal feed and a modern corn and livestock industry was established. Yields were nearly doubled in the ten years preceeding 1970 and have remained steady since. Sierra corn received attention only at the margins of research, and never in a way that integrated research and extension.

Under the new production system the MinFood, the floury corn (maiz amilaceo) of the sierra has been named, for the

first time, a priority crop for national programming. As such, it will receive the emphasis required to increase its production. The rationale for the designation is threefold: (1) sierra corn is a common and popular consumption item of importance in the diet of people of highland origin; (2) the basic research on its improvement has been accomplished and ; (3) improving yields and quality can produce significant income and dietary improvement through more home consumption and, eventually, greater market availability.

The corn program comes at a times when Peru is searching for calorie and protein sources for its poorest people and when other crop production efforts have leveled out. It promotes corn as a crop which is both widely familiar and subject to improvement in the near term through the application of reliable research accomplishments and methodologies.

Research Technology

In each major sierra corn production zone there are traditional varieties which have qualities that are familiar to, and demanded by, the farmers and consumers of the zone. Over the last decade, PCIM plant breeders have collected samples of these varieties and have planted them side-by-side in the same fields, allowing cross-pollination. By mass selection, i.e., selecting the seed from plants showing improved characteristics such as larger ears, greater number of ears, and resistance to adverse environmental conditions, and back-crossing, seed has been developed to produce higher yields of familiar varieties under harsh mountain conditions. The seed is available in sufficient quantities to initiate demonstration and propagation.

Extension Methodology

An integrated research and extension network, made up primarily of technicians native to the production zones, working under contract with PCIM, will be the vehicle for dissemination and promotion of improved seed, the only input required for the initial shift to improved varieties. Within the network, which will also include MinFood employees, research, seed production, demonstration and finally extension will be conducted by the same people, thus assuring continuity in contact with farmers and depth of experience in extension agents. This methodology is particularly well suited to the uncomplicated research which is required and to the constant contact needed between farmer and extensionist.

Production Technology

The corn program will be directed primarily toward small farms where investments in modern inputs are rarely made,

indeed where such investments are possibly too costly given the inherent risks of drought, frost and hail. The production methodology will be traditional. Tillage will be by human or animal power. Seeding will be done by hand. Manure, used sparingly, will be the principal fertilizer and harvesting will be a manual process. Once the farmers have accepted improved seed, they will be encouraged to continue the seed selection process, using a methodology similar to their own but following criteria recommended by extensionists. Yield increases of from 15% to 30% are projected for this level of technology, even though test plots show far greater increases, as in Table 3-A. The conservative projected increase is judgemental, based on researchers' observations of traditional practices. The data are representative of general responses in the sierra.

Table 3-A: Yield Results of Improved Varieties with and Without Fertilizer in Cajamarca (1973)**

	Yield (Kilos/Hectares)	
	With Fertilizer	Without Fertilizer
PMC - 561*	3,874	1,394
Negro Parubamba*	3,624	1,601
Azul Cancha*	3,392	1,395
Sangre Toro*	3,194	1,392
Control (Unimproved)	1,760	496

* Improved varieties

** These tests were made on "new plots" in the sense that the land did not have a history of experiments involving fertilization.

Source: Ricardo Sevilla, "Selección de Variedades de Maíz para zonas de alto riesgo en presencia y ausencia de Fertilización." IX Reunión de la Asociación Latinoamericana de Fitotécnica, Panamá, Marzo 1974.

2. Environmental Considerations

Since the crop production programs contemplated by this Project involve no departures from standard or recommended agricultural practices they are neutral as to the environment. No increases in quantity, or changes of types of fertilizers, herbicides, pesticides or other chemical agents are contemplated. Soybeans may reduce slightly the overall quantity of Nitrogen fertilizers needed for other crops.

The progressive settlement of the jungle is a current phenomenon which the introduction of a cash crop such as soybeans may well help accelerate. However, the positive and negative factors associated with this movement cannot be quantified, either as regards the high jungle itself or the areas from which the population comes. It is doubtful on the one hand, for example, that the pace of settlement would accelerate to the point that the sierra would begin to lose population in real terms. Even if this came to pass, the sierra would have to lose a significant number of people before environmental conditions could improve, before erosion could be slowed and pastures could begin to recuperate. On the other hand, it could be claimed that soybeans will tend to eliminate the wasteful slash and burn style of agriculture in some areas where they are introduced by encouraging farmers to tend their cleared land more intensively and providing a means to retain or augment soil fertility by fixing nitrogen. However, the extent and impact cannot be quantified in environmental terms.

B. Financial Analysis

1. Financial Rate of Return to Soybean Farmers

a. Methodology

The calculations in this analysis are based on the most recent cost-of-production estimates of the DGP in the major potential soybean production zones and on EPSA guaranteed prices for commodities. Crop yields are based on DGP estimates confirmed through informal conversations with farmers in the zones.

Though the legal current wage is assigned to labor, an assumption is made that family labor is sufficient to produce the crops involved in the analysis. DGP cost-of-production estimates do stipulate a value for labor as a cost but this value is included in net returns i.e., the farm family pays itself for its own work during the crop season and this wage becomes part of the net return to the family. Thus labor has zero cost to the enterprise. Likewise, land has no direct cost. It has no market value and is not taxed, whether owned or held without title.

Selection of crops for comparison in the analysis was accomplished by identifying the major crops of the zones and selecting those for which either AgBank credit or markets existed. Specialty crops with very thin markets were excluded. These include highly perishable vegetables and most varieties of beans.

b. Conclusions of the Financial Analysis: Soybean Production

The analysis deals with areas in which continuous cropping is possible and is practiced by the more progressive farmers but where second crops have been limited by disease and the small number of alternative cash crops that could be planted in a rotation system. These constitute the major production zones. Details of the analysis appear in ANNEX I.

As a short season crop with high cash returns per unit of production and a guaranteed market, soybeans offer a competitive possibility for the farm enterprise in both zones analyzed, even though volumetric yields per hectare are not as high as for other crops. In Zone IX, which encompasses Tarapoto, Juanjuí, Aucayacu and Tingo Maria, where all crop yields are generally lower, soybeans are the most profitable crop with a reliable market. In Zone II (which includes Bagua), where rice yields are high but the second rice crop is limited, soybeans offer the most profitable choice among rotational crops.

The financial analysis attempted neither to predict nor to evaluate the impact of yield increases that may be expected to result from the spread of soybean production technology as farmers gain experience and the best adapted varieties are selected for each region. DGP technicians expect the average yield to increase at 50 kg/ha/year until the national average hits 1,650 kg/ha in 1980. This seems a modest goal in view of research results for several varieties averaging 2,369 kg/ha and ranging as high as 3,160 kg/ha.

Another tangential benefit of soybean production has been left out of the equation because there is no country-specific research on the value of residual nitrogen remaining in the soil after a soybean crop in reducing production costs for succeeding crops.

As noted in a recent report:

"Not all the nitrogen fixed by legumes finds its way into their grain;..... If the plant residues are returned to the soil,-- they supplement the fixed nitrogen of the roots in building up soil

nitrogen.... it is well established that if legumes are planted in rotation with cereals, this nitrogen can substantially benefit the cereal yields...." 1/

Under average conditons in the cornbelt of the United States soybeans leave residual nitrogen amounting to 50 to 55 kg/ha. Under jungle conditions this residual would dissipate more rapidly than in temperate climates but it would also be utilized more quickly. The value of this nitrogen is S/.28 to S/.36/kg (= \$.56 - \$.72) or S/.1,600 to 1,800/ha. (= \$35.56 to \$40.00/ha), adding about 10% to the net returns on soybeans.

The value of soybeans in reducing disease problems in other crops by preventing build-up of pathogens and insect populations has not been calculated. In Bagua, however, the disease build-up in continuous multiple cropping of rice led to prohibition of successive rice crops, dictating a rotation system wherein rice will be planted only once a year. Soybeans therefore have a value to the farmer over and above their value as an income earner.

2. Financial Analysis: Soybean Processing and Marketing

By Ministerial Resolution, the Minister of Food has arranged for EPSA to handle or manage directly the marketing of oil crops (except cotton seed) the foremost of which is soybeans. For this purpose, EPSA has 15 collection and storage points. All prospective production zones have such facilities, usually consisting of a dry warehouse of about 800 MT capacity.

In addition, privately owned oil processing plants are required to serve as collection points receiving all proferred soybeans that may be brought to them by domestic producers. Their locations and processing capacities appear below:

1/
P.J. Dart, Development Digest, Vol. XIII No. 4, October 1975, page 21.

<u>Company</u>	<u>Location</u>	<u>Processing</u>	
		<u>Capacity (MT/day)</u> <u>Cotton</u>	<u>Soy</u>
Compañía Oleaginosa del Peru S.A. (COPSA)	Sullana	153	92
Sindicato de Inversiones Industriales S.A.	Piura	50	30
Calixto Romero S.A.	Piura	75	45
Industrias Pacocha S.A.	Huacho	120	72
COPSA	Callao	237	142
Compañía Industrial Peru Pacifica S.A.	Lima	200	120
Oleaficio Lima S.A.	Lima	46	28
Compañía Industrial La Union S.A.	Cañete	61	37
Fabrica de Aceite La Pisqueña S.A.	Pisco	70	42
TOTAL:		1,067	521

Operating 300 days a year these extraction plants can process 323,760 MT of cotton seed or 191,066 MT of soybeans, both amounts far in excess of availabilities of domestically produced oilseeds. Annual cottonseed production stands at about 145,000 MT and production of other oilseeds is negligible.

The high incentive price paid to farmers represents a direct subsidy because, through a certificate payment arrangement, EPSA collects only S/.8,556.54/MT (= \$180) from processors. This is the equivalent of \$5.20/bu or about equal to the present CIF price of imported soybeans in Lima.

Soy-Fortified Flour

The price of imported U.S. soybean flour CIF Lima is about \$350/MT, but Peruvian mills probably could not meet this price since they would be operating at low volumes and with little experience. Therefore a higher price (\$425/MT) is assigned for purposes of this analysis. This includes a milling margin for profit to the miller.

Improved wheat arrives in Lima at about \$220/MT CIF and sold to mills at a subsidized \$140.00. When milled into flour, the cost to the baker is \$191.80.

One MT of soy fortified flour consists of 88% wheat flour and 12% soy flour. It would cost the baker \$219.74 ($= .88 \times 191.8 + .12 \times 425$), 14% more than wheat flour. This additional cost is reduced to 8% by the fact that soy fortified flour makes 6% more bread than straight wheat flour, and would disappear if there were no subsidy on wheat, i.e., if millers and bakers paid the full import costs.

In the price of a loaf of bread, flour represents only 58% of overall costs. The formula used to represent the total cost of bread is then (Flour price \times 58% + total other cost \times 42%). A loaf of bread weighing one Kg. now costs about S/.24 = \$.50 of this 42% or \$.21 is fixed. The flour cost accounts for 58% or \$.29. This cost would increase by 8% or about \$.02. A loaf of soy fortified bread would then cost \$.52 or four percent more than ordinary bread. Though bakers may resist even this modest increase, EPSA, which controls the distribution of flour, could enforce acceptance by official regulation or it could simply provide an incentive by either raising the price of wheat or lowering the price of soy flour.

Bread from 12% SFF will have 50% more protein than ordinary bread and this protein, because of the presence of lysine and tryptophan, two essential amino acids present in soybeans, will have a Protein Efficiency Rating (PER) of 1.9 as compared to .7 for ordinary wheat flour bread. SFF breads retain traditional qualities and characteristics of wheat flour breads and are baked in the same manner. USAID/FFP feeding programs in Peru are now using SFF breads and noodles made to order by five Peruvian enterprises. Their acceptance is universal. Noodles can be fortified at roughly the same cost and the same nutritional advantages with the additional benefit of a longer shelf-life than bread.

Soy milk, of the type developed by Mustakes at the University of Illinois, is of considerable interest to Peru as its milk production has declined and increasing quantities of powdered milk have been imported. The process was developed when soybeans cost \$2.70/bu and the resulting dry soy milk base could be produced for \$.096/lb. since the subsidized price to Peruvian processors will be \$5.20/bu the dry base cost will be $.096 \times \frac{5.20}{2.70} = \$.19/\text{lb}$. Proc-

essing and other ingredient costs may push this price toward \$30/lb. One pound of dry base will make nine pounds (over one gallon) of 3.6% protein soy beverage which can substitute for, or be mixed with

fresh and reconstituted milk. The price of reconstituted milk in Lima is S/.13 per liter or about \$.27. The soy beverage price could be placed anywhere between \$.08 and \$.27 and be fully competitive. Small amounts of soy beverage are made by refreshment vendors in their establishments and sold in various towns of Peru, including Bagua and Tingo Maria. Nothing is known of the process used but "refresco de soya" is locally popular and apparently profitable.

C. Social Analysis

1. Soybean Producers

The vast majority of the 10,000 potential soybean producers who will benefit directly from this project are located in recently settled areas of the high jungle in the Huallaga Central north of Tingo Maria and Bajo Mayo between Juanjui and Tarapoto, primarily in the Department of San Martin. These areas are gaining population at an annual rate of 10.35% of which 7.55% is from immigration. The Sierra has provided 55% of these newcomers and 14% have entered from the coast. In the latter category are included some who first migrated from the sierra to the coast, thence to the jungle areas.

Some 4,000 immigrant families were settled under an IDB/GOP colonization project but these families represent only about 10% of the total population of the Tingo Maria, Tocache, Campanilla area. Multi-family settlements proved unworkable in this zone and 30% of the individual parcels were abandoned by dissatisfied recipients who selected other locations in the same area. Many of the abandoned parcels were reclaimed by families not associated with the colonization scheme.

The "Diagnostico Socio-Economico de la Colonización Tingo Maria Tochache Campanilla" done by CENCIRA in 1974 notes that the amount of land occupied by the majority of immigrants in that zone does not surpass five hectares. This amount of land, occupied by one family prevails, around Tarapoto and Juanjui as well as in Bagua. The Diagnostico also notes that subsistence agriculture prevails throughout the zone. Corn is the principal crop during the period just after settlement. When some degree of stability is achieved, the family begins to plant commercial crops such as rice and plantains.

According to the Diagnostico a system of labor called "chova-chova" is commonly used. This is simply trading labor between families according to need and it allows concentration of effort at peak seasons e.g., planting and harvesting.

An average family in the jungle area includes 5.4. people. Family incomes, based wholly on farming are in the intermediate range of agricultural incomes country-wide; they are lower than coastal incomes and higher than those of the sierra. Sub-family sized farms i.e., 5 hectares or less constitute 56% of the farms of the area, the vast majority of which have been created through spontaneous settlement of immigrants. Based on informal discussions with farmers and technicians in Tingo Maria, Aucayacu, Tocache, and Tarapoto the basic farming pattern includes only one or two cash crops per year on a portion of the land and a mixture of home consumption crops such as peanuts, sweet potatoes, vegetables, and corn, often inter-planted and growing year-round. The latter are destined both for human and animal consumption. The result is a minimal income achieved at irregular intervals as cash is required for the purchase consumer commodities and farm produce is sold to obtain them. Annual incomes are judged to be \$200-300 per-capita, much lower than in the rural coast, but higher than in the Sierra.

The province of San Martin contains most of the land that will eventually produce soybeans. Of the 4,683,167 jungle hectares of the province somewhat more than 101,117 hectares are under some sort of cultivation. Land devoted to annual crops totals about 50,000 hectares, of which only 650 are irrigated. The remaining land is in permanent crops, pastures, woods and wasteland.

In the 1973 census, this land accounted for 40% of the total land includes the "Oriental" classification. Assigning the same percentage with regard to farm size data from the census, the following land distribution pattern emerges:

Table 3-B: Land Distribution *

Unit Size (ha.)	No. Units	Area (ha.)	Aver.Size (ha.)
Less than 1	984	528	.54
1 to less than 5	10,408	21,817	2.1
5 to less than 500	9,096	167,638	18.4
500 or more	<u>26</u>	<u>68,474</u>	2,633.0
TOTAL	20,514	238,827	

* Includes waste land.

The majority of these units are held without formal title by individual families. In the group with less than one hectare 78% are squatters; in the 1-5 hectare category 86%; and in the larger groups 84%.

Land use patterns show an inverse relationship between the size of the unit and the percentage of land devoted to annual crops:

Table 3-C: Annual Crop Area by Farm Size*

Unit Size (Ha.)	Total Area	% Annual Crop Land	Cropped Area
Less than 1	528	86	454
1 to less than 5	21,817	78	17,017
5 to less than 500	167,638	19	31,851
500 +	68,474	1	685
TOTAL:	238,827		50,007

It should be noted that in the farm categories 5-500 hectares and larger than 500 hectares, 58% and 83% of the land, respectively, is classified as mountains and woods. This accounts for the low levels of cultivated land in those groups.

A 1971 estimate indicated that only 6,150 hectares of land in San Martin is doubled-cropped. This represents an increase of 5,000 hectares from 1969 and, although no more recent data are available, permits a current estimate of about 10,000 hectares, i.e., only one fifth of the land in annual crops produces two crops per year. Climatic conditions give farmers a high degree of flexibility in planning cropping patterns.

The Project will permit double cropping to expand more rapidly through the introduction of soybeans which have a guaranteed market and ready credit. The agronomic complementarity of soybeans in rotation or interplanted with cereal grains, together with their price has made them attractive to farmers of the region. As more land is cleared by the burgeoning population, soybeans will not only help increase

* Source: 1972 National Agricultural Census

annual productivity but may contribute to stabilization of farming patterns by eliminating some of the need for fallowing or abandoning land after four or five crop seasons. Farm incomes can be expected to increase as indicated in the financial analysis with actual gains dependent upon farm size. Adding a soybean crop to one corn or rice crop will increase farm income by more than 100%. Substituting soybeans for either a second rice or corn crop will yield about 30% more income in San Martin.

Adding a second crop to the farming pattern in San Martin can be expected to have important employment effects. Each hectare of soybeans requires 43 man days of labor under traditional systems. Though this could be reduced over time through investments in small machinery the addition of 15,000 x 43 = 645,000 days of available employment, which is equivalent to 2,150 full time jobs, can be expected during the Project. Whether taken by family members or day laborers, net income generated by this labor would be roughly S/.13,494/Ha. x 15,000 = S/.202,410,000 of added purchasing power. The targeted soybean area of the Project in San Martin is 15,000 hectares, but this could be surpassed in future years when the main road from the north coast to Tarapoto is completed, linking up with Juanjuí which lies in the center of a zone with the potential to produce 80,000 hectares of crops, including soybeans. See Annex B, page 13, for a listing of soybean production targets by location and year.

2. Soybean Consumers

Peru has a history of malnutrition. In 1960 it trailed all other South American countries in per-capita consumption of calories and proteins. Average calorie intake was under 2,000 a day and protein consumption was 20% less than recommended levels, at 53 grams. This picture had improved by 1964 when 2,250 calories and 58 grams of protein were recorded. It continued to improve slowly until the late 60's, but since 1970 agricultural production increases have been disappointing and population growth has continued unabated. Only through increased imports have food availabilities remained near 1970 levels. Food prices have advanced at alarming rate, as shown by the consumer price index below:

Table 3-D: Retail Consumer Price Increases 1974 - 1976 *

Commodity	% Increase 1974 - 75	% Increase 1975 - 76	Total % Increase 1974- 76 (Compounded)
Vegetable Oil	39	25	73.75
Blended Oil	20	17	40.40
Poultry	13	45	63.85
Potatoes (white)	30	29	67.70
Beef	40	17	63.80
Milk (fresh)	15	25	41.45
Rice	25	24	42.50
Bread	43	15	64.45
Spaghetti	20	18	41.60
Sugar (white)	27	42	80.34

Food acquisition absorbs fully half of the average family expenditures country-wide, varying from a low of 38.9% in Lima, where incomes are highest to 63.3% in rural areas, where they are lowest. These expenditures are detailed below:

Table 3-E: Food ---% Expenditures from Family Budgets **

	Peru	Lima	Large Cities	Pop. Centers	Rural	Coast	Sierra	Jungle
Total	50.3	38.9	49.2	54.5	63.3	54.1	61.1	54.8
Purchases	38.8	38.9	47.6	48.5	30.2	51.2	30.3	32.5
Home Pro- duced	11.5	-.-	1.6	6.0	33.1	3.9	30.8	22.3

* Source: FAS Agricultural Situation Reports for Peru 1975 and 1976.

**Source: Analisis de la Estructura de Gasto Familiar, Ministerio de Economia y Finanzas, Encuesta Nacional de Consumo de Alimentos (ENCA).

Table 3-F: Distribution of Food Expenditures in Percentages

Classification	Peru	Lima	Large Cities	Pop. Centers	Rural	Coast	Mountain	Jungle
Tubers & roots	31.2	14.2	18.1	23.3	45.2	14.3	43.6	52.1
Cereals & derivatives	23.5	21.9	24.0	24.6	23.8	25.8	25.6	13.6
Milk & Derivat.	7.6	14.1	11.2	8.2	3.4	10.1	4.2	2.1
Meats, Fish, eggs	7.5	12.1	13.2	11.2	5.5	12.0	4.9	11.7
All other	29.3	37.7	33.5	32.7	22.1	37.8	21.7	20.5

The data for Lima and other large cities is highly skewed by the fact that in these places dwell the most of the upper and middle income groups who are engaged in government, business, military services, and the professions. They are the educated group and constitute the top strata of incomes. As such they are the group consuming more protein from animal sources and less from tubers and cereals. ENCA data bear this out by showing in the lowest income strata of Lima (incomes under S/.15,000 per capita = \$333) families consume 593 Kg. of cereals and cereal products while in the top strata (incomes over S/.34,500 = \$766.66) only 378 Kg. are consumed. There is a notable difference in meat consumption between income strata with stratum I consuming 153 Kg. per year or 23.18 Kg. per person and stratum III consuming 215 Kg. or Kg. 48.86 per person per year. With the exception of fish, the consumption of which is low and about equal between strata, other high quality protein sources follow the skewed distribution. It should be noted that the lowest income group in Lima expends 60% of its current income on food.

While this Project does not contemplate attempting to confine the benefits of soybeans and soybean products specifically to low income groups, the nature of these products is such that they will tend to be consumed in greater quantities by the poor in bread and noodles which are consumed in large quantities by those groups because of their low costs and general availability.

Food Composition Tables provide the following data on nutritive values of 100 grams of wheat breads:

<u>Food Energy</u> (Calories)	<u>Protein</u> (grams)	<u>Fat</u> (grams)	<u>Carbohydrate</u> (grams)
290	9.1	3.0	55.4

Adding 12% defatted soy flour (containing 47% protein) to wheat breads will double the crude protein content and triple the utility of those proteins without changing other values appreciably. Moreover, essential vitamins and minerals are increased dramatically --calcium 227%, potassium 211%, iron 76%, thiamine 371.70%.

This difference will be especially meaningful to pregnant and lactating mothers and to growing children who require more calories and protein per unit of body weight than ordinary adults as shown by the data extracted from the National Academy of Sciences Food and Nutrition Board's Publication:

Table 3-G: Comparative Nutritional Requirements

Age/Category (Years)	Weight Kg.	Calory Requirement	Protein	Requirement		
				Cal.	Prot.	
1/2 - 1	Nursing	9	Kg. x 100	Kg. x 1.8	100.0 x kg.	1.8 x kg.
2 - 3	Weaned	14	1250	25	89.2	1.6
22-35	Adult Male	70	2600	69	37.1	0.9
22-35	Adult Female	58	2000	55	34.3	0.9
22-35	Pregnant "	58	2200	65	37.9	1.1
22-35	Lactating Moth.	58	3200	75	55.1	1.46

For a weaned child 2-3 years old, 100 grams of SFF bread or noodles could supply most of the protein requirement. Pregnant and lactating women could likewise supply themselves with most of their protein requirements from such products though the quantities required would be greater. Further, since bread and noodles are those most commonly purchased items in the poorer households, and since there is no perceptible taste or textural difference between fortified and non-fortified cereal products, the poor will benefit in greater proportion than other groups.

3. Financial and Social Analysis - Corn Production

This element of the project addresses the problems of a portion of the poorest families of Peru -- the Andean farmers who make up 40.4% of farm families and receive 16% of the national income.

Table 3 - II: Socio-Economic Characteristics of the Rural Family in Peru, 1972

	National	Rural Sierra		
		North	Central	South
Average Annual Family Income S/.	53,900	21,500	29,000	14,900
Percent of National Income	100	6.0	6.3	3.7
Number of Families	2,136,812	321,300	251,000	289,976
Percent of Families	100	15.0	11.8	13.6
Average Family Size	5.7	5.7	5.2	4.7*
Percent home-produced food contributes to family food budget	32.3	55.2	56.2	78.4

Source: "A Socio-Economic Diagnosis of the Peruvian Small Farm Sector", Dr. A. Eugene Havens et.al., Lima, April 1976.

* The markedly lower family size may be due to more rapid out-migration as a result of lower per-capita incomes.

Within these depressed areas, the most depressed income groups are represented by the categories five hectares and under. The small farmer averages about one hectare of land fragmented into three or four plots. He devotes some of his annual crop production to corn and produces this crop with his own and his family's labor, without irrigation, with animal power being his major source of energy, with no use of official credit, with little technical assistance, and with almost no fertilizer, and

from seed that he reserves from the past year's crop. He does this work on a diet that is deficient in calories and protein. With traditional varieties he produces from 400 to 900 kilos of corn per hectare. The data tables for the financial and social analysis of corn producers appearing in Annex I provide detailed socio-economic and nutritional indicators, selected elements of which are summarized below:

Farm Size: In the sierra an extremely high percentage of farm units are classified as minifundia, sub-economic units insufficient to maintain a family. In Ancash, the Department where corn extension work is first scheduled, 41.7% of all farm units are less than one hectare and 89.2% are below five hectares. Only 12.8% of the land is contained in these units. Corn is planted on 36.5% of the crop land farmed each year in the farm size categories below five hectares.

Nutrition: The sierra diet is characterized by dependence on tubers and cereals, heavily weighted toward calories (even though some estimates indicate calorie deficiency) and low in protein. This diet is mostly home-produced. Overall, 61.1% of all food consumed in the sierra is home-grown. Since this includes urban areas, the rural sierra produces a much higher percentage of its own food. Corn, more than any other food, is produced by the same family that consumes it. In the central sierra 75% of all dry corn and 93% of green corn falls in this category. The figures are 86% and 89% for the northern sierra; 80% and 83% in the south. In the rural sierra diet, this home-produced corn provides between 9.7 and 16.6% of the calories, and between 8.3 and 15.4% of the protein, no bargain considering that 36% of the farm land is devoted to corn. The impact of both raising yields and increasing protein quality and content is clear. High lysine corn can double protein values and raising yields can increase caloric intake.

Cultural Practices: Labor on small farms comes either from the farm family or from trading labor between farms, i.e., part-time labor is paid mostly in kind and virtually no full-time laborers are employed. Virtually no small farms use mechanical power; nearly all depend on human and animal power. Only a few farms under five hectares use chemical fertilizers. In Cuzco, for example 6.8% do use commercial fertilizers but the figure for Ancash is a flat zero and only .7 % of small farms use them in Cajamarca. Roughly similar percentages of small farms buy seed corn rather than saving it from year to year. There is practically no irrigated land used for corn in the sierra.

Impact of the Project: The financial returns of the Project should be considered in nutritional terms. Assuming the farm continues to plant about one third of the land in corn during the project period, net family incomes would increase up to 6% on small farms. This increase will, of course, depend on the actual area normally planted to corn and the actual availability of off-farm employment. Where farms dedicate all of the land to corn, farming incomes will increase by 20% or more while the net family income will vary according to the magnitude of off-farm employment.

Table 3 - I: Impact of Corn Production on Farm Incomes

Farm Size (Ha.)	Ha. Corn	Present Total Income S/.	Off ^{1/} Farm Income S/.	Farm ^{2/} Income S/.	Project ^{3/} Increment from corn S/.	Total with project	%
1	.37	10,450	6,450	4,000	296	10,746	(+3)
2	.74	14,000	6,000	8,000	592	14,592	(+4)
3	1.11	17,550	5,550	12,000	888	18,438	(+5)
4	1.48	21,100	5,100	16,000	1,184	22,294	(+6)
5	1.85	24,650	4,650	20,000	1,480	26,130	(+6)
6	2.22	28,200	4,200	24,000	1,776	29,976	(+6)

^{1/} Based on S/.43/day wage at 150 days/year; days worked off farm reduced as farm size increases.

^{2/} USAID estimate.

^{3/} Assumes 37% farm income derived from corn and a "with project" increase 20% in yield (largely in kind)

The benefits of increased highland corn production are likely to be reflected in increased on-farm consumption of corn, a corresponding reduction in family purchases of the commodity, increased numbers of small livestock -- chickens, cuyes and pigs that can be maintained by the family and finally, small increases in the marketing surplus of corn.

Were these increases to involve greater investment risks on the part of the farmer, investment in this project

element would be questionable. No such risks are contemplated, however. The Project provides for a large complement of technicians to help overcome the anticipated resistance to change because of technical risks as perceived by naturally skeptical farmers. A gradual, patient, conservative approach will be used.

It is not desirable or feasible to distinguish between marginal and optimal corn production areas. Since the failure of earlier attempts to shift farmers to completely new varieties and heavier application of inputs, sierra corn research has been directed toward marginal areas, improved but traditional varieties, and unchanged technology. Optimal land in the sierra is, by definition quite limited -- it must be irrigable and relatively flat. There is no irrigated corn land in Cajamarca; only 0.1% and 0.2% is irrigated in Ancash and Cuzco respectively.

With regard to corn producers, this Project is almost exclusively dedicated to producing nutritional, rather than financial or economic benefits. This choice is made of necessity and grows out of past experience in Cajamarca. Under the Peruvian Ministry of Agriculture, CIMMYT and Ford Foundation a pilot project to introduce new corn varieties based in an input package model was attempted beginning in 1976. In 1974 only 34 small farm producers in a target group of more than 20,000 had accepted new varieties. In the following year 15 of those had discontinued their use and only 2.53% of all producers, large and small, were using new varieties. The lessons learned from this experience were that new varieties were less desirable than improved varieties, regardless of yields, and that it is not feasible to rely on systems that require credit for investments in inputs that farmers are not willing to make.

Improved varieties adapted to several mountain regions are now available for reproduction, demonstration and diffusion. These are the same varieties that farmers now use but are selected for higher yields under harsh conditions. The seed of improved varieties will be made available by production agents on a barter basis - improved seed exchanged for the farmers seed. There will be no reliance on credit mechanisms during the life of this Project in recognition of the limited use of inputs and the skepticism of the farmers regarding institutional credit. Once the farmer has accepted new seed, production agents will teach him how to maintain and improve it still further. It

should be noted that the lack of extension activities has been a real drag on agricultural production in general for the last five years while the Ministry of Agriculture was occupied with implementing Agrarian Reform and the Ministry of Food did not exist. This lack was felt particularly in the Sierra and fell most heavily upon small and medium farmers. Only 3.5% of sierra farms under one hectare received any kind of technical assistance in 1972. As a non-priority crop corn received much less technical assistance than others.

4. The Role of Women

a. Corn

Women play an essential, traditional part on small farms in Peru from the decision to produce, through planting, tending, and harvesting, to marketing. Seed selection and care is entirely in the hands of women. They contribute at least 50% of the labor during planting and harvesting and nearly all of the labor involved in weeding. After the harvest, women assume almost 100% of the responsibility for handling the crop. They are in charge of drying the grain, of the winnowing, of storing the grain, of selecting which will be used for family consumption, which for seed (the best grain is saved for this purpose), which will be stored, and which will be sold in either raw or processed form. In the latter case women handle the processing and are totally responsible for marketing.

Peruvian sociologists report that, in much of the sierra, men will not make economic decisions such as the adoption of new seeds, without consulting the women. Indeed, seeds are considered "hers"; no disposition can be made without her consent. Women are commonly seen at demonstrations and field days where they are counted among the most alert participants. For this reason it is expected that women will be the most effective channel for technology transfer in the sierra corn program. A small number of women are now employed as field agents. Ministry of Food officials agree that more could be used and every effort will be made to secure their services in the corn program.

b. Soybeans

In the production aspects of the soybean program women's roles will not be as important as in corn, though they will certainly form a significant part of the work force.

On the processing research side however, women will play a major role. The first participant trainee from IIAI is a female food technologist now studying at the University of Illinois. Her role will be critical in processing and testing soy products. Many of the IIAI technicians are women and will receive in-country training from contract technicians. Most of the people who will participate in food quality testing at IIAI will be women -- the opinion leaders in the field.

There will be no obstacles to foreign degree training for women in other technical aspects of soybean production and research. Ministry officials have been asked to seek possible female candidates and have indicated their willingness to do so.

B. Economic Feasibility

1. Soybean Program

a. Conclusions

As demonstrated in the financial analysis (Section III B), rice followed by soybeans will probably be the most likely crop rotation in the project target areas. Therefore, to simplify the analysis of the project's potential impact on the economy as a whole, costs and returns to rice (or any other first crop) are ignored and the analysis is concentrated solely on the second crop. The methodology used takes the "with" and "without" approach, i.e., only additions to costs and returns directly associated with the project need be considered.

Soybeans will be introduced as a second crop, probably following rice or corn. The question arises whether or not corn will compete with soybeans for land use during the second crop season. Technically it is possible to grow corn following rice if mechanized plowing is practiced. Therefore, the estimate of the future impact of the project on the economy can be refined by considering two alternative hypothetical situations: (1) soybeans are the only second crop possible given technology found in the target zones or (2) corn is a possible second crop if machine plowing is introduced, so soybeans must compete with corn for use of land during the second growing season.

Conclusions of the economic analysis are:

(1) Primary benefits far exceed primary costs if it is assumed that soybeans do not compete with corn as a second crop in the target area. If corn competes, the project is not of maximum feasibility. However, the financial analysis indicates that most of the project hectares will fall within the "non-competitive" category. Therefore, the net present worth of the Project is on the high side

of the average of two estimates presented below (-\$2,275,390 and \$13,612,588). A conservative estimate of the net present worth (NPW) of the project is therefore the average of the two estimates (\$5,668,599.).

(2) Secondary financial benefits in marketing and processing will be nominal.

(3) The project is expected to generate 1,462,000 days of on-farm employment and an indeterminate number of days of employment in the processing industry.

b. Basic data adjustments, methodology, and analytical results

(1) Costs

(a) Equipment: Total FY-77 = \$149,000.

(b) Production of Basic Seed, Demonstration Plots, Costs of Research and Extension Agents and U. S. Advisors:

i. Basic Seed S/.18,000/ha. (+ handling and transportation costs)

Average cost per kg. is S/. 23, the price of seed to the farmer.

ii. Demonstration Plots

Costs of producing basic seed and seed for demonstration plots assumed to be just recovered by sale of seed. The price of seed to farmers just equals the cost of producing the seed. The net result is that all seed investment and operating costs are reflected in farmers' operating costs.

iii. Salary and Support Costs, GOP Researchers and Extension Agents

	<u>Ext.</u>	<u>Research</u>
(i.) Basic salaries, benefits	\$6,500.	\$11,500.
(ii.) Travel, office equipment, and supplies	<u>3,500.</u>	<u>2,000.</u>
Total per man cost:	\$10,000.	\$13,500.

(iii.) Salary and Support Costs, U. S. Advisors

Assumed total cost per man-year for technical advisors of \$50,000, including salary, benefits, and local support.

(c) On-farm Costs of Production per Hectare

Production costs for soybeans and corn, as compiled by technicians of the Zone IX field office and as adjusted by USAID are:

i. <u>Soybeans</u>	<u>Actual</u>	<u>Adjusted</u>
Total:	S/.15,281.	S/.12,526.
ii. <u>Corn</u>		
Total:	S/.16,148.	S/.13,393.

Estimated "actual" costs of production are based on the best available detailed cost estimates for the project area, those done for the Cooperative, Peru Oriental Ltda. #104 (in the Tingo Maria area). "Adjusted" costs reflect adjustments for subsidized fertilizer prices, foreign exchange premiums applied to fertilizer and machinery, and a shadow price for unskilled farm labor. The machinery cost adjustment assumed that 80% of farm-machine components are imported. Fertilizer subsidies currently total about 40% of the import price and the sol is estimated to be 33% overvalued vis a vis the U. S. dollar. The shadow price of unskilled labor was estimated as follows:

- (1) Labor earnings foregone to produce either corn or soybeans as a second crop rather than leaving the land fallow for 6 months is assumed equal to what could be earned harvesting rice for other farmers on the area;
- (2) an average of 31 man days of labor is required to harvest rice;
- (3) 100 total working days are available during the 6-month period in question;
- (4) the official wage (including social benefits) for unskilled farm labor is S/.164 per day; therefore
- (5) the true price of labor (shadow price) used to

produce either corn or soybeans as a second crop is:

$$31/100 \times S/. 164.00 = S/. 51.00 \text{ per day.}$$

(d) Change in Costs of Production with Addition of Soybeans

i. Assuming that soybeans compete with corn as a second crop, the net change in cost of production is simply the difference between costs for corn and costs for soybeans. Thus, from part C above we calculate:

$$S/.13,393/\text{ha.} \text{ minus } S/.12,526/\text{ha.} = \underline{S/.867.00}$$

This figure is then multiplied by the number of hectares of soybeans introduced each year by this project to arrive at the total annual change in production costs attributable to the project.

ii. It is known that corn cannot be grown as a second crop under all conditions in all regions in which soybeans are to be promoted under this project because the required growing season is too long and machinery is not available to shorten it. In these instances, soybeans, having a shorter growing season, compete only with fallow which may be assumed to have zero cost for purposes of this analysis. Thus, the net additional cost associated with this project would be simply the cost of producing soybeans (S/.12,526/ha.) multiplied by project hectares.

iii. No data are available which would enable a precise estimate of the number of hectares on which corn is competitive with soybeans as a second crop. Therefore, as a kind of sensitivity check, it is arbitrarily assumed that, on the one hand, corn and soybeans are not competitive on any of the land affected by this project and, on the other hand, soybeans and corn are competitive on all such lands. In other words, the change in costs arising "with" this Project is S/.867. per hectare multiplied by the number of hectares assuming that corn competes with soybeans as a second crop. This is labeled alternative #1. If corn and soybeans do not compete for land, then the change in costs "with" the project is S/.12,526 per hectare multiplied by "project" hectares. This is labeled alternative #2.

(2) Price of Production

(a) Price of Production

i. Official Peruvian Prices

	<u>S./MT</u>	<u>\$/MT at S/.45/\$</u>	<u>\$/MT at S/.60/\$</u>
Corn	9,200	204,44	153.33
Soybeans	15,000	348.89	261.67

ii. World Price (CIF Callao)
(Average 1974 - 76)

	<u>S./MT</u> <u>Official</u> <u>Exchange</u>	<u>S./MT at Shadow</u> <u>Foreign</u> <u>Exchange</u>	<u>\$ / MT</u>
Corn	7,029	9,372	156.20
Soybeans	10,049	13,392	223.21

(b) Estimated total hectares of soybeans to be planted under the project each year, average yield, and production by years.

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
i. Total Has.	5,000	8,000	12,500	22,000	34,000
ii. Total Production (MT)	7,275	12,000	19,575	35,800	56,050
iii. Weighted average yield (Kg./Ha.)	1,455	1,500	1,566	1,627	1,648

(c) Estimated production of corn foregone by introducing soybeans

i. Yields of corn for the high selva region vary between 1,800 kg/ha. and 3,000 kg./ha., according to various official and extra-official sources. The simple average (2,400 kg./ha.) is used in this analysis given that cost of production estimates were based on an intermediate level of technology, i.e., machine land preparation and a medium level of fertilizer application.

ii. Production of corn foregone by substituting soybeans under the two alternative assumptions regarding competition between corn and soybeans described above:

Alternative #1:	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
(Soybean compete with corn on all hectares)					
(MT)	12,000	19,200	30,000	52,800	81,600
Alternative #2:	No production foregone.				

(d) Computation of primary benefits:

i. Under Alternative #1, net additional benefits to the Peruvian Economy arising from the introduction of soybeans are the value of soybean production less the value of corn production foregone, plus the amount by which production costs of soybeans fall below costs of producing corn.

ii. Under Alternative #2, net additional primary benefits are the value of soybean production less the total cost of producing soybeans.

(e) Benefit/cost analysis: Primary benefits and costs Benefit/cost ratios and the respective net present worths computed under the two alternative approaches are:

	<u>Benefit/Cost</u>	<u>Net Present Worth</u>
Alternative #1	0.08	- \$ 2,275,390
Alternative #2	1.56	+ \$ 13,612,588

Thus, assuming that soybeans compete with corn on all farms affected by this project (alt. #1), it must be concluded that the project is not economically as advantageous as producing corn as a second crop where feasible; whereas, assuming that addition of soybeans to the possible crop mix enables all farmers to grow a second crop where none could have been grown before, the project is highly desirable.

The measures summarized in the above tabulation were computed assuming a 15% rate of interest to discount annual flows of costs and benefits. Thus, a benefit/cost ratio of one or greater insures that the internal rate of return is at least 15%. Relative prices of all inputs and outputs related to the project are expected to remain in approximately the same relationship in 1986 as they have in 1976, so no adjustment was made for inflation.

(3) Secondary Benefits

(a) Employment and Income in the Food Marketing Sector

The project will probably have only nominal impact on employment and income in marketing as the total volume of all crops produced is likely to be increased only marginally by the project. Soybeans will generally be added as a second crop which substitutes only for fallow. Though there will be a slight addition to the total volume of commodities entering market channels, these channels are assumed to be operating below capacity. Therefore, employment and income generation is assumed to be marginal, and no firm estimate is attempted.

(b) Employment and income in the oilseed processing industry.

The industry is now characterized by 50% excess capacity relative to current demand. To the extent that domestic soybean production substitutes for oil and meal imports, utilization of excess oil-processing capacity could be counted as a secondary benefit from this Project. Indeed, if soybean production stimulated by this project were to substitute only for imports of vegetable oil, then given excess capacity in the processing industry, net returns above variable costs in soybean processing could be counted as a direct benefit to the soybean project. However, an alternative to growing more soybeans is importing more soybeans, so secondary income benefits would accrue to the project only to the extent that importing soybeans were cheaper than growing them. The cost of producing soybeans is currently below the import price by only about \$27/MT, a differential that can expand and shrink in a free market. It is therefore concluded that only nominal secondary income benefits will accrue from the soybean project in the processing industry.

2. Economic Feasibility -- Corn Program

The total value of additional corn production stimulated by this project may be considered a benefit to the economy of Peru. Production costs are those associated with the seed production program, i.e., it is assumed that the farmer himself does not incur any additional operational costs. Other program costs include professional staffs (both GOP and AID advisors), vehicle maintenance, research and extension equipment and the like which, of course, are net additional costs to the project in a strictly economic sense.

TABLE 3-J, ECONOMIC ANALYSIS OF THE SIERRA CORN PRODUCTION PROGRAM

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>Total 1977-1983</u>
<u>GOP Costs (\$000)</u>								
Professional Staff	189.2	231.0	285	331	331	350	350	
Manual Labor	250.0	250.0	250	250	250	250	250	
Vehicle Maintenance	46.0	46.0	46	46	46	50	50	
Seed	53.6	80.0	136.8	106.4	80	80	80	
Total:	538.8	607	717.8	733.4	707	730	730	
<u>AID Costs (000)</u>								
Equipment	480.0	--	--	--	--	--	--	
Participants	100.0	46.	--	--	--	--	--	
Technical Assistance	23.0	38.5	38	10.0	--	--	--	
Local Support Costs	5.0	5.	5	--	--	--	--	
Total:	608.0	89.5	43	10	0	0	0	
TOTAL COSTS ^{3/}	\$1,146.8	\$ 696.5	\$ 760.8	\$ 743.4	\$ 707	\$ 730	\$ 730	\$5,514.5
TOTAL BENEFITS ^{1/3/}	0	456.0	608	1,672.0	2,584.0	3,040.0	3,420.0	11,780.0
NET BENEFITS (Cash flow)	-1,146.8	-240.5	-152.8	+928.6	+1,877	+2,310	+2,690	6,239.1 ^{4/}
DISCOUNTED NET BENEFITS ^{2/}	-997.7	-181.8	-100.5	+531.2	+ 917.7	+ 999.7	+1,011.4	2,180.2 ^{4/}

^{1/} Assumes: 20% gain in yields on all projects hectares valued at S/.9.5/kg.

^{2/} Net present worth is equal to the sum of discounted net benefits.

^{3/} The Benefit/Cost ratio is 1.64, discounting total costs and total benefits at a 15% rate of interest.

^{4/} CB ratio has not been adjusted to the changes resulting from (a) devaluation and (b) reduction of AID costs. However the outcome should be more positive as a result of these changes since the dollar costs would be reduced and value of corn has increased.

As the corn project is justified on social financial grounds, only a very simple test of economic feasibility has been applied. The benefit/cost ratio was computed for the period 1977-1983, using an interest rate of 15 percent to discount future cost and income streams. Thus, a ratio of one or greater insures that the internal rate of return on the investment is at least 15%. This rate is the benchmark widely used to judge project feasibility. The resulting benefit/cost ratio was 1.64 indicating that the project is highly justifiable on economic grounds with returns well in excess of 15%.

Certain simplifying assumptions were made in computing the ratio. These were: 1) all prices are expected to increase roughly proportionately, thereby eliminating the need to adjust either costs or benefits for inflation, 2) yields are assumed to increase by 20% on all affected farms, and 3) no shadow pricing of foreign exchange or product prices was done because floury corn (mainly consumed as "cancha") enters foreign commerce in only limited quantities.

The estimated cash flow generated by the project for 1977-1983 is presented in Table 3-J. The net present worth of this project is \$6,239,100, discounting the cash flow at a 15% rate of interest.

E. Summary Budget Analysis and Plan

(See Annex B for Detailed Cost Breakdown and Technical Details)

1. AID Direct Costs:

Technical Assistance Contracts	965,000
Local Support (Administration)	83,000
Soybean Equipment	135,000
Corn Equipment	361,000
Soybean Participants	309,000.
Corn Participants	<u>119,000.</u>
	\$1,972,000

2. COP Direct Costs

Soybean Personnel and Administrative Support	\$1,473,000
Soy Vehicle operation & Maintenance	181,800
Corn Personnel and Admin. Support	1,130,200
Corn Manual Labor	1,000,000
Corn Vehicle Operation & Maintenance	185,000
Corn Seed	<u>376,000</u>
	\$4,346,600

3. Budget Evaluation

The costs of this Project to MinFood are about double the estimates available at the time of PRP preparation, primarily because of the increased number of personnel the Program Coordinators consider necessary to accomplish the technology transfer to meet programmed goals. These annual costs represent budget targets which are being established by MinFood for approval by December of 1976.

Given the high priority of the two crops, budgetary levels of the magnitude contemplated seem likely to be achieved. They may constitute one to two percent of the total MinFood Budget for the biennium 1977-78 and less than that for the 1979-80 period.

Total final funding levels for the two coming biennia are, of course, unknown. However, the magnitude can be judged by the following MinFood budget summary:

1975-1976 FOOD SECTOR (MINFOOD) BUDGET
US\$000

Source of Funding				
Treasury	MinFood Income	External	Internal Credit	TOTAL
41,337	215.5	9,264.5	3,542.2	54,360

Since the budgetary level was established by dividing the total originally budgeted to the Ministry of Agriculture before it was split up to create the Ministry of Food, succeeding MinFood budgets can be expected to greatly exceed present levels. The

corn and soybean programs will not absorb an inordinate part of these budgets and can be sustained with anticipated resources.

4. SUMMARY COST ESTIMATE AND FINANCIAL PLAN

(US \$ 000)

PROJECT PAPER

Source	FX	A.I.D.		Host Country		TOTAL
		LC	LC	FX	LC	
<u>A.I.D.:</u>						
T.A. Contracts	910		55			965
Local Support	-		83			83
Machinery and Equip.	472		24			496
Part. Training	312		116			428
<u>G.O.P.:</u>						
Personnel & Support					3,603	3,603
Vehicle Maintenance and Operation					367	367
Corn Seed					376	376
Contingency						
TOTAL:	1,694		278		4,346	6,318

COST OF PROJECT OUTPUTS

(US\$ 000)

Project Inputs	#1 Soy R&E Network	#2 Corn R&E Network	#3 Corn Seed	#4 Adapted Soy Variet.	#5 Trained Technicians	#6 Production Plans	#7 Soy Products	Total
AID Appropriated:								
T.A. Contract and Local Support Costs	271	187	35	215	24	45	271	1,048
AID Equipment	86	320	40	40			10	496
Participant Training					428			428
								1,972
Host Country:								
Personnel / Admin. Support	825	951.8	1,130	427.7	98.6	60.1	110	3,603.2
Vehicle Opn. & Maint.	121.8	140	45	40		10	10	366.8
Seed Fund			376					376
								4,346.0
Other U.S. (Financed under Project 060 and Tech.Suppt.)								
Equipment	110						50	160
Technical Assistance			5	7		80	20	100
Technical Support								12
TOTAL (\$000)	1,413.8	1,598.8	1,631	729.7	550.6	195.1	471	6,590.0

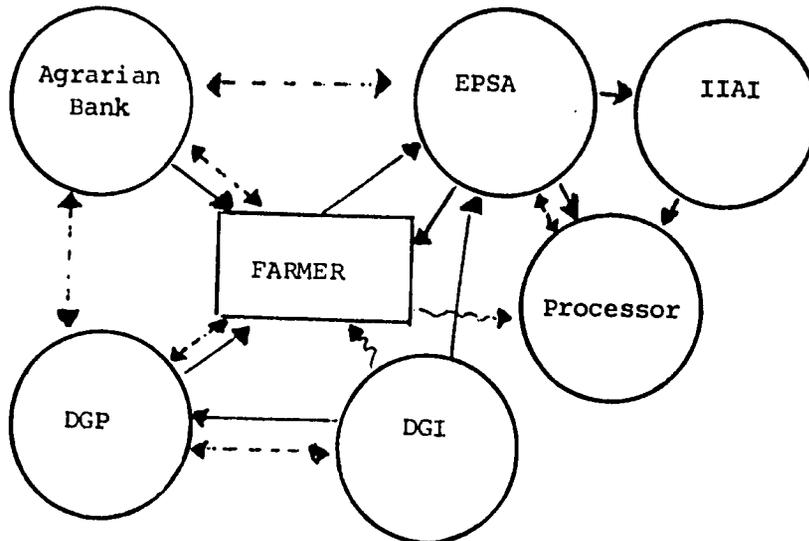
IV. IMPLEMENTATION ARRANGEMENTS

A. Recipient Agencies

The GOP executing agencies for this Project are described in Section I, C.2., where their roles are delineated.

B. Soybean Production and Research Coordination

The following diagram presents the conceptual framework for coordinating activities between the several implementing agencies and the recipient group.



Straight, unbroken arrows represent goods or services rendered. Dashed lines indicate coordination required. Wavy lines indicate supporting means of delivery of goods and services. The specific coordination requirements are described below by function.

* Note: This PP does not include a page 48.

1. Credit

The Agrarian Bank offices and branches must coordinate with both farmers and DGP representatives in order to deliver credit. This is accomplished by defining credit needs crop by crop through farmers nuclei under farm plans approved by the DGP's production agents. These farm plans qualify farmers for credit. Production agents may facilitate the processing of specific loans; however the final decision falls to the Bank and usually depends on the farmer's creditworthiness, security of tenure and soil preparation. Branch banks in Tingo Maria and Bagua have set aside special funds for soybean production and are in almost daily contact with DGP on the subject of soybean credit. Therefore, coordination for credit delivery raises no problem at present or in the foreseeable future insofar as soybeans are concerned.

The Agrarian Bank and EPSA coordinate loan repayments. When farmers sell to EPSA, a check is drafted to the farmer and the AgBank. If the farmer has a debt to the Bank, it retains that portion of the proceeds of sale owed according to the terms of the loan. If there are unpaid amounts owing from past loans, the Bank negotiates full or partial payment from current proceeds, depending upon the needs of the farmer and the seriousness of the arrearage.

2. Technical Assistance

Technical Assistance to farmers is almost completely in the hands of DGP. Soybean production agents, now being appointed, are the means of delivery. The DGI feeds technical information to the DGP through technical bulletins and field days. Farmers are usually invited to attend field demonstrations at research stations so that DGI contributes in a minor, but significant way to technical assistance delivery.

3. Foundation Seed

Foundation Seed production is also a DGI function and under the project the DGI will contribute to the supply of official seed for sale to farmers. This seed will be sold to EPSA which, in turn, will market it to farmers. In selected cases early in the project, DGI will market foundation seed directly to farmers in coordination with DGP. DGP will supervise official seed production for sale to, and resale by, EPSA. There is a differential paid for official seed production. EPSA pays S/.21.00 and sells at S/.23.00.

4. Marketing

Marketing is an EPSA function. Even if farmers deliver directly to processors, EPSA is the paying agent and has representatives on hand at the plants to evaluate moisture and trash content.

Truckers are contracted by EPSA to move grain from its warehouses to central storage or distribution points, deducting S/.2.00 from the grain price to help cover costs. At present soybeans move from Tingo Maria to Lima and from Bagua to Piura. By Peruvian standards roads are dependable between these points, even in the rainy season.

5. Other Inputs

Private input suppliers do not appear in the diagram but will play an important role in provisioning farmers with inoculants, fertilizers and machinery. As a promotional device, private suppliers lent seeders for the recent seed production campaign in Bagua, and they delivered the necessary inoculant. Service cooperatives will play a role as well. These are particularly strong both in Bagua and the Tingo Maria area. DGP will play a coordinating role in this process.

6. Processing

IIAI's principal function is to develop and test processing methodologies for adoption by commercial food processors. To do this IIAI must acquire raw materials from EPSA and furnish processors with research results, product specifications, and samples. The system is established and functioning for several commodities. Only equipment and some technical assistance is required for soybeans.

7. Grades and Standards

In Ministerial Resolution No. 0138-76-AL of March 10, 1976 the Ministry of Food established grades and standards for soybeans. Before this resolution, farmers had expressed some concern that they were not receiving full value for their product, particularly when sold directly to processors without official intervention in the transaction. Current grades and standards apply to moisture and trash content; a progressive reduction in payment is placed on moisture above 12% and on trash above 4%. No mention is made of grain size, broken beans, oil content, or other quality characteristics; however, these elements can be added to the regulation as

processing demands dictate. The present standards are similar to those applied in the United States. They reflect the GOP's intention to maintain the quality required and they are adequate under present conditions. The Project will provide assistance both in marketing and in grades and standards, as well as processing in order to achieve whatever adjustments in grades and standards as may be necessary as the Project moves toward development of any products for human consumption. The main problem anticipated relative to soybean quality will be moisture content, especially in beans from jungle areas other than Bagua. Hand harvesting and winnowing produces few broken or damaged beans and reduce trash to an acceptable level.

8. Transportation and Storage

In Tingo María, the wettest production area, EPSA will buy beans for immediate shipment to Lima, attempting to dry and store only in emergencies. Both drying and warehousing facilities are available if needed to handle temporary surplus. Dryer climatic conditions prevail in Juanjui and Tarapoto where transportation is correspondingly more difficult. In those zones longer periods of storage will be necessary. Since Peru has excess processing capacity and a shortage of vegetable oils, beans will be processed immediately upon arrival at processing plants, mainly on the coast. Beans for processing into soy flour and beverages will likewise be of acceptable quality as they arrive at processing plants fresh from the fields, reasonably clean and in good condition, with slightly more than 12% moisture content.

9. Administrative Capacity

A key element in both corn and soybean production programs will be the Zonal Organizations which are, in effect, models of the National Ministerial organization. Zonal Offices encompass research, production, marketing, credit, and other functions under one zonal head - the regional equivalent of the Minister of Food. This form of organization is part of a general movement toward decentralization of governmental functions and involves budgeting from the smallest unit upward and coordination at successive levels. The national level provides leadership in the process by setting priority targets and advising zonal and sub-zonal offices on their probable budgetary requirements for personnel and other support for field operations. In special cases such as soybeans, therefore, the national leadership can anticipate budgetary requests and be prepared to guarantee their approval; in effect the Ministry can still assign personnel and equipment to zones for specific purposes.

Woven into the system is a national production plan formed initially by farmer groups, organized according to commodities, whose plans are consolidated and adjusted in interaction with a national council to produce comprehensive farm production plans. These plans are the basis for credit and technical assistance as well as the provision of certain kinds of inputs.

MinFood is a new organization and is in the process of fleshing out this system. To date it has operated on the basis of the 1975-76 biennial budget which was divided between the MinAg and MinFood when the MinFood was created. Budgets for the biennium 1977-78 are now being considered at the zonal levels and national soybean and corn coordinators have advised those levels of the probable personnel and budgetary support they can expect to be approved. At the national level MinFood is proceeding with confidence that its budget will have the highest priority since it is a new organization attempting to implement and staff a new production system of primary importance to the national economy. The heavy emphasis being placed by the Morales Bermudez government on production coupled with a drastic shortage of foreign exchange reinforces the priority of any productive activity which can supply needed food commodities and reduce foreign exchange outlays.

The leadership of MinFood is technically oriented because, unlike the MinAg whose primary goal is to execute agrarian reform programs, the MinFood's function is food production and its personnel were selected accordingly. The national leadership below the Ministerial level have, in general, advanced through the ranks. The heads of DGI and DGP and the corn and soybean coordinators all fit this category and have broad knowledge and field experience. Salary schedules have been augmented in recent years and, in addition, a complete range of social benefits have been added. Decentralization has raised morale in the field by placing greater authority and responsibility at that level, lessening somewhat the preference for work in Lima. New personnel enter the system from the several agricultural schools of Peru, the foremost of which is UNA at La Molina. The corn program will recruit mid-level technicians from the production areas themselves in order to assure continuity of extension agents. The soybean program will draw principally from La Molina and secondarily from outlying universities.

Long-term participant trainees, particularly degree recipients are to serve two years for every year of training. Originally there were strong reservations concerning the advisability of Post Graduate training under this Project because of a tendency for such

talent to seek better paying jobs outside the government or in other countries. In view of the regulations and the long term needs of the Project, these reservations have subsided.

The all-pervasive problem of material support of field agents is still present and unlikely to be resolved completely during the life of this Project. Field agents lack transportation facilities. The production agency in Bagua has two pick-ups and one motorcycle for its staff of 12 professionals. Farmers there complain of a lack of contact with extension personnel and cite their lack of vehicles as a root cause. This problem will be resolved gradually as production agencies begin to budget for their own support but GOP resources are limited by a lagging economy and the solution will appear only gradually. The provision of vehicles under this Project will aid soybean and corn agents and producers but the general problem will persist several years for other crops.

Administratively, the Project is on untested ground but it has the advantage of being staffed with proven personnel in key positions. Within MinFood there is a determination to make the new system work to break through the barriers that have stultified production for the last several years. Strong support has been granted to Corn and Soy Program coordinators' recommendations on prices, marketing, standards and personnel. The Project is, then, an integral part of a new system that can count on full support at all levels and is of great potential importance to the economic well-being of Peru.

C. Corn Production and Research Coordination

The DGI, DGP and PCIM will employ an integrated team approach to sierra corn improvement, building upon a small contract now in force between MinFood and PCIM whereby PCIM personnel work in the zones, with MinFood personnel in both research and extension. The bulk of the new personnel will be contracted by PCIM and will be assigned to zonal offices and agencies where they will perform in research, plant breeding, demonstration, seed production, and extension, with emphasis on the function indicated for their area during the specific crop season. Where improved seed is available in sufficient quantity and has a predictable demand, their primary function will be extension. In such cases relatively more extension personnel will be assigned to carry out the mission. Where only research and plant breeding for varietal improvement is indicated, one or two technicians will be assigned, their number to be augmented as the area is moved to seed propagation, demonstration and extension phases. (See Annex B, Part III for projected personnel assignments.)

The method of dissemination will be simple and straightforward, based on a sufficient number of personnel and their logistic support. Starting in provinces where research is not well advanced, an Agronomist, one or two technicians, assigned from either MinFood or PCIM, and a complement of workers will make varietal collections and establish plant breeding plots (in PCIM experience, each successive season produces improved seed yielding 6-8% more than its progenitors). These plots will not be used for demonstration. When improved varieties are produced, stabilized, and checked for acceptability, the staff will be augmented and seed production/demonstration plots will be established in as many locations as possible, usually on actual farms, in cooperation with a farmer, and using traditional practices. If field evaluations indicate success in this phase, the process will move to extension in one or two years. Extension itself will be based on improved seed almost exclusively. Introduction of fertilizers, insecticides and other technologies will in the main, be postponed until the new varieties are well and fully accepted in order to reduce the perceived risk to farmers.

While the program moves into the extension phase, research and plant breeding will continue to seek better varieties which can be introduced further along, thus completing the cycle. Presumably the varieties produced later will have had their acceptance problems eased by the success of earlier varieties. It will be this phase of the process that sees the introduction of high lysine varieties.

PCIM, in consultation with MinFood, will play the key role in program coordination. Its specialists, who originated the program concept, will evaluate the status of each area and determine the specific tasks and targets for each season, the varieties that are showing promise, and the personnel requirements. PCIM will also take the lead in training the personnel who will work in the zones and will coordinate degree training at La Molina. In addition it will maintain the germ plasm bank and carry forward the more sophisticated research involving high lysine varieties.

Given PCIM's performance, recognized expertise, and association with UNA, an agricultural university of considerable standing in Latin America, their vital role in the program holds promise of success. The nature of the field research to be conducted is relatively simple and can be managed by comparatively unspecialized personnel. The efficiency of the integrated approach is reinforced by the fact that often the distinction between research plots, seed propagation fields and demonstration plots will be blurred, one field serving all three purposes in varying degrees.

D. A.I.D.

The principal functions of A.I.D. will be to provide technical assistance through a U.S. Contractor, to order and coordinate the delivery of the equipment required for the project, and to coordinate participant training. PIO/Cs, PIO/Ts and PIO/Ps will be the principal methods of disbursement. In-country expenditures for construction of certain items of equipment can be accomplished by Purchase Order.

Day to day monitorship will be accomplished by contract technicians through the A.I.D. Project Officer and through periodic Ministry Reports.

1. Logistic Support

The MinFood is preparing its budget for the biennium 1977-78 in which it will provide for salaries and logistical support of the additional personnel and equipment sponsored by this Project. The budgeting process is in its preliminary stages and will not be completed until December. Corn and soybean project coordinators are including logistical and support services covering both personnel and equipment in their budget estimates. The logistical support for this project -- vehicle maintenance, travel expenses and office support -- is uncomplicated and well within the MinFood's capability, assuming appropriate budgetary levels.

2. Contracts

A direct A.I.D. Contract will be negotiated on a sole source basis with one or two U.S. universities, possibly the Universities of Illinois and Iowa, for the provision of technical assistance and minor amounts of materials and supplies such as printed matter, and expendable research supplies.

A similar contract will be drawn between MinFood and PCIM for a large part of the research work and personnel required for the corn program. PCIM has an existing Government contract along similar lines for other corn research. It can sub-contract the new technicians with this funding and finance training for MinFood and new PCIM field agents.

E. Implementation Plan

1. Soybeans

<u>No.</u>	<u>Major Events and Milestones</u>	<u>Completion Date</u>	<u>Responsible Agent</u>
1	Approve project	9/ /76	AID
2	Sign ProAg	10/ /76	MinFood/AID
3	Soybean short course	10/ /76	AID/DGP
4	Counterpart budget approved	2/ /77	MinFood
5	Soy T.A. on board	2/ /77	AID
6	Counterpart technicians assigned	2/ /77	MinFood
7	Begin Soy Production Research	4/ /77	DGI
8	Research and Production Equip. in place	12/ /77	AID
9	15,000 ha. planted	12/ /78	DGP
10	Processing equipment in place	12/ /77	AID
11	Begin processing research	1/ /78	IIAI
12	Official seed for 20,000 ha.	6/ /79	DGP
13	Complete Testing Soy Products	6/ /79	IIAI
14	20,000 ha. planted	10/ /79	DGP
15	3 soy products adopted by Industry	12/ /79	IIAI
16	35,000 ha. planted	10/ /80	DGP

2. Corn

<u>No.</u>	<u>Major Events and Milestones</u>	<u>Completion Date</u>	<u>Responsible Agent</u>
1	Approve project	9/ /76	AID
2	Sign ProAg	10/ /76	AID/MinFood
3	Counterpart budget approved	2/ /77	MinFood
4	MinFood counterpart assigned	2/ /77	MinFood
5	MinFood/PCIM contract signed	2/ /77	MinFood/PCIM
6	New Corn personnel contracted	3/ /77	PCIM
7	T.A. on board	3/ /77	AID
8	Mid-level corn technicians trained	4/ /77	PCIM
9	Equipment in country	8/ /77	AID
10	Improved varieties ready for Ancash, Junin, Cuzco	10/ /77	DGI/PCIM
11	300 ha. seed planted Ancash, Junin, Cuzco	10/ /77	
12	Seed for 12,000 ha. distributed Ancash, Junin, Cuzco	10/ /78	DGI/PCIM
13	450 ha. seed planted for Ancash, Junin, Cuzco	10/ /78	DGI/PCIM
14	Seed for 24,000 ha. distributed Ancash, Junin, Cuzco	10/ /79	DGP
16	1,600 ha. seed planted for 5 Departments	10/ /79	DGI/PCIM
17	Distribute seed for 44,000 ha. 5 Depts.	10/ /80	DGP

3. General

The implementation plan must be viewed as a continuation of programs already underway. In the corn program, research is already well advanced and foundation seed is available for reproduction and distribution of tested varieties. The Project will merely provide the additional trained personnel and equipment needed to disseminate the program's benefits to large numbers of farms and to expand research. In soybeans, basic testing has been done for all areas, foundation seed is being reproduced, and the USAID has been able to provide some technical assistance. For example, in-country training scheduled for September 1976 will be financed under an existing INTSOY Task Order. Likewise, the USAID has been able to order certain critical items of equipment. Identification of participant trainees is already underway.

F. Monitoring

Contract technicians will be a primary source of information for monitoring by the USAID project officer. Each technician will work in specific areas in which his counterparts will have responsibility. Progress in that area will be observed by the concerned technician on a continuous basis against targets established in the Project Agreement. Additionally, a requirement for MinFood field reports of project activities will be stipulated in the ProAg. MinFood statistics from the various regions will be used to strengthen the monitoring process.

G. Evaluation

Provision for an annual joint evaluation involving A.I.D. and the MinFood, beginning in December, 1977 and continuing through December, 1979 will be included in the ProAg. A final evaluation will be conducted during the last month of the project. Such arrangements are the norm in Peru and, given the data sources and continuous monitorship, should involve only nominal additional costs. Given the quantifiable indicators included in the Project, effective utilization will be made of the standard PAR format.

Since soybean production in Peru is negligible at present it will be measured against a near zero base. Likewise, food use of soy products is minimal and progress can be similarly measured through industrial records and EPSA statistics.

Data on Sierra corn production do exist but lack specificity as to areas in most cases. However, the USAID has been able to sponsor a survey of production areas. This survey is expected to provide basic information on these areas as to acreage, varieties, and farming patterns against which the introduction of improved varieties can be measured. In addition, the National Production Plan calls for the generation of similar data for all crops and regions on an annual basis.

H. Conditions, Covenants and Negotiating Status

Before the signing of the Project Agreement the USAID will request adequate assurances that the Ministry of Food and the PCIM will enter into a contract to provide the additional personnel required for the sierra corn research and extension network.



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HNNEX H

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APPROVED BY AA/LA: HKLEINE
LA/DR:ANDDONALD (DRAFT)
LA/EP: SCHERNENKOFF (DRAFT)
LA/DP:LSMUCKER (DRAFT)
LA/DP:BGOLDSTEIN (DRAFT)
LA/DR:CBWEINBERGTAAGR:ELONG DRAF
A/DR:ACHABLE (DRAFT)OMLION LA/DR
LA/DR:CBREITENBACH (DRAFT)
PPC/DPRE:BODELDACHAIJ:LA/DR

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TAGS:

SUBJECT: DAEC REVIEW SOY AND CORN PRODUCTION GRANT PRP.

REFERENCES: (A) STATE 296236, (B) STATE 303479.

1. SUBJECT PRP WAS REVIEWED ON 4 DECEMBER 1975 AND WAS APPROVED, SUBJECT TO THE OBSERVATIONS AND GUIDANCE FOR PP PREPARATION INDICATED BELOW. AS PER REF A, PP SHOULD BE SUBMITTED FOR INTERIM QUARTER AUTHORIZATION, I.E. NLT 15 AUGUST 1976. THEREFORE, A CONGRESSIONAL NOTIFICATION WILL BE REQUIRED AT THE TIME OF PP APPROVAL.

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2. TARGET GROUP - THE PP SHOULD DESCRIBE IN DETAIL WHO THE INTENDED PROJECT BENEFICIARIES WILL BE AND THE NATURE OF THE BENEFITS THEY ARE EXPECTED TO RECEIVE FROM THE PROJECT, KEEPING IN MIND THE EMPHASIS ON REACHING THE POOREST FARM FAMILIES POSSIBLE.

3. SOYBEANS - THE PP SHOULD EXAMINE THE ACCEPTABILITY OF SOY AND SOY PRODUCTS FOR HUMAN CONSUMPTION IN PERU, PARTICULARLY AMONG THE TARGET GROUP. SOY PRICE POLICIES SHOULD BE EXAMINED BOTH FROM THE PERSPECTIVE OF PRODUCTION INCENTIVES TO THE TARGET FARMER AND THE EFFECT OF HIGHER PRICE ON THE AFFORDABILITY OF SOY PRODUCTS BY THE RUDOFF GROUPS IN PERU. THE PP SHOULD CONCLUSIVELY DEMONSTRATE THE LINKAGES BETWEEN THE SOY RESEARCH TO BE FINANCED BY THE PROJECT AND THE APPLICATION OF THIS RESEARCH IN SMALL FARMER SOYBEAN PRODUCTION AND SHOULD, IN PARTICULAR, EXAMINE THE TIME REQUIRED TO GET IMPROVED SOY SEEDS TO SMALL FARMERS AND INTO PRODUCTION. THE PP SHOULD ALSO ADDRESS THE FOLLOWING POINTS:

--- (A) THE NEED FOR ENFORCED GRADES AND STANDARDS AT ALL LEVELS IN THE SOYBEAN MARKETING SYSTEM AND THE WAY THE PROJECT WILL ASSURE THAT THE REQUIRED STANDARDS WILL BE IN USE DURING AND AFTER PROJECT IMPLEMENTATION;

--- (B) THE AVAILABILITY OF ADEQUATE AND PROPER SOY PROCESSING FACILITIES TO HANDLE THE EXPECTED SOYBEAN PRODUCTION RESULTING FROM THE PROJECT AND COMMITMENTS ON THE PART OF THE GOV TO BUILD ADDITIONAL FACILITIES AS SOYBEAN PRODUCTION INCREASES;

--- (C) ANY INFRASTRUCTURE CONSTRAINTS (E.G. TRANSPORTATION, LOCATION OF PROCESSING INDUSTRIES) TO GROWING SOYBEANS IN THE HIGH JUNGLE AREAS;

--- (D) THE ARRANGEMENTS CONTEMPLATED BY THE PROJECT THROUGH WHICH SMALL FARMERS PRODUCING SOYBEANS WILL MARKET THEIR PRODUCTIONS, AND THE WAY THE PROJECT WILL ASSURE THAT THE SOYBEANS MARKETED WILL BE OF THE QUALITY NECESSARY TO MAKE PROCESSING ECONOMICALLY FEASIBLE; AND

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3. (C) WHETHER SOY CULTIVATION/HARVESTING CAN BE ECONOMICALLY WITHOUT HEAVY MECHANIZATION, AND THE ABILITY OF SMALL FARMERS TO OBTAIN THE APPROPRIATE MACHINERY. THE PP SHOULD ALSO INCLUDE ASSURANCES FROM THE GOP THAT CREDIT WILL BE AVAILABLE TO SMALL FARMERS WHO WANT TO GROW SOYBEANS, BOTH THROUGH COOPERATIVE ORGANIZATIONS AND TO INDIVIDUAL FARMERS. IN ADDITION, THE PP SHOULD DETAIL THE WAY IN WHICH THE PROJECT WILL ASSURE TIMELY DISTRIBUTION OF SOY SEEDS AND RELATED TECHNICAL ASSISTANCE TO THE TARGET GROUP FARMERS.

4. CORN - THE PP SHOULD CLARIFY WHETHER THE PROJECT WILL CONCENTRATE ON "OPTIMAL" OR "MARGINAL" CORN PRODUCTION AREAS, AND THE IMPLICATIONS OF THIS SELECTION ON THE PROJECT'S ABILITY TO BENEFIT THE MAXIMUM NUMBER OF TARGET GROUP FARMERS. SOME TRADE-OFF BETWEEN INCREASED PRODUCTION AND THE OBJECTIVE OF MAXIMIZING TARGET GROUP IMPACT MIGHT BE NECESSARY AND THE CHOICE OF ALTERNATIVES SHOULD BE EXPLAINED. THE PP SHOULD ALSO DESCRIBE THE REASONS FOR A LACK OF INCREASED PRODUCTION OF HIGHLAND CORN TO DATE, AS WELL AS THE CONSTRAINTS WHICH HAVE LIMITED THE DISTRIBUTION AND USE OF IMPROVED HIGHLAND CORN VARIETIES IN THE SIERRA, AND SHOULD DESCRIBE THE WAY THE PROJECT WILL ADDRESS AND REMEDY THESE CONSTRAINTS.

5. NUTRITIONAL IMPACT - GIVEN THE PPP'S JUSTIFICATION OF THE PROJECT ON EXPECTED IMPROVEMENTS IN THE NUTRITION OF THE TARGET FARMERS AND OTHER POOP GROUPS IN PERU, THE PP SHOULD DESCRIBE THE NUTRITIONAL CONDITIONS OF THE TARGET GROUP AND THE IMPACT THE PROJECT IS EXPECTED TO HAVE ON MALNUTRITION RATES, PARTICULARLY OF MOTHERS AND CHILDREN IN THE TARGET GROUP.

6. INSTITUTIONAL COORDINATION - THE PP SHOULD DESCRIBE THE PROPOSED MECHANISM FOR PROJECT COORDINATION WITHIN THE MINISTRY OF FOOD WHICH WILL BE USED IN IMPLEMENTING THIS PROJECT. THE PP SHOULD ALSO EXPLAIN WHAT COORDINATION WITH CREDIT AND EXTENSION AGENCIES WILL BE REQUIRED DURING THE PROJECT AND HOW THIS COORDINATION WILL BE

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... (2) WHETHER SOY CULTIVATION/HARVESTING CAN BE ECONOMICAL WITHOUT HEAVY MECHANIZATION, AND THE ABILITY OF SMALL FARMERS TO OBTAIN THE APPROPRIATE MACHINERY. THE PP SHOULD ALSO INCLUDE ASSURANCES FROM THE GOP THAT CREDIT WILL BE AVAILABLE TO SMALL FARMERS WHO WANT TO GROW SOY-BEANS, BOTH THROUGH COOPERATIVE ORGANIZATIONS AND TO INDIVIDUAL FARMERS. IN ADDITION, THE PP SHOULD DETAIL THE WAY IN WHICH THE PROJECT WILL ASSURE TIMELY DISTRIBUTION OF SOY SEEDS AND RELATED TECHNICAL ASSISTANCE TO THE TARGET GROUP FARMERS.

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OF THESE NEEDS CLARIFICATION, AS PRESENTED IN THE PRP, THE LEVELS OF OBJECTIVES ARE COMPRESSED INTO ONE, I.E., TO RELATE AND DEMONSTRATE THE VALIDITY OF ALTERNATIVE SYSTEMS APPROACHES (2) INCREASE PRODUCTION BY SMALL FARMS OF HIGH QUALITY FOOD CROPS; (3) PROVIDE INCREASED AMOUNTS OF LOW COST NUTRITIOUS FOODS FOR THE POOR, THESE OBJECTIVES SHOULD BE SEPARATELY STATED, THEIR CAUSATIVE RELATIONSHIP DEFINED, AND EACH SHOULD HAVE ITS OWN INDEPENDENT INDICATORS. (NOTE: THE MISSION MAY WISH TO HANDLE THIS ANALYTICAL PROBLEM BY ADDING HORIZONTAL LEVELS TO THE CURRENT MATRIX, WITH SEPARATE TARGETS, INDICATORS, AND ASSUMPTIONS FOR EACH LEVEL). THE ASSUMPTIONS COLUMN ALSO NEEDS CLARIFICATION. FOR EXAMPLE, THE STATEMENT RE "ANNUAL INCREASE IN PLANTING OF IMPROVED CORN TO 165,000 HA. BY 1980" APPEARS BOTH AS AN ASSUMPTION AND AS AN INDICATOR OF ACHIEVEMENT OF PROJECT PURPOSE. BY DEFINITION, AN ASSUMPTION IS AN EXTERNAL FACTOR OUTSIDE THE SCOPE OF THE PROJECT DESIGN, BUT IMPORTANT TO THE SUCCESS OF THE PROJECT. THE STATEMENT OF EDPS, ON THE OTHER HAND, IS A DESCRIPTION OF THE SET OF TERMINAL CONDITIONS THAT WILL EXIST WHEN THE PROJECT PURPOSE (THE PRIMARY REASON FOR THE PROJECT) IS SUCCESSFULLY ACHIEVED. LA/DP/ES WOULD WELCOME FURTHER COMMUNICATION WITH THE MISSION ON THIS MATTER IF MISSION DESIRES.

15. ADVISE DECISION REGARDING THE ACCELERATED PHASE-OUT OF EXISTING UNIVERSITY OF IOWA PROJECT TO MAKE AVAILABLE APPROXIMATELY 200,000 DOLLARS IN FY 1976 FUNDING FOR START-UP COSTS OF THIS PROJECT WILL BE SUBJECT OF A SEPARATE CABLE. KISSINGER

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ANNEX B

PROJECT TECHNICAL DETAILS

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- PART I Detailed Costs, Participant Training Schedule and
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- PART II Soybean Seed Production Plan, Soybean Production
Targets, and Personnel Allocations.
- PART III Corn Production, Activity Schedule, Program
Locations, Seed Production Schedule, Production
Targets, Personnel Requirements and Personnel
Costs.

I. DETAILED COSTS, PARTICIPANT SCHEDULES AND DETAILED EQUIPMENT
LISTS

A. A.I.D. Direct Costs

1. AID Financed Technical Assistance

<u>Salaries</u>		\$3 94,749.
<u>Field Staff - LT Technicians</u>	(284,749)	
<u>Corn Program</u>		
Corn Production/Agronomist/Fertilizer Specialist - 21 m/m \$25,000		43,749.
<u>Soybean Program</u>		
Research Agronomist/Team Leader 36 m/m - \$29,000 per yr.		87,000.
Soybean Extension Agronomist 24 m/m - \$25,000 per yr.		50,000.
Food Processing Specialist 24 m/m - \$25,000 per yr.		50,000.
Production/Processing Economist 24 m/m - \$27,000 per yr.		54,000.
<u>Short-Term Technicians</u>	(65,000)	
<u>Corn Program</u>		
12 m/m of ST. Corn Research and Production Specialists at \$2,500 per mo.		30,000.
<u>Soybean Program</u>		
4 m/m Consumer Researcher -\$2,500 mo.		10,000.
10 m/m ST assistance for Soybean - \$2,500 per mo.		25,000.
<u>On-Campus Staff</u>	(45,000)	
18 m/m - \$2,500 p.m.		45,000.

RECORD COPY

Benefits

16% of total salaries \$394,749. = \$63,159. \$ 63,159.

Allowances - LT Technicians 141,927.

Education Allowance

25 years of education (2% of Technical Services at \$1,800/yr. \$ 37,800.

Housing Allowance

12.5 years at \$6,400 per year 67,200.

Post Differential - Long Term Only

10% of salaries \$284,479. 28,475.

Cost of Living Allowance - Long Term Only

10.5 years of technical services x \$805. 8,452.

Travel and Transportation 105,450.

Post assignment and return Home of 5 LT technicians and dependents at \$8,000 per technician (Shipment of PVO and HHE) 40,000.

Tickets: Round trip tickets for 5 LT technicians with 3 dependents = 20 x \$800. 16,000.

Round trip tickets for ST 30 x \$800. 24,000.

Round trip tickets for Research Agronomist/Team Leader and dependents 4 x \$800 (36 m/m) 3,200.

In-country tickets for ST 30 x \$80. 2,400.

In-country tickets for LT 45 x \$80. 3,600.

Per Diem LT Technicians 650 x \$25 16,250.

Per Diem - Short Termers 27,690.

390 days at \$25 per day = \$9,750.

390 days at \$46 per day = \$17,940.

Overhead

30% Field Staff-\$349,749. x .30=\$104,925. \$136,425.
70% Home staff - \$45,000. x .70= 31,500.

Miscellaneous

Medical, communications, reports 8,000.

TOTAL PERSONNEL COSTS \$877,400.

+ Estimated Inflation Cost 10% 87,740.

\$965,140.

Round-off \$965,000.

2. Local Operational CostsLocal Personnel - 1 year

1 Executive Secretary	\$ 8,365.
2 Drivers - \$2,550. ea.	5,100.
	<u>13,465.</u>

Benefits

Social Security, retirement 11% of \$ 13,465.	1,481.
Severance and Vacation Compensation 11%	1,481.
	<u>2,962.</u>

Other CostsMotor Vehicle and Maintenance

Gasoline, spare parts, services and repairs for 5 vehicles \$1,200 ea. vehicle	6,000.
---	--------

Office Supplies

Stationery, ribbons, pencils, small office equipment, miscellaneous	800.
--	------

Other Office Support

Reports, postage, communications	1,000.
----------------------------------	--------

Office Maintenance and Repair

Office machines maintenance and repair parking of official cars, et c.	1,000.
---	--------

One year operational costs	25,227. x
	<u>3</u>
	75,681.
Estimated 10% inflation cost	7,600.
	<u>83,281.</u>
Round-off	\$83,000.

3. Direct Costs (AID financed Equipment, Machinery and Materials)

a. Soybeans

(1) Research

	<u>Quantity</u>	<u>Cost</u>
Pick-ups	3	\$19,500.
Roto Tillers	3	4,500.
Balances	3	1,500.
Desk Calculators	5	1,000.
Plant Threshers	2	1,000.
Grain Dryers	2	4,000.
Ovens	3	2,800.
Expendable Equipment and supplies	Various	<u>6,000.</u>
	Sub-Total:	\$40,300.

(2) Extension

	<u>Quantity</u>	<u>Cost</u>
Motorcycles	36	\$18,000.
Pick-ups	4	26,000.
Two Row Planter	5	15,000.
Single Row Planter	5	2,500.
Expendable Equipment and Supplies	Various	<u>6,000.</u>
	Sub-Total:	\$67,500.
	TOTAL:	<u>107,800.</u>
	Ocean freight and Insurance	<u>15,000.</u>
	Grand Total:	122,800.
	10% allowance for inflation	12,280.
		<u>135,080.</u>
	Round-off	\$135,000. *****

b. Corn

	<u>Quantity</u>	<u>Cost</u>
Pick-ups	20	\$130,000.
4-Wheel Drive vehicle	1	7,000.
Tractors	2	50,000.
Shellers	10	8,000.
Scales - Dial, Hanging 50 Kg. Capacity	10	500.
Harvard Trip Balance Scale	1	60.
N° 4030 Toledo Grain Scale	2	600.
Platform Scales, double	3	1,200.
Moisture Meter (Lab.)	1	600.
Moisture Meter (Portable)	2	400.
Ovens	4	700.
Portable Grain Dryer	1	2,000.
Motor Cycles (90 h.p.)	52	26,000.
Climate Control Unit	1	2,000.
Expendable Materials, supplies & equipment	Various	25,000.
	TOTAL	<u>\$254,060.</u>
	Ocean Freight & Insurance	<u>75,000.</u> \$329,060.
	10% Allowance for Inflation	<u>32,000.</u>
	Round-off	\$361,000. *****

4. Direct Costs (Participants)a. Soybeans

(1) Foreign Academic or Degree Training

<u>#/Disciplines</u>	<u>Degree</u>	<u>Begin</u>	<u>Complete</u>	<u>Time</u>	<u>Cost</u>
1 Plant Breeder	Phd	1/12/77	1/12/80	3 yrs.	\$ 30,000.
3 Production Research	MS	1/12/77	1/12/79	2 yrs.	60,000.
1 Food Processing	MS	1/12/77	1/12/79	2 yrs.	20,000.
1 Production Methods	--	1/ 5/77	1/ 5/78	1 yr.	10,000.
1 Production Economics	MS	1/ 5/77	1/ 5/79	2 yrs.	20,000.
1 Processing Economics	MS	1/ 5/77	1/ 5/79	1 yr.	20,000.
1 Marketing	MS	1/ 5/77	1/ 5/79	2 yrs.	20,000.
					<hr/>
					\$180,000.

(2) Foreign Non-Degree Training

<u>#/Kind of Training</u>	<u>Location</u>	<u>Time</u>	<u>Cost</u>
10 Technical and Economic aspects of Soybean Pro - duction	INTSOY	4 months May/Aug. 1977	\$ 60,000.
10 Soy Production Short course	Brazil	1 month Dec/Jan 1976/77	<u>7,000.</u> \$ 67,000.

(3) In Country Seminars and Short Courses

<u>#/Kind of Training</u>	<u>Location</u>	<u>Time</u>	<u>Cost</u>
60 Various	Various	Various	\$ 50,000.
(3) TOTAL:			\$297,000.
+ Inflation			<u>12,000.</u>
b. <u>Corn:</u>			\$309,000.

(1) Foreign Training

<u>#/Kind of Training</u>	<u>Location</u>	<u>Time</u>	<u>Cost</u>
10 Research Production and Extension	CYMMYT	6 mos.	\$ 50,000.

(2) In-Country Training (Non Degree)

<u>#/Kind of Training</u>	<u>Location</u>	<u>Time</u>	<u>Cost</u>
30 Short course for Mid-level Technicians	PCIM La Molina	May 1977	\$ 18,000.
30 Short course for Mid-level technicians	PCIM La Molina	May 1978	<u>\$ 18,000.</u>
			\$ 36,000.

(3) In-Country Degree Training (UNA)

<u>#/Discipline</u>	<u>Start</u>	<u>End</u>	<u>Cost</u>
1 Soil Fertility	April 1977	April 1979	\$ 10,000.
1 Plant Breeding	April 1977	April 1979	10,000.
1 Production Technology	April 1977	April 1979	<u>10,000.</u>
			\$ 30,000.

(4) TOTAL:	\$116,000.
+ Inflation	<u>3,000.</u>
F. Budget Analysis (GOP)	\$119,000.

1. Soybeans

Personnel costs are based on current salaries and anticipated cost of living increases to 1980. Personnel are grouped by activity and represent new personnel to be hired or contracted for the project as follows:

Salaries and Benefits

(US\$000)

Professional Level	1977		1978		1979		1980		TOTAL
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	
<u>Extension</u>									
Agronomist	7	33.6	9	48	9	52.8	9	52.8	187.2
Mid-Level Technicians	19	41.0	36	108	36	129.6	36	129.6	408.2
Secretaries	4	8.5	4	10.6	4	12.8	4	12.8	44.7
<u>Research</u>									
Agronomist	8	44.8	8	49.9	8	53.3	8	53.3	201.3
Mid-Level Technicians	7	14.9	7	18.6	7	24.4	7	24.4	82.3
Secretaries	7	14.9	7	18.6	7	24.4	7	24.4	82.3
Workers	52	<u>72.4</u>	71	<u>80.4</u>	71	<u>90.4</u>	71	<u>90.4</u>	<u>333.6</u>
		230.1		334.1		387.7		387.7	
Total Salaries & Benefits:									\$1,339.6

Administrative Office Support Costs

Estimated 10% of Salaries

\$134,000

TOTAL:

\$1,473.6

Vehicle Operation & Maintenance

17 Pick-ups	\$2,250/year	for 4 years	\$ 153,000
36 Motor Cycles	200/year	for 4 years	<u>28,800</u>
			\$ 181,800
Total Personnel & Support Costs:			\$1,655,400

Credit Requirements

1977	8,000 Hectares	\$400	=	\$ 3,200,000
1978	15,000 Hectares	\$440	=	\$ 6,600,000
1979	20,000 Hectares	\$480	=	\$ 9,600,000
1980	34,000 Hectares	\$520	=	<u>\$17,680,000</u>
TOTAL:				\$37,080,000

2. Corn

a. Personnel

Costs outlined below are based on salaries of professional personnel and secretaries but do not include wage field labor.

	(US\$ 000)							
	1977		1978		1979		1980	
	<u>Person.</u>	<u>Cost</u>	<u>Person.</u>	<u>Cost</u>	<u>Person.</u>	<u>Cost</u>	<u>Person.</u>	<u>Cost</u>
Agronomists	17	93.3	17	104	19	114.9	19	126.3
Technicians	35	81.0	52	110.9	64	150.0	71	182.4
Secretaries	7	<u>14.9</u>	7	<u>16.3</u>	8	<u>10.4</u>	8	<u>22.8</u>
TOTAL:		189.2		231.2		275.3		331.5

TOTAL ALL YEARS: \$1,027,200

b. Administrative Support

103,000

c. Support Costs:

Vehicle Operation and Maintenance

17 Pick-ups	\$2,250/year	for 4 years	\$ 153,000
40 Motor Cycles	\$ 200/year	for 4 years	32,000
			<hr/>
			\$ 185,000

d. Labor Costs:

100 Laborers	\$2,500/year	for 4 years	\$1,000,000
TOTAL PERSONNEL AND SUPPORT COSTS:			\$2,315,200

e. Seed:

Seed production and distribution costs are estimated at S/.10,000/Ha. which does not include labor and management costs subsumed under other headings. The seed production schedule and approximate costs are:

Years	1977	1978	1979	1980
Hectares	300	450	800	600
Cost S/.	3,000,000	4,500,000	8,000,000	6,000,000
Cost \$	67,000	100,000	177,000	133,000

Total All Years = \$477,000

Less Return on Corn Sales 101,000

TOTAL COST: \$376,000

DIRECT COSTS

GOP Budget

For Corn and Soybeans

\$000

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Soybean Personnel	230.1	334.1	387.7	387.7
Soybean Admin. Support Costs	25.0	34.0	37.0	38.0
Soy Vehicle Maintenance & Operation	45.4	45.4	45.5	45.5
Corn Personnel	439.2	481.2	525.3	581.5
Corn Administrative Support Cost	19.0	23.0	29.0	32.0
Corn Vehicle Maintenance & Operation	46.2	46.2	46.3	46.3
Corn Seed	53.0	80.0	140.0	103.0
	<hr/>	<hr/>	<hr/>	<hr/>
TOTAL ANNUAL COSTS:	857.9	1,043.0	1,210.8	1,234.0

TOTAL FOUR YEAR COST: \$4,346,600

SOYBEAN SEED PRODUCTION PLAN

<u>Year</u>	<u>Location</u>	<u>Ha./Kg.</u>	<u>Seed Classification</u>	<u>End Use</u>
1976	Chiclayo	7,000	Foundation (Improved Pelican)	3500 to Bagua 3500 to Piura to produce official seed
1976	La Molina	6 = 8,800	Foundation (Jupiter 4000) (Imp.Pel. 4800)	4000 to Huacho 4800 to Cañete to produce official seed
1976	Bagua	35 = 49,000	Official (Imp. Pel.)	To plant 900 ha. commercial Seed in Bagua
	Piura	35 = 49,000	Official (Imp. Pel.)	To plant 700 ha. commercial and 200 Ha. foundation in Bagua and Chiclayo.
1976/77	Huacho	80 = 120,000	Official (Imp. Pel.)	To plant 2400 Ha. commercial in Bagua, San Martin
1976/77	Cañete	95 = 142,000	Official (Jupiter)	To plant 2500 ha. commercial and 340 Ha. foundation seed.
1977	Total available Seed (Commercial & Foundation)			7,560,000 Kgs.
	Sufficient to Plant 14,190 hectares at 55 Kg./Ha.			

SOYBEAN PRODUCTION TARGETS

L O C A T I O N	Y E A R S			
	1977	1978	1979	1980
Bagua-Jaen	5,000	6,000	10,000	15,000
	1,500	1,550	1,600	1,600
	7.5	9.3	16	24
Tarapoto-Juanjui -Tingo María	2,000	5,000	10,000	15,000
	1,600	1,650	1,700	1,750
	3.2	8.2	17	26.25
San Ramón-Satipo	1,000	1,500	2,000	4,000
	1,300	1,350	1,400	1,450
	1.3	2.025	2.8	5.8
TOTAL: Hectares	8,000	12,500	22,000	34,000
Production	12.0	19.52	35.8	56.05 ^{1/}

^{1/} Using simple, not weighted average. Actual project target is 54,000 MT or 50,000 total increase.

SOYBEAN PERSONNEL, LOCATIONS AND COSTS

Location Function	1977		1978		1979		1980	
	No. Type	Cost (S/000)	No. Type	Cost (S/000)	No. Type	Cost (S/000)	No. Type	Cost (S/000)
<u>Bagua/Extension</u>								
Agronomists	2	432	2	480	2	528	2	528
Technicians	6	576	10	1,200	10	1,440	10	1,440
Secretaries	1	96	1	120	1	144	1	144
<u>Tocache, Aucayaucu Campanilla/Extension</u>								
Agronomists	3	648	3	720	3	792	3	792
Technicians	9	864	12	1,440	12	1,728	12	1,728
Secretaries	2	192	2	240	2	288	2	288
<u>Juanjui-Tarapoto Extension</u>								
Agronomists	0	0	2	480	2	528	2	528
Technicians	0	0	8	960	8	1,152	8	1,152
Secretaries	0	0	1	10	1	12	1	12
<u>Satipo-San Ramon Extension</u>								
Agronomists	1	216	2	480	2	528	2	528
Technicians	4	384	6	720	6	864	6	864
Secretaries	1	96	1	120	1	144	1	144
<u>Chiclayo/Research</u>								
Agronomists	2	504	2	552	2	552	2	552
Technicians	2	192	2	240	2	240	2	240
Secretaries	2	192	2	240	2	240	2	240
Workers	16	691.2	16	768	16	768	16	768
<u>Tarapoto/Research</u>								
Agronomists	2	504	2	552	2	552	2	552
Technicians	2	192	2	240	2	240	2	240
Secretaries	2	192	2	240	2	240	2	240
Workers	16	691.2	16	768	16	768	16	768

SOYBEAN PERSONNEL, LOCATIONS AND COSTS

- 2 -

Location Function	1977		1978		1979		1980	
	No. Type	Cost (S/000)	No. Type	Cost (S/000)	No. Type	Cost (S/000)	No. Type	Cost (S/000)
<u>La Molina/Research</u>								
Agronomists	1	252	1	276	1	276	1	276
Technicians	1	96	1	120	1	120	1	120
Secretaries	1	96	1	120	1	120	1	120
Workers	8	345.6	8	384	8	384	8	384
<u>San Ramon/Research</u>								
Agronomists	1	252	1	276	1	276	1	276
Technicians	1	96	1	120	1	120	1	120
Secretaries	1	96	1	120	1	120	1	120
Workers	12	528.4	12	576	12	576	12	576
<u>IIAI/Processing Re- search</u>								
Food Technic.	1	300	1	300	1	300	1	300
Secretary	1	96	1	120	1	120	1	120
Workers	2	86.4	2	96	2	96	2	96
TOTAL:	103	8,896.8	124	13,078	124	14,256	124	14,256

FLOURY CORN PROGRAMACTIVITY SCHEDULE

DEPARTMENTS	1977	1978	1979	1980
Ancash	Extension Demonstration Research	Extension Demonstration Research	Extension Demonstration Research	Extension Demonstration Research
Cuzco	Extension Demonstration Research	Extension Demonstration Research	Extension Demonstration Research	Extension Demonstration Research
Junin	Demonstration Research	Extension Demonstration Research	Extension Demonstration Research	Extension Demonstration Research
La Libertad	Research	Demonstration Research	Extension Demonstration Research	Extension Demonstration Research
Cajamarca	Demonstration Research	Demonstration Research	Demonstration Research	Extension Demonstration Research
Ayacucho	Research	Research	Demonstration Research	Demonstration Research
Apurimac	Research	Research	Research	Demonstration Research
Huancavelica	Research	Research	Research	Demonstration Research

FLOURY CORN PROGRAM
LOCATION OF ACTIVITIES WITHIN DEPARTMENTS

DEPARTMENTS	1977	1978	1979	1980
ANCASH	Huaylas Yungay Carhuas	Huaylas Huaraz Yungay Recuay Carhuas	Huaylas Yungay Carhuas	Huaylas Yungay Carhuas
CUSCO	Urubamba Anta Calca Cusco	Urubamba Anta Calca Canchis Cusco	Urubamba Anta Paucartambo Calca Canchis Cusco Acomayo	Urubamba Anta Paucartambo Calca Canchis Cusco Acomayo
JUNIN	Huancayo Tarma Concepcion Jauja	Huancayo Tarma Concepcion Jauja	Huancayo Tarma Concepcion Jauja	Huancayo Tarma Concepcion Jauja
LA LIBERTAD	Huamachuco	Huamachuco Sant. de Chuco Otuzco	Huamachuco Santiago de Chuco Otuzco	Huamachuco Santiago de Chuco Otuzco
CAJAMARCA	Cajamarca Cajabamba Contumaza	Cajamarca Chota Cajabamba Hualgayoc Contumaza	Cajamarca Chota Cajabamba Hualgayoc Contumaza Cutervo	Cajamarca Chota Cajabamba Hualgayoc Contumaza Cutervo
AYACUCHO	Huamanga Huanta	Huamanga Huanta Cangallo	Huamanga La Mar Huanta Cangallo	Huamanga La Mar Huanta Cangallo
APURIMAC	Andahuaylas	Andahuaylas Abancay	Andahuaylas Abancay	Andahuaylas Abancay
HUANCAVELICA	Tayacaja	Tayacaja Acobamba	Tayacaja Huancavelica Acobamba Angaraes	Tayacaja Huancavelica Acobamba Angaraes

FLOURY CORN PROJECT
SEED PRODUCTION TARGETS
(Hectares)

Departments	1977	1978	1979	1980
Ancash	100	150	200	100
Cuzco	100	150	200	100
Junin	100	150	200	100
La Libertad	-	-	100	100
Cajamarca	-	-	100	100
Ayacucho	-	-	-	100
Apurimac	-	-	-	-
Huancavelica	-	-	-	-
Total	300	450	800	600

FLOURY CORN PROJECT
CORN PRODUCTION TARGETS
(Hectares)

Departments	1977	1978	1979	1980
Ancash	-	4,000	8,000	12,000
Cuzco	-	4,000	8,000	12,000
Junin	-	4,000	8,000	12,000
La Libertad	-	-	-	4,000
Cajamarca	-	-	-	4,000
Ayacucho	-	-	-	-
Apurimac	-	-	-	-
Huancavelica	-	-	-	-
Total	-	12,000	24,000	44,000

FLOURY CORN PROJECT
PERSONNEL REQUIREMENTS BY DEPARTMENTS

Annex B Page 20

DEPARTMENTS	1977		1978		1979		1980	
	Agronomists	Technicians	Agronomists	Technicians	Agronomists	Technicians	Agronomists	Technicians
ANCASH	1 Mal Paso 1 Carhuas 1 Huaráz	4 Mal Paso 3 Carhuas 2 Huaráz	1 Mal Paso 1 Carhuas 1 Huaráz	4 Mal Paso 4 Carhuas 4 Huaráz	1 Mal Paso 1 Carhuas 1 Huaráz	4 Mal Paso 5 Recuay 4 Carhuas 4 Huaráz	1 Mal Paso 1 Carhuas 1 Huaráz	4 Mal Paso 1 Recuay 4 Carhuas 1 Aija 4 Huaráz
CUZCO	1 Valle Sagrado 1 Cuzco 1 Acomayo	4 Valle Sagrado 2 Anta Cuzco 1 Acomayo	1 Valle Sagrado 1 Cuzco 1 Acomayo	4 Valle Sagrado 4 Anta Cuzco 4 Acomayo	1 Valle Sagrado 1 Cuzco 1 Acomayo	4 Valle Sagrado 4 Anta Cuzco 1 Sicuani 4 Acomayo 1 Paucartambo	1 Valle Sagrado 1 Cuzco 1 Sicuani	4 Valle Sagrado 4 Anta Cuzco 1 Sicuani 4 Acomayo 1 Paucartambo
JUNIN	1 Huancayo 1 Sicaya	3 Huancayo 3 Sicaya	1 Huancayo 1 Sicaya	4 Huancayo 4 Sicaya	1 Huancayo 1 Sicaya	4 Huancayo 4 Sicaya	1 Huancayo 1 Sicaya	4 Huancayo 4 Sicaya
LA LIBERTAD	1 Huamachuco	2 Huamachuco	1 Huamachuco	2 Huamachuco	1 Huamachuco 1 Stgo. de Chuco	2 Huamachuco 2 Stgo. de Chuco 2 Otuzco	1 Huamachuco 1 Stgo. de Chuco	2 Huamachuco 2 Stgo. de Chuco 2 Otuzco
CAJAMARCA	1 Cajamarca 1 Chota	2 Cajamarca 2 Chota	1 Cajamarca 1 Chota	2 Cajamarca 2 Cajabamba 2 Chota	1 Cajamarca 1 Chota	2 Cajamarca 2 Cajabamba 1 Condebamba 2 Hualgayoc 2 Chota	1 Cajamarca 1 Chota	2 Cajamarca 1 Cutervo 2 Cajabamba 1 Condebamba 2 Hualgayoc 2 Chota
AYACUCHO	1 Huamanga	2 Huamanga	1 Huamanga	1 Cangallo 2 Huamanga 1 Huanta	1 Huamanga 1 Huanta	1 La mar 2 Huamanga 1 Huanta 1 Cangallo	1 Huamanga 1 Huanta	1 La mar 2 Huamanga 2 Huanta 1 Cangallo
APURIMAC	1 Andahuaylas	1 Andahuaylas	1 Andahuaylas	2 Andahuaylas 1 Abancay	1 Andahuaylas	2 Andahuaylas 1 Abancay	1 Andahuaylas	2 Andahuaylas 1 Abancay
HUANCAVELICA	1 Tayacaja	1 Tayacaja	1 Tayacaja	1 Tayacaja 1 Acobamba	1 Tayacaja	1 Tayacaja 1 Acobamba 1 Angaraes	1 Tayacaja	1 Tayacaja 1 Acobamba 1 Angaraes
NATIONAL LEVEL	3 (1 Manager 1 Secretary 1 driver)							

FLOURY CORN PROJECT

1977-80

PERSONNEL BUDGET

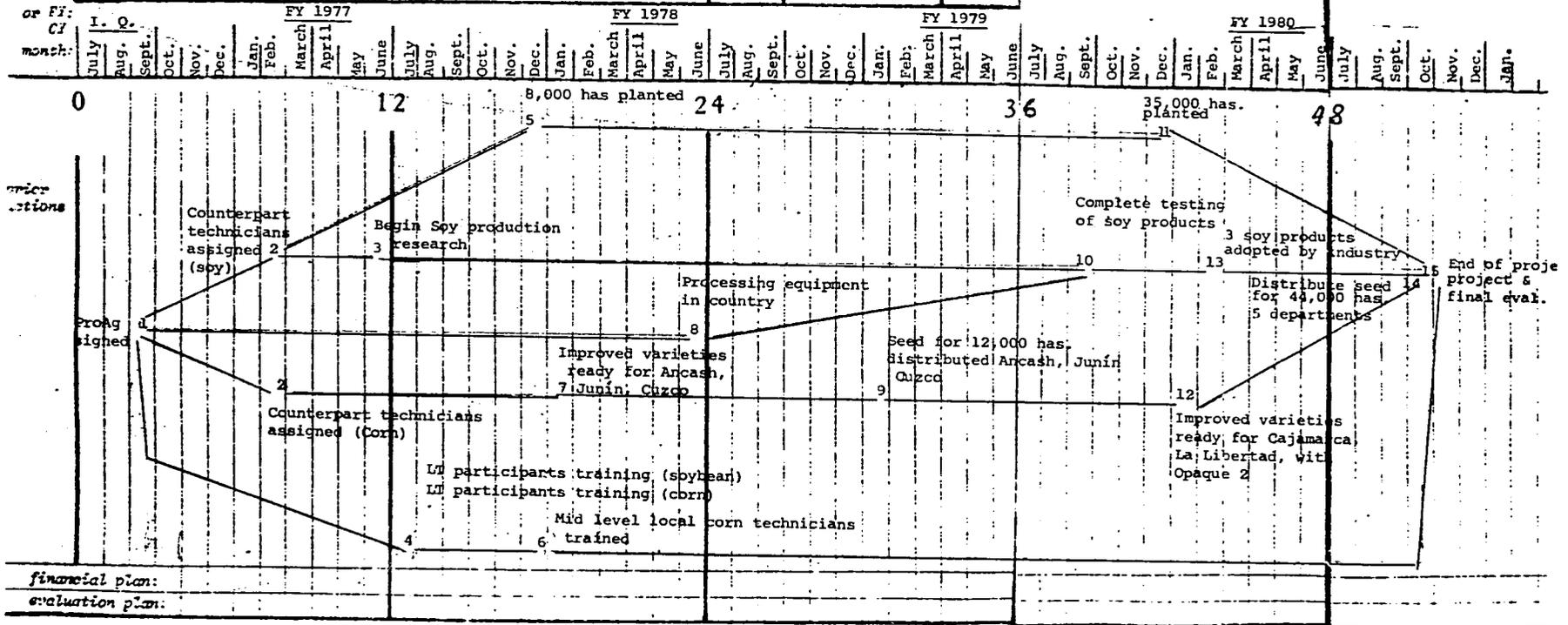
(In Soles)

Departments	1977		1978		1979		1980	
	Agronomist	Technician	Agronomist	Technician	Agronomist	Technician	Agronomist	Technician
Ancash	720,000	864,000	720,000	1'152,000	792,000	1'560,000	792,000	1'680,000
Cuzco	720,000	672,000	720,000	1'152,000	528,000	1'680,000	528,000	1'680,000
Junin	480,000	576,000	480,000	768,000	528,000	960,000	528,000	960,000
La Libertad	240,000	192,000	240,000	192,000	528,000	720,000	528,000	720,000
Cajamarca	480,000	384,000	480,000	576,000	528,000	960,000	528,000	1'200,000
Ayacucho	240,000	192,000	240,000	384,000	264,000	600,000	264,000	720,000
Apurimac	240,000	96,000	240,000	288,000	264,000	360,000	264,000	360,000
Huanavelica	240,000	96,000	240,000	192,000	264,000	360,000	264,000	360,000
National Level	900,000	288,000	900,000	288,000	1'008,000	360,000	1'008,000	360,000
	4'260,000	3'648,000	4'260,000	4'992,000	4'704,000	7'560,000	4'704,000	9'048,000

SAMPLE FORM

ANNEX E
Page 1

country: PERU	project no: 527-15-130-149	project title: Soy and Corn Production on Small Farms	date: / /	/X / original / / revision	PPT appr
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PROJECT PERFORMANCE NETWORK

SAMPLE FORM

<u>country:</u> PERU	<u>project no:</u> 527-15-130-149	<u>project title:</u> Corn and Soy Production on Small Farms	<u>date:</u> / / original / / revision #	<u>approved:</u>
<u>CPI NARRATIVE</u>				
<u>ACTION:</u> <u>AGENT</u>	<u>ACTION (Soybean)</u>	<u>DATE</u>	<u>ACTION</u> <u>AGENT</u>	<u>ACTION (Corn)</u> <u>DATE</u>
MinFood/ AID	1. ProAg signed	9/30/76	MinFood/ AID	1. ProAg signed 9/30/76
MinFood	2. Counterpart technicians assigned	2/28/77	MinFood	2. Counterpart Technicians assigned 2/28/77
DGI	3. Begin Soy production research	6/30/77	MinFood/ AID	4. LT participants in training 7/31/77
DGP	5. 8,000 Has. planted	12/31/77	PCIM	6. Mid-level corn technicians trained 12/31/77
AID	8. Processing equipment in country	6/30/78	DGI-PCIM	7. Improved varieties ready for Ancash, Junín, Cuzco 1/31/78
IIAI	10. Complete Testing Soy products	9/30/79	DGP	9. Seed for 12,000 Has. distributed Ancash, Junín, Cuzco 1/31/79
DGP	11. 35,000 Has. planted	12/31/79		
IIAI	13. 3 Soy products adopted by	2/28/80	DGP	14. Distribute seed for 36,000 Has. 5 departments 9/31/80
USAID	15. End of project	10/31/80	USAID	15. End of project 10/31/80

CHECKLIST OF STATUTORY CRITERIA

(Alliance for Progress)

In the right-hand margin, for each item, write answer or, as appropriate, a summary of required discussion. As necessary, reference the section(s) of the Capital Assistance Paper, or other clearly identified and available document, in which the matter is further discussed. This form may be made a part of the Capital Assistance Paper.

The following abbreviations are used:

FAA - Foreign Assistance Act of 1961, as amended.

FAA, 1973 - Foreign Assistance Act of 1973.

App. - Foreign Assistance and Related Programs Appropriation Act, 1974.

MMA - Merchant Marine Act of 1936, as amended.

BASIC AUTHORITYAnswer or Discussion

1. FAA § 103; § 104; § 105;
§ 106; § 107. *Is loan being made*

a. *for agriculture, rural development or nutrition;*

For agriculture, rural development and nutrition.

b. *for population planning or health;*

c. *for education, public administration, or human resources development;*

d. *to solve economic and social development problems in fields such as transportation, power, industry, urban development, and export development;*

e. in support of the general economy of the recipient country or for development programs conducted by private or international organizations.

COUNTRY PERFORMANCE

Progress Towards Country Goals

2. FAA § 208; § 251(b).

A. Describe extent to which country is:

(1) Making appropriate efforts to increase food production and improve means for food storage and distribution.

(2) Creating a favorable climate for foreign and domestic private enterprise and investment.

The GOP has an active policy to increase food production, including extensive credit programs. A high priority is an attempt to bring additional lands under cultivation. A new Ministry of Food has been established with responsibility for technical assistance in production and marketing of food crops. ENCI and EPSA are operating strongly in the distribution of inputs and marketing of farm products.

In the context of its industrial reform program (Industrial Law) and its balance of payment management, the GOP is seeking foreign and domestic private investments in areas identified as being essential to growth. Also see Item No. 4.

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(3) Increasing the public's role in the developmental process.

(4) (a) Allocating available budgetary resources to development.

(b) Diverting such resources for unnecessary military expenditure (See also Item No. 20) and intervention in affairs of other free and independent nations.) (See also Item No. 11)

(5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.

(6) Adhering to the principles of the Act of Bogota and Charter of Punta del Este.

Programs in Industry (Industrial Law), fishing (Fishing Law), mining (Mining Law), Agrarian Reform, and Social Property are especially designed to achieve this objective, as are efforts to mobilize rural population.

Sizeable portions of the GOP national budget are being allocated to the top priority programs of educational, agricultural and industrial reform (18%, 10% and 5% respectively).

"See item N° 19"

In recent years, tax collections have improved, the rule of law continues to be respected, and land reform has received top priority. Since the recent change of Government, deportees have been invited to return and previously closed newsmagazines been permitted to reopen.

Sound monetary and fiscal policies leading to real growth in GNP, and relatively stable prices, coupled with significant economic and social reforms designed to restructure the Peruvian society along more equitable lines, indicate Peru's compliance with Alliance for Progress goals.

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(7) Attempting to repatriate capital invested in other countries by its own citizens.

Recent decrees requiring full repatriation of foreign capital of Peruvians have had an important impact on the balance of payments and make available resources for investments in Peru.

(8) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

The GOP appears to be responding to the economic, political and social concerns of its people, particularly the poor, and has intensified self-help efforts as indicated above.

B. Are above factors taken into account in the furnishing of the subject assistance?

Yes.

Treatment of U.S. Citizens by Recipient Country

3. FAA § 820(c). If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government?

No known instance.

4. FAA § 820(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?

The Government of Peru is fully aware of USG requirement for prompt, adequate and effective compensation regarding expropriation of U.S. investments. To date there have been several expropriation claims which have been settled to the satisfaction of GOP and the USG. The only outstanding expropriation claim is that of the U.S. Marcona Mining company which is still subject to further negotiations.

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5. FAA § 620(a); Fishermen's Protective Act, § 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing vessel on account of its fishing activities in international waters,

a. Has any deduction required by Fishermen's Protective Act been made?

No deduction has been required.

b. Has complete denial of assistance been considered by A.S.P. Administrator?

The Administrator has taken into consideration prior seizure of U.S. fishing vessels by the GOP in his determination to continue to furnish assistance to Peru. There have been no such seizures or sanctions since the 1972-73 fishing season.

Relations with U.S. Government and Other Nations

6. FAA § 620(2). Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba?

No longer applicable.

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7. FAA § 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement?

Yes.

8. FAA § 620(d). If assistance is for any productive enterprise which will compete in the United States with United States enterprise, is there an agreement by the recipient country to prevent export to the United States of more than 20% of the enterprise's annual production during the life of the loan?

Any production increases resulting from efforts under this project will be consumed or marketed within Peru.

9. FAA § 620(f). Is recipient country No. a Communist country?

10. FAA § 620(i). Is recipient country No. in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression?

11. FAA § 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property?

No.

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13. FAA § 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, in convertibility or confiscation, has the A.I.D. administration within the past year considered denying assistance to such government for this reason?

The Administrator has taken Peru's limited guaranty program into consideration in determining to continue to furnish assistance to Peru.

13. FAA § 620(n). Does recipient country furnish goods to North Viet-Nam or permit ships or aircraft under its flag to carry cargoes to or from North Viet-Nam?

No longer applicable.

14. FAA § 620(q). Is the government of the recipient country in default on interest or principal of any A.I.D. loan to the country?

No.

15. FAA § 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

No.

16. FAA § 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the A.I.D. Administrator in determining the current A.I.D. Operational Year Budget?

In March 1976 State/IO advised the following with respect to Peru's UN obligations: "The amount currently owed by Peru to the UN is not sufficient to trigger the 620(u) provisions." According to State/IO this statement would apply over the next year even if Peru makes no payments to the UN this year.

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17. FAA § 481. Has the government of recipient country failed to take adequate steps to prevent narcotic drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully?

No. The recipient has taken such measures as are within its capacity to control narcotics traffic and is cooperating with U.S. efforts to eliminate production and trade in narcotics.

18. FAA, 1973 § 29. If (a) military base is located in recipient country, and was constructed or is being maintained or operated with funds furnished by U.S., and (b) U.S. personnel carry out military operations from such base, has the President determined that the government of recipient country has authorized regular access to U.S. correspondents to such base?

Not applicable.

Military Expenditures

19. FAA § 620(a). What percentage of country budget is for military expenditures? How much of foreign exchange resources spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Regional Coordinators and Military Assistance Staff (PPC/RC).)

Approximately 15% of the 1975-76 GOP budget was allocated to military expenditures. The widely publicized GOP policy is to seek limitation of armaments throughout Latin America.

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CONDITIONS OF THE LOANGeneral Soundness

20. FAA § 201(d). Information and conclusion on reasonableness and legality (under laws of country and the United States) of lending and relending terms of the loan. Not applicable.
21. FAA § 251(b)(2); § 251(e). Information and conclusion on activity's economic and technical soundness. If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds \$100,000, has country submitted to A.I.D. an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner? For the reason given in the Project Paper the project is considered economically and technically sound.
22. FAA § 251(b). Information and conclusion on capacity of the country to repay the loan, including reasonableness of repayment prospects. Not applicable.
23. FAA § 251(b). Information and conclusion on availability of financing from other free-world sources, including private sources within the United States. The participation of other donors was considered when calculating the amount of AID's contribution to the project.

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24. FAA § 511(a)(1). Prior to signing of loan 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 United States of the assistance?

Yes.

25. FAA § 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 loan?

No such legislative action expected to be necessary.

26. FAA § 511(c). If loan is for technical assistance, and all U.S. assistance to project now exceeds \$1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?

Not applicable.

Loan's Relationship to Achievement of Country and Regional Goals

27. FAA § 507; § 211(a); § 113. Extent to which assistance reflects appropriate emphasis on: (a) encouraging development of democratic, economic, political, and social institutions; (b) self-help in meeting the country's food needs; (c) improving availability of trained manpower in the country; (d) programs designed to meet the country's health needs;

Project activities are designed to meet the objectives of (b) and (c). Improved health (d) should result from consumption of increased food production.

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(c) 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
(f) integrating women into the recipient country's national economy.

28. FAA § 209. Is project susceptible of execution as part of regional project? If so why is project not so executed?

Not susceptible.

29. FAA § 252(b)(3). Information and conclusion on activity's relationship to, and consistency with, other development activities, and its contribution to realizable long-range objectives.

The project will be consistent with other GOP development activities, will contribute to development of the rural sector and is consistent with A.I.D. activities and goals.

30. FAA § 252(b)(7). Information and conclusion on whether or not the activity to be financed will contribute to the achievement of self-sustaining growth.

The promotion of improved corn and soybeans and concomitant assistance to farmers will directly contribute to self-sustaining growth.

31. FAA § 209; § 252(b)(8). Information and conclusion whether assistance will encourage regional development programs, and contribute to the economic and political integration of Latin America.

The relatively small assistance to this project is not expected to have a significant impact on the economic and political integration of Latin America.

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32. FAA § 251(g); § 111. Information and conclusion on use of loan to assist in promoting the cooperative movement in Latin America. Technical assistance will be made available to cooperative-type associations of rural producers and thus contribute to promotion of the cooperative movement.
33. FAA § 251(h). Information and conclusion on whether the activity is consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress in its annual review of national development activities. The IBRD Consultive Group Meeting on Peru emphasized the justifiable need of international financial and technical assistance to Peru's development program.
34. FAA § 281(a). Describe extent to which the loan will contribute to the objective of assuring maximum participation in the task of economic development on the part of the people of the country, through the encouragement of democratic, private, and local governmental institutions. The project is designed to assist small farmers and thus encourage maximum participation at the local level in economic development.
35. FAA § 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. The project contemplates significant involvement and contribution at the small farmer level and therefore strengthens democratic processes at the grass-roots level.

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36. FAA § 601(a). Information and conclusions whether loan 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.

The project is designed to specifically strengthen development and foster initiative of small farmers. It will contribute to improved efficiency in processing industries to meet the country's nutritional needs.

37. FAA § 619. If assistance is for newly independent country; is it furnished through multilateral organizations or plans to the maximum extent appropriate?

Not applicable.

Loan's Effect on U.S. and A.I.D. Program

38. FAA § 251(b)(4); § 102. Information and conclusion on possible effects of loan 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 the U.S. balance of payments position.

In addition to purchases of U.S. goods and services, some grant funds are also provided for minor local costs. These local costs will have negligible effect on the U.S. economy and insignificant adverse effect on U.S. balance of payments.

39. FAA § 252(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.

There will be procurement of supplies and equipment from U.S. and some local Peruvian private sources.

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

"See item No. 38"

41. FAA § 601(d). If a capital project, are engineering and professional services of U.S. firms and their affiliates used to the maximum extent consistent with the national interest?

Not a capital project.

42. FAA § 602. Information and conclusion whether U.S. small business will participate equitably in the furnishing of goods and services financed by the loan.

Information for or about small businesses will be made available in accordance with A.I.D. policies.

43. FAA § 620(h). Will the loan promote or assist the foreign aid projects or activities of the Communist-Bloc countries?

No.

44. FAA § 621. If Technical Assistance is financed by the loan, information and conclusion whether such assistance will be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis. If the facilities of other Federal agencies will be utilized, information and conclusion on

All U.S. goods and services will be procured from the private sector. No utilization of other USG agencies is anticipated.

whether they are particularly suitable, are not competitive with private enterprise, and can be made available without undue interference with domestic programs.

Loan's Compliance with Specific Requirements

45. FAA § 110(a); § 208(e). Has the recipient country provided assurance that it will provide at least 25% of the costs of the program, project, or activity with respect to which the loan is to be made? Yes.
46. FAA § 112. Will loan be used to finance police training or related program in recipient country? No.
47. FAA § 114. Will loan be used to pay for performance of abortions or to motivate or coerce persons to practice abortions? No.
48. FAA § 201(d). Is interest rate of loan at least 2% per annum during grace period and at least 3% per annum thereafter? Not applicable.
49. FAA § 604(a). Will all commodity procurement financed under the loan be from the United States except as otherwise determined by the President? Procurement will be in accordance with A.I.D. grant procurement regulations.
50. FAA § 604(b). What provision is made to prevent financing commodity procurement in bulk at prices higher than adjusted U.S. market price? Not applicable.

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- FAA § 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will loan agreement require that marine insurance be placed in the United States on commodities financed by the loan? Not applicable.
- FAA § 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? Not applicable.
3. FAA § 604(f). If loan finances a commodity import program, will arrangements be made for supplier certification to A.I.D. and A.I.D. approval of commodity as eligible and suitable? Not applicable.
4. FAA § 808(a). Information on measures to be taken to utilize U.S. Government excess personal property in lieu of the procurement of new items. Consideration of excess availabilities will be given at time of procurement.
5. FAA § 811(b); App. § 101. If loan finances water or water-related land resource construction project or program, is there a benefit-cost computation made, insofar as practicable, in accordance with the procedures set forth in the Memorandum of the President dated May 15, 1962? Not applicable.

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56. FAA § 611(c). If contracts for construction are to be financed, what provision will be made that they be let on a competitive basis to maximum extent practicable? Not applicable.
57. FAA § 612(h); § 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 United States are utilized to meet the cost of contractual and other services. No excess U.S. owned foreign currencies are available in Peru. About 40% of direct project costs will be borne by the GOP.
58. FAA § 111. Will any of loan funds be used to acquire currency of recipient country from non-U.S. Treasury sources when excess currency of that country is on deposit in U.S. Treasury? No. Peru is neither an excess nor a near excess currency country.
59. FAA § 615(d). Does the United States own excess foreign currency and, if so, what arrangements have been made for its release? No. U.S. owned excess foreign currencies available.
60. FAA § 620(a). What provision is there against use of subject assistance to compensate owners for expropriated or nationalized property? No such financing contemplated.

AT 1540-2 (8-74)

61. FAA § 620(A). If construction of productive enterprise, will aggregate value of assistance to be furnished by the United States exceed \$100 million?

No.

62. FAA § 636(i). Will any loan funds be used to finance purchase, long-term lease, or exchange of motor vehicle manufactured outside the United States, or any guaranty of such a transaction?

Some motorcycles for use by extension agents are anticipated to be purchased under this grant project. If no motorcycles of U.S. manufacture are available or suitable, a procurement waiver may be requested.

63. App. § 103. Will any loan funds be used to pay pensions, etc., for military personnel?

No.

64. App. § 105. If loan is for capital project, is there provision for A.I.D. approval of all contractors and contract terms?

Any contracts financed by project funds will be subject to AID approval.

65. App. § 107. Will any loan funds be used to pay UN assessments?

Not applicable.

66. App. § 109. Compliance with regulations on employment of U.S. and local personnel. (A.I.D. Regulation 7).

Not applicable.

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67. App. § 130. Will any of loan funds be used to carry out provisions of FAA §§ 209(d) and 251(h)?

68. App. § 114. Describe how the Committee on Appropriations of the Senate and House have been or will be notified concerning the activity, program, project, country, or other operation to be financed by the Loan.

This project was included in the FY 1977 Congressional Presentation.

69. App. § 601. Will any loan funds be used for publicity or propaganda purposes within the United States not authorized by the Congress?

No.

70. MMA § 907.b; FAA § 640C.

(a) Compliance with requirement that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed with funds made available under this loan shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates.

Not applicable.

(b) Will grant be made to loan recipient to pay all or any portion of such differential as may exist between U.S. and foreign-flag vessel rates?

ANNEX II

DRAFT PROJECT DESCRIPTION

The goal of the agricultural sector is to increase productivity, employment, and incomes and improve nutrition among the poor.

This Project will contribute to the goal by establishing the institutional and research bases of long-term growth in the production of two priority crops: soybeans in selected high jungle areas, and floury corn in eight selected provinces of the sierra. By the end of the planned four year project period it is expected that improved, higher yielding varieties of corn will have been planted on approximately 36,000 hectares of land in the sierra and that nutritionally improved corn will have gained acceptance by farmers in at least one sierra province. Also, by the end of the project, soybean plantings should have expanded to 34,000 hectares with total production rising to 54,000 metric tons; based primarily on this production three soybean based food products should have been developed, tested, and introduced to the market in the form of commodities familiar to the poorest elements of the population and within their purchasing capacity.

It is recognized that the critical obstacle to increased production of both soybeans and floury corn is now the lack of sufficient capacity for dissemination of production technology to small farmers. To overcome this prime constraint, the Project will develop integrated extension and research networks, with adequate personnel and equipment to reach the target population and production goals. In addition, the Project will produce: (a) adapted, improved corn seed on a schedule dictated by careful evaluation of each operational area; (b) tested soybean varieties and seed for up to four production zones; (c) technicians trained to carry on research, extension, processing, and agro-economic evaluations beyond the end of the project; (d) annual corn and soybean production plans; (e) consumer tested soybean products and; (f) varieties of corn with characteristics equal to selected traditional varieties but with higher yields.

To accomplish the foregoing, AID will provide up to 155 months of technical assistance as well as extension, research, and processing equipment. AID will also provide training abroad and will sponsor local training in Peru, both academic and short term.

The Ministry of Food will: (a) recruit or contract for the additional professional, clerical, and unskilled personnel required for the execution of the Project; (b) provide for the maintenance of vehicles and equipment supplied under this Agreement; (c) make available to the personnel of the Project, both Peruvian and American, research and extension facilities under its control as required for Project implementation; (d) contract with the Cooperative Corn Improvement Program (PCIM) to provide the bulk of professional personnel required for the corn element of this Project and; (e) furnish salaries for participant trainees while they are in training.

Table 2: Tingo Maria, Aucayacu, Campanilla Possible Crop Combinations on 5 Hectares; Recommended Growing Seasons

PERIOD	CROP	HECTARES								
		0	1	2	3	4	5	0	5	
8 mos. Apr. - Nov.	Tobaco	0	0	0	0	0	0	0	5	0
6 mos. Oct. - Mar.	Rice	5	5	5	5	5	5	5	0	0
6 mos. May - Oct.	Corn	5	4	3	2	1	0	0	0	0
4 mos. June - Sept.	Soybeans	0	1	2	3	4	5	0	0	0
12 mos. May - May x 2	Plantain	0	0	0	0	0	0	0	0	5

* Source MINFOOD Cost of Production Study, Zone IX

Five hectare farm plots are the norm in the jungle areas of Zone IX which are included in the soybean element of this project. This size seems to be the maximum that can be worked by a single farm family using traditional methods, low levels of mechanization, and occasional shared labor during peak seasons such as harvest at current prices and yields. Table 3 shows possible income levels from alternative land-uses in the zone:

Table 3: Net Farm Income From Selected Crop Combinations (Huallaga Central - Bajo Mayo)
Five Hectares

<u>Combination (Hectares)</u>					<u>Income from:</u>					<u>Total Income</u>
<u>R</u>	<u>C</u>	<u>S</u>	<u>T</u>	<u>P</u>	<u>2/</u> Rice	<u>3/</u> Corn	<u>4/</u> Soybeans	<u>5/</u> Tobacco	<u>6/</u> Plantain	
10	0	0	0	0	49,630	0	0	0	0	S/. 49,630 = \$ 1,103
5	5	0	0	0	24,815	52,330	0	0	0	77,145 = 1,714
5	4	1	0	0	24,825	41,864	13,494	0	0	80,183 = 1,782
5	3	2	0	0	24,815	31,398	26,988	0	0	83,201 = 1,849
5	2	3	0	0	24,815	20,932	40,482	0	0	86,229 = 1,916
5	1	4	0	0	24,815	10,466	53,969	0	0	89,250 = 1,983
5	0	5	0	0	24,815	0	67,470	0	0	92,285 = 2,051
0	5	5	0	0	0	52,330	67,470	0	0	119,800 = 2,662
0	0	0	5	0	0	0	0	95,605	0	95,605 = 2,125
0	0	0	0	5	0	0	0	0	132,970	132,570 = 2,954 ^{7/}
0	0	10	0	0	0	0	134,940	0	0	134,940 = 2,989

1/ Source: Cost of Production Analysis, Zone IX Production Office, Aucayacu.

2/ Official Price: S/. 11.50; Yield: 2,500 Kg/Ha.

3/ Official Price: S/. 9.50; Yield: 1,800 Kg/Ha.

4/ Official Price: S/. 17.70 less S/. 2.00 transportation; Yield: 1,550 Kg/Ha.

5/ Current Market Price: S/. 3.50/kg; Yield: 12,000 kg.

6/ Current Market Price: S/. 00.50 per unit at farm gate.

7/ Average of net annual income discounted over a 3 year period. Discounted assuming opportunity cost of capital = 20%

Two crops of soybeans would appear to be the most profitable choice. But, because of probable disease and pest problems, it is not likely to be employed.

It would seem that plantains offer the next best earning potential and this would be true except for marketing and climatological factors. Plantains are relatively perishable and must be marketed in local population centers or, at best, in nearby mountain areas. In both places, markets are limited and EPSA does not intervene. Occasionally, winds of great force destroy or damage plantations in the zone, plantains with their weak root systems being particularly susceptible. Further, it is financially difficult for a poor family to make the first year investment of time, land and money in plantain production. That year requires 70% of the total two year cost and about 67% of the two year labor requirement while returning only 40% of the bi-annual income. These problems restrain investment in production and plantains compete only at the margin in the zone.

The third best income earner would be corn and soybeans in rotation. This alternative will be feasible in part of the zone. Tobacco will, as the fourth most profitable crop, be grown by farmers with a combination of capital and suitable land but will be limited by lack of credit while the fifth most profitable choice -- rice and soybeans in rotation -- will probably be most widely practiced since rice is a dominant crop on the soils most suitable for soybean production i.e., the more level lands.

A farmer who now plants two crops of rice (= 10 Ha.) each year will have an opportunity to increase his income by 76% (from S/. 49,630 to S/. 92,285) by rotating rice with soybeans while a farmer who now depends on two corn crops could improve the family income by 14% (from S/. 104,660 to S/. 119,800 through a rotational soybean crop while adding valuable nitrogen to the soil for succeeding crops.

In terms of returns to family labor the five crops perform as shown below in Table 4. Returns per hectare/month appear in Table 5.

Table 4: Returns to Days of Labor Selected Crops, Zone IX

Crop	Days of ^{1/} Labor / Ha.	Net Returns /Ha.	Returns to one day of labor
Plantain	53 ^{2/}	26,954 ^{2/}	502 ^{2/}
Rice (mechanized)	12	4,963	414
Soybeans	43	13,494	314
Corn	29	10,466	361
Tobacco	124	19,121	154

^{1/} Source: DGP Cost of Production Data

^{2/} Two year average

Table 5: Returns to Hectare Months

Crop	Occupied Hectares		Crop Length	Ha. Months	Net Returns	Returns per Month
Rice	5	x	4	20	49,630	S/. 2,481. = \$55.13
Plantain	5	x	12	60	134,770	2,276. = 49.91
Soy	5	x	4	20	67,470	3,373. = 74.96
Corn	5	x	6	30	52,330	1,744. = 38.76
Tobacco	5	x	8	40	95,605	2,390. = 53.11

Thus, soybeans are seen to return more per unit of time and land than other crops in the zone.

B. Financial Analysis Zone II (Bagua)

Bagua is an area of low rainfall where cultivation depends on irrigation water from rivers and is largely confined to valley floors where such water is plentiful, year-round. As such, the area has specialized in rice production, producing two crops a year until recently when the government was forced to discourage officially the second crop on most of the land because of disease build-up.

Since then, farmers have sought a viable rotation crop. Both corn and soybeans have been tried, along with several varieties of edible beans. But until EPSA entered the picture as a buyer of soybeans at an attractive price, corn was the only available alternative crop with a firm market.

As in Zone IX farm sizes average about five hectares, machinery is severely limited and animals provide the main power source. Rice is cultivated under a transplanting system which is labor-intensive and yields a respectable 5,000 Kg/Ha, making it by far the most profitable crop of the area. There are 13,404 hectares of rice in the major harvest whereas corn, the second most popular crop, is planted on 3,915 hectares as a second crop. DGP agents in the zone estimate that at present levels of expected income soybeans could be planted on about 9,000 hectares. This is borne out by the fact that, during April, 35 hectares of soybean seed were planted by groups of farmers interested in trying a rotation soybean crop in August, 1976. This seed propagation was assisted by an INTSOY technician working under AID sponsorship and will be the basis for the first pilot soybean production campaign of 1,000 hectares or more.

Crops grown in the Bagua area include, in addition to rice and corn, casava, banana, various tubers, and beans of several kinds, all planted in insignificant amounts for local consumption. Rice and corn are the only truly commercial crops and soybeans will have to compete only with corn as a second crop on the available 14,172 hectares of irrigated land. The traditional rice growing season is from March through July with a second, smaller rice crop from August through January. This crop is now forbidden in most of the zone and corn has entered in its place. Soybeans are seen as a potential income earner on land not now cropped twice a year, though soybeans will not necessarily displace corn where it already has been introduced.

There are essentially two alternative crops mixes to be examined for potential financial returns to Bagua farmers.

These are rice and soybeans in rotation and corn and soybeans in rotation. The possibility of double cropping rice has been eliminated by government edict because of disease problems. The costs and returns to capital and labor for each major crop are summarized below:

Table 6: Costs and Returns for One Hectare of Rice, Corn and Soybeans

Crop	Direct Costs ^{2/}	Interest	Bagua 1975 ^{1/} Value of Production	Net Returns	Days Labor	Returns to Labor/Day
Rice	S/.14,056	492	S/.57,500 ^{3/}	S/. 42,952.	137	S/. 313.
Corn	11,988	419	25,760 ^{4/}	13,353	49	273.
Soybean	8,497	248	23,550 ^{5/}	14,805	49	302.

^{1/} Source: DGP Cost of Production Data

^{2/} Labor and Inputs

^{3/} 5,000 kg. at S/. 11.50/Kg.

^{4/} 2,800 kg. at S/. 9.20/Kg.

^{5/} 1,500 kg. at S/. 15.70/Kg.

There is little financial difference between corn and soybeans as a second crop in the Bagua area except that soybeans require relatively less investment primarily because of higher fertilizer requirements for corn production -- corn requires S/. 5,000 in fertilizers whereas soybeans use only S/. 1,485. in this expense category.

The critical choice will therefore be made on the basis of crop adaptability to the soils and conditions of each farm, availability of inputs, subjective preferences of individual farmers, and the length of crop cycles taking into account the needs of the rice crop.

Corn has not answered most farmers needs for a rotation crop in Bagua. According to DGP personnel in the area, the longer growing season of six months crowds the rice planting season for most

farmers because few tractors are available to help reduce soil preparation times. Soybeans, however, are a short season crop which allows more time for soil preparation before rice planting. Moreover the farmers are aware of the nitrogen-fixing capability of soybeans and favor them as an aid to more profitable rice production. Only low prices, lack of seed and inputs, and absence of technical knowledge have prevented the earlier entry of soybeans into the area in a major way. Higher prices have created considerable enthusiasm for planting soybeans on land that would otherwise be left fallow and would increase the farm income by 34% from S/. 214,760 (\$ 4,772.) to S/. 288,758 (= \$ 6, 417.). Soybeans used in rotation with corn would increase farm incomes by more than 100% on land that produces only one corn crop each year. On land that now produces two corn crops soybeans would produce five percent more direct income, help reduce disease and pest problems, and make a significant contribution of nitrogen to succeeding crops.

Moreover, the returns to land stated in income per hectare per month decidedly favor soybeans, which yield S/. 3,701 (= \$ 82.25), as opposed to corn which produced S/. 2,226 (= \$ 49.46) per hectare month. Soybeans provide slightly more income than corn in two thirds the time required for that crop.

Mechanization

Even with non-mechanized practices the few farmers who have had experience with soybeans express satisfaction with their own ability to manage the crop. The item of equipment most desired is the planter, which is seldom available but can be purchased. Soybeans on small plots are generally harvested by hand with problems no greater than those encountered in other crops. Since stocks and leaves are often used as fodder, carrying them from the field to a shed for hand threshing and winnowing has some financial utility; and since this harvesting method is similar to that used for other crops, farmers perceive no inconvenience, as long as the price of the product is competitive. Mechanization in Peru is an expensive proposition. Acquisition costs are high and equipment life is generally short, because of lack of experience in handling machinery and uncertain supplies of replacement parts. Hence production methods remains unmechanized for all crops, including soybeans.

PART II: CORN DATA TABLES

Table 7: Number, Size and Parcels of Agricultural Units by Size Category in Cajamarca, Ancash, Cuzco in 1972

Size in Hectares of Agricultural Units	Total Units Surveyed No. and % Extension of Land		Parcels	
			Average Per Unit	Hectares Per Parcel
<u>CAJAMARCA (Entire Department)</u>				
Absolute data	160,776	1,729,526 Has.		
Less than 1	19.8%	0.6%	0.37	
1 - 2	15.2	1.8	1.91	.66
2 - 3	11.9	2.5	2.19	1.01
3 - 4	9.5	2.8	2.35	1.35
4 - 5	<u>7.2</u>	<u>2.8</u>	2.46	1.69
	63.6%	10.5%		
5 - 500	36.3	55.0	2.64	6.16
Greather than 500	0.1	34.5	2.18	1,739.17
TOTAL	100.0%	100.0%	-	-

Size in Hectares of Agricultural Units	Total Units Surveyed		Parcels	
	N° and %	Extension of Land (%)	Average Per Unit	Hectares Per Parcel
<u>ANCASH (Entire Department)</u>				
Absolute Data	109,619	1,029,323 Has.		
Less than 1	41.7%	1.6%	0.39	
1 - 2	22.6	3.3	3.54	.38
2 - 3	12.9	3.2	4.12	.56
3 - 4	7.8	2.8	4.29	.76
4 - 5	<u>4.2</u>	<u>1.9</u>	4.62	.93
	89.2%	12.8%		
5-500	10.7	17.6	4.63	3.32
Greater than 500	0.1	69.6	3.23	1,826.47
Total	100.0	100.0	-	-
<u>CUZCO (Entire Department)</u>				
Absolute Data	123,299	2,133.334 Has.		
Less than 1	50.2%	1.2%	0.42	.24
1 - 2	20.8	1.7	4.36	.31
2 - 3	8.6	1.2	4.33	.54
3 - 4	4.6	0.9	3.96	.84
4 - 5	<u>2.6</u>	<u>0.7</u>	3.64	1.17
	86.8%	5.7%		
5-500	12.7	23.7	2.51	12.84
Greater than 500	0.5	70.6	2.36	1,134.08
Total	100.0%	100.0%	-	-

Source: 1972 Agricultural Census: Unpublished data from Oficina Nacional de Estadísticas y Censos (ONEC)

Table 8 Sources of Farm Labor Sierra Cajamarca, Ancash, Cuzco

Size Category	Total	<u>Labor Form in Percent</u>			Undeclared
		Producer and Unpaid Labor	With Part/Time Labor	With Permanent Labor	
				<u>Total Sierra</u>	
1. Number of Units	1,083,066	40.0	29.3	1.0	21.7
2. Less than 1 hectare	403,325	28.0	13.2	0.3	58.5
3. 1 - 5	480,884	60.4	38.8	0.6	0.2
4. 5 - 500	195,114	58.0	39.3	2.6	0.1
5. Greater than 500	3,294	40.7	30.7	27.7	0.9
				<u>Cajamarca (Sierra only)</u>	
1. Numer of Units	123,633	51.4	32.2	0.7	15.7
2. Less than 1 Hectare	28,316	21.6	9.7	0.2	68.5
3. 1 - 5	5,556	62.1	37.3	0.5	0.1
4. 5 - 500	39,636	57.5	41.1	1.3	0.1
5. Greater than 500	106	18.9	45.2	34.0	1.9
				<u>Ancash (Sierra only)</u>	
1. Number of Units	100,067	39.0	30.7	0.7	29.6
2. Less than 1 Hectare	42,988	19.9	11.3	0.2	68.6
3. 1 -5	47,421	55.4	43.8	0.6	0.2
4. 5 - 500	9,535	43.7	53.9	3.2	0.2
5. Greater than 500	107	29.0	48.6	21.9	0.5

Size Category	Total	<u>Labor Form in Percent</u>			
		Producer and Unpaid Labor	With Part/Time Labor	With Permanent Labor	Undeclared
					<u>Cuzco (Sierra only)</u>
1. Number of Units	112,405	40.4	32.0	0.9	26.7
2. Less than 1 Hectare	60,360	29.3	20.6	0.2	49.9
3. 1 - 5	41,325	51.7	49.0	0.2	0.1
4. 5 - 500	10,176	60.0	34.8	5.1	0.1
5. Greater than 500	538	32.2	32.3	35.1	0.4

Source: ONEC, Note that the undeclared category represents labor for which interviewers were unable to account and is attributed to unpaid family labor or labor exchanges.

Table 9: Energy Source for Agricultural Production in Peru, Cajamarca, Ancash and Cuzco by Size Category (Sierra only).

Size Category	Total Units Surveyed	Human Only	Energy Source (%)			Undeclared
			Animal	Mechanical	Mechanical & Animal	
<u>Peru (Sierra)</u>						
Total	100.0	22.9	52.8	.3	2.1	21.9
Less than 1 Ha.	100.0	16.9	23.7	.1	.8	58.5
1 - 5	100.0	.3	.7	.3	2.7	2
5 -20	100.0	25.6	71.1	.4	2.7	.1
20 -100	100.0	39.2	56.5	1.1	3.1	.1
100 -500	100.0	62.6	31.6	2.1	3.4	.3
Greater than 500	100.0	61.8	26.2	4.8	6.0	1.2
<u>Cajamarca (Sierra)</u>						
Total	100.0	9.2	74.5	.1	.4	15.8
Less than 1 Ha.	100.0	5.3	26.1	*	.1	68.5
1 - 5	100.0	10.1	89.4	.1	.3	.1
5 -20	100.0	10.2	89.1	.1	.5	.1
20 -100	100.0	12.6	85.6	.7	1.0	.1
100 -500	100.0	17.2	78.0	2.2	2.0	.6
Greater than 500	100.0	31.1	40.6	12.3	14.2	1.8
<u>Ancash (Sierra)</u>						
Total	100.0	5.9	64.1	*	.4	29.6
Less than 1 Ha	100.0	3.5	27.7	*	.2	68.6
1 - 5	100.0	7.7	91.6	*	.4	.2
5 -20	100.0	6.5	92.5	-	.9	.1
20 -100	100.0	11.4	84.9	.8	2.6	.3
100 -500	100.0	22.8	70.5	.5	5.2	1.0
Greater than 500	100.0	27.1	63.6	-	5.6	3.7
<u>Cuzco (Sierra)</u>						
Total						
Less than 1 Ha.	100.0	33.9	37.3	.3	1.6	26.9
1 - 5	100.0	21.8	27.3	.1	.8	50.0
5 -20	100.0	42.4	55.1	.2	2.2	.1
20- 100	100.0	65.7	29.6	.9	3.6	.2
100 - 500	100.0	77.4	16.2	2.4	3.7	.3
Greater than 500	100.0	69.7	21.2	3.5	4.8	.8

* Less than 0.1

Source: ONEC

Table 10: Percent of Units That Use Commercial Fertilizer on Corn Crops in Peru, Cajamarca, Ancash and Cuzco by Size Category

	<u>Hectare Category</u>				Total
	Less than 1	1 - 5	More than 5	Undeclared	
<u>Peru (Sierra only)</u>					
Number of Units	403,325	480,884	198,408	449	1,083,066
Grain Corn	2.0%	3.7%	2.5%	-	2.3
Fresh green corn	0.2	0.3	0.2	-	0.2
<u>Cajamarca (Sierra Only)</u>					
Number of Units	28,316	55,560	39,742	15	123 633
Grain Corn	0.2	0.7	1.0	-	0.7
Fresh Green Corn	0.0	0.0	0.0	-	0.0
<u>Ancash (Sierra Only)</u>					
Number of Units	42,988	47,421	9,642	16	100,067
Grain Corn	0.0	0.0	0.0	-	0.0
Fresh Green Corn	0.2	0.3	0.5	-	0.3
<u>Cuzco (Sierra Only)</u>					
Number of Units	60,360	41,325	10,714		112,465
Grain Corn	3.7	6.8	4.9		4.9
Fresh green corn	0.3	0.5	0.3		0.4

Source: ONEC

Table 11: Percent of Units That Purchase Seed Corn for Planting in Peru, Cajamarca, Ancash, Cuzco by Size Category

	Hectare Category				Total
	Less than 1	1 - 5	More than 5	Un- clared	
	<u>Peru (Sierra only)</u>				
Number of Units	403,325	408,884	198,408	449	1,083,066
Purchase for Grain Corn	2.2	4.8	3.36	-	3.6
Purchase for Choclo	0.2	0.3	0.2	-	0.2
	<u>Cajamarca (Sierra only)</u>				
Number of Units	28,316	55,560	39,742	15	123,633
Purchase of Grain Corn	3.6	8.5	6.1	-	6.3
Purchase for Choclo	0.4	0.7	0.3	-	0.5
	<u>Ancash (Sierra only)</u>				
Number of Units	42,988	47,421	9,642	16	100,067
Purchase for Grain Corn	1.7	3.5	6.1	-	4.7
Purchase for Choclo	0.1	0.2	0.5	-	1.3
	<u>Cuzco (Sierra only)</u>				
Number of Units	60,360	41,325	10,714	6	112,405
Purchase for Grain Corn	2.8	4.6	3.7	-	3.6
Purchase for Choclo	0.2	0.2	0.2	-	0.2

Source: ONEC

Corn is a major crop throughout the sierra, representing a substantial portion of the total annual crop in all farm-size categories including those under one hectare as illustrated below:

Table 12: Corn as Percentage of Total Land Devoted to Annual Crops by Farm Size, Cajamarca, Ancash and Cuzco

	Less than 1 Ha.	1 - 5	5 +
	<u>Cajamarca</u>		
Total Annual Crop (Ha.)	11,618	81,603	161,991
Total Corn (Ha.)	3,324	53,846	69,193
% Land in Corn	28%	66%	43%
	<u>Ancash</u>		
Total Annual Crop	6,883	73,248	61,732
Total Corn	2,323	20,038	18,950
% Land in Corn	34%	27%	31%
	<u>Cuzco</u>		
Total Annual Crop	12,060	39,645	33,011
Total Corn	4,345	11,134	6,499
% Land in Corn	36%	28%	19%

Source: ENCA

As shown in the following table, the principal use of corn is for home-consumption. To an extent greater than for any other food item it is both produced and consumed by the same family.

Table 13: Consumption and Origin of the Principal Food Products in the Sierra of Peru

	Consumption in Kilo per capita					
	North		Central		South	
	Total	Percent Home Produced	Total	Percent Home Produced	Total	Percent Home Prod
White potato	102.175	70.38	138.294	87.93	170.824	94.27
Yellow potato	4.585	25.32	1.822	68.83	0.024	100.00
Dried potato	0.697	80.92	0.858	69.00	17.992	92.48
Dry Corn	24.758	86.04	31,145	95.37	24.835	80.83
Green Corn	12.871	89.43	11.078	93.37	3.115	83.98
Lima Beans	2.463	59.16	7.406	80.12	14.703	88.52
Quinoa	0.185	41.62	0.319	84.01	14.005	99.05
Fresh milk	12.668	59.63	8.333	59.68	9.231	83.46
Pan Manteca/Yema	9.426	8.09	8.638	2.06	7.763	-
Fresh bread	3.215	5.35	7.823	-	0.042	-
Wheat	8.171	70.67	4.945	84.43	3.744	90.92
Mutton	1.923	32.76	4.619	26.61	5.852	58.35
Casava	18.842	61.24	1.258	6.12	0.217	6.41
Sugar	18.539	-	10.081	-	6.186	-

Source: ENCA

The importance of corn in the sierra diet as opposed to the general diet country-wide is illustrated in Table 14 which indicated its contribution in terms of calories and proteins.

Table 14: Incidence of Corn in National and Rural Sierra Diets*

	Annual Consumption per capita (Kg.)	Daily Equivalent Calories	Proteins (Grams)	Proportion of Total Calories (%)	Proteins (%)
PERU	14.8	106	2.78	5.3	4.7
Rural Sierra	30.9	245	6.43	12.4	12.4
North	34.7	259	6.79	12.4	12.9
Central	35.9	282	7.41	16.6	15.4
South	22.4	198	5.21	9.7	8.3

* Dry and green corn

Source: Havens et.al.

From these data the following picture of the potential beneficiaries of this Project element emerge: The income of the group is \$ 85.00 per capita per year -- an average of the north, south and central sierra. Some of the group receive far less than \$ 85.00 and a few receive far more. In the southern rural sierra, for example, average per-capita incomes are \$ 58.00 per year.

The typical sierra farm family plants corn on about a third of its land. This is greater on farms under five hectares and less on larger farms. However, the smaller the farm area, the more of total income is derived from off-farm activities. The quantity and quality of the diet depends not primarily on cash earnings but on home production. In the south 80% of all food consumed by rural families is grown at home. In the central sierra this figure is 60% and in the north it is 57%. Food accounts for 58.21% to 69.59% of all family expenditures (including home production) in the sierra. It is clear, therefore that even on sub-economic units the farm contributes substantially to family welfare.

ANNEX J

DRAFT PROJECT AUTHORIZATION

PERU

Corn and Soybean Production
by Small Farmers
Project No. 527-15-130-149

Pursuant to the Authority vested in Me as _____, Agency for International Development (A.I.D.) by The Foreign Assistance Act. of 1961, as amended (The "Act"), and Delegations of Authority issued thereunder, I hereby authorize the furnishing of a Grant pursuant to Part I, Chapter I, Section 103 of said Act to the Government of Peru (The "Cooperating Country") of not to exceed Eight Hundred and Forty Thousand United States Dollars (\$840,000) to help in financing certain foreign exchange and local currency costs of goods as described in the following paragraph.

The Project consists of the technical assistance, training, and commodities necessary to achieve long-term growth in the production of improved highland corn and soybeans on small farms in Peru and to increase the direct consumption of soybeans, soybeans products, and nutritionally improved corn by the poorest elements of the Peruvian population.

I hereby authorize incremental funding for this Project. I approve the total level of A.I.D. appropriated funding planned for this Project of not to exceed Two Million Four Hundred Thousand United States Dollars (\$2,400,000) Grant, of which \$2,400,000 will be Grant funded, including that authorized above, during the period FY "TQ" through FY 1980. I therefore authorize the funding of additional increments during the period of Grant Funding up to \$1,560,000, subject to the availability of funds in accordance with A.I.D. allotment procedures.

I hereby authorize the initiation of negotiations for execution of the Project Agreement that will be subject to the following terms, covenants and conditions:

a. Source and Origin of Good and Services

Goods and Services financed by A.I.D. under this Project shall have their source and origin in the Cooperating Country or in the United States, with the exception of motorcycles which, upon processing and approval of appropriate waiver documentation, may be obtained from countries included in A.I.D. Geographic Code 899.

b. Prior to any disbursement under the Project Agreement to finance goods or services for the corn element of the Project, the Grantee shall furnish in form and substance satisfactory to A.I.D., evidence of agreement between the Ministry of Food and the Cooperative Corn Research Program (PCIM) demonstrating an arrangement with, and the contribution and responsibility of, the PCIM in the execution of the improved corn production element of the Project.

c. Grantee shall covenant to secure the services of an adequate number of qualified professional and support personnel to execute the Project and to provide fully for their administrative and logistic support.

Signature

Date

Response to DAEC Cable State 160059

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I. INTRODUCTION

The following addendum to the Project Paper, "Corn and Soy Production on Small Farms", was prepared in response to STATE 160059, "DAEC Review Soy and Corn Grant PF". The USAID consulted closely with personnel of the Ministry of Food (MinFood) and the National Corn Program (PCIM) to identify and select the levels and forms of assistance which are most critical for achievement of Project objectives. The revised Annex B showing detailed costs was submitted for AID/W concurrence in early August.

An errata sheet is attached to indicate changes to the original PP as a result of this addendum.

II. BACKGROUND (Reference Para. 8 of STATE 160059)

Previous AID assistance to Peruvian agriculture promoted substantial progress through training and institution building. Through AID contracts with North Carolina State University (NCSU) the National Agrarian University (UNA) was expanded into one of the better agricultural universities in Latin America, offering M.S. degrees in six functional areas, with research linkages throughout the country and abroad. Training under USAID/NCSU auspices broadened the research capacity at UNA and within the government. Although there remain gaps in the research field, important progress has been made in specific crops, notably rice, corn, potatoes and forages. The National Corn Research Program and the International Potato Center owe much of their achievements and capacity to past USAID supported programs. Under the present USAID contract with Iowa State University (ISU) agricultural sectoral planning has gained recognition and importance. The Agricultural Sector Planning Office (OSPA) was strengthened with ISU assistance and shows promise of expanding its influence in coordinating and guiding agricultural development. To a lesser extent, the newly established Sector Planning Office within the Ministry of Food (MinFood) will play a similar role.

With these successful programs of institution building, training and planning in the background, and in keeping with its interpretation of both the Congressional mandate and Peru's needs, the USAID is shifting gradually toward action programs designed to increase small farmer production of specific commodities or groups of commodities, in this case soybeans and highland corn -- two crops which demand different climates and respond to widely divergent cultural practices. Corn is a traditional crop which has a long and successful research history in coastal areas and a good beginning in the highlands. Soybeans are new crop with less research background and few production specialists. Perhaps even more significantly, soy is an industrial crop requiring

a processing technology that is more complicated than for most other food and feed crops.

In addressing the constraints facing small farmer production of these crops two different approaches will be used. With soybeans a comprehensive program will address research, planning, production and processing constraints. Academic training and relatively large amounts of technical assistance in several disciplines will be included in the effort. In corn, a program focused mainly on continuing and reinforcing research and accelerating technology transfer will be developed to stimulate highland production and support efforts to bring the benefits of existing and future research to sierra agriculture. The two approaches conform to the perceived requirements and states of development of the two crops involved and are designed to achieve production increases in concrete terms. Nevertheless, they are experimental in the sense that two intervention models will be evaluated for viability and replicability.

III. HIGHLAND CORN - CONSTRAINT ANALYSIS AND PROPOSED T.A. (Reference Para. 2 of STATE 160059)

The original PP identified the lack of an adequate research and extension system as the principal constraint inhibiting highland corn production and mentioned, as secondary constraints, lack of improved seed, the harsh environmental conditions, poor soils, small farm sizes, and failure to employ inputs that also constitute obstacles to increased production. Efforts to increase highland corn production are relatively new and not susceptible to evaluation at present, although the Cajamarca project which began in 1972 apparently failed because of its attempt to introduce a complete technological package which was beyond the financial capacity of the growers, a problem exacerbated by the absence of improved seed of the varieties they desired most. This failure gave rise to the present approach which depends upon improved seed of varieties readily acceptable to low income farmers, which will achieve moderate production increases, rather than an expensive input package which could yield greater results but requires greater investments. Such investments on the part of most farmers are not currently feasible. At the same time, new seeds are highly responsive to fertilizer and water.

The lack of improved seed of the varieties desired by farmers is the second most important constraint, one which Peruvian technicians are able to attack technically, with commendable results. The varieties they have improved are the result of mass-selection, a technique in which Peruvian corn breeders have demonstrated expertise. The Director of PCIM and his principal assistants have, however,

consistently expressed the need for technical assistance from U.S. sources in certain specialized aspects of their program. These technical specialties include breeding for drought and frost resistance, disease resistance, and protein improvement. They cite two U.S. Universities as possible sources of technical assistance in these fields: Cornell in frost and cold resistance and the University of Illinois in protein improvement. Although contact is maintained with CIMMYT, Peru cannot rely on that institution for direct and timely assistance in these specific areas on a sustained basis.

In addition, Peruvian corn specialists recognize that, while they have made progress in plant breeding, they are in need of assistance in agronomic aspects of production, particularly in problems related to soil fertility. Their preliminary plan referred to a need for technical assistance in this area and they have maintained this position throughout project development. There are two more needs that, according to PCIM and Ministry personnel, should be met through outside T.A. In the area of seed management Peruvian personnel believe they need assistance of the kind available from Mississippi State. In the field of financial and economic analysis there is a need for T.A. to help guide decisions on the areas to be included in the program, levels of inputs that should be recommended and solutions to possible marketing problems. Peruvian corn personnel believe this need could be met on a short-term basis by expertise available at Purdue.

The table below summarizes the kinds of technical assistance from U.S. sources that are needed for the success of the program as outlined by PCIM and MinFood personnel. What is desired is not U.S. leadership of the program, but rather U.S. cooperation within the program to help reinforce Peru's capacity to meet and overcome the full range of problems associated with the total program. In this regard it is important to note that the work done in recent years has been accomplished on a shoestring. While coastal corn production research has shown dramatic, tangible returns and has become virtually self-supporting, highland corn research is new, with goals that are social as well as economic. Scarce resources have produced uneven progress. U.S. technical assistance will be used to fill in areas of weakness recognized by the Peruvians themselves.

T.A. Requested	Constraints Addressed	Output to be Served
Agronomic and Soil Fertility	Poor Soils, Low Technology	Strengthen extension system to deal with the constraint
Plant breeding	Drought, Frost and Disease: Low Nutritional Value	Strengthen research system improved seed Opaque II incorporation
Seed Management	Lack of Improved Seed	Seed Production and Delivery
Financial & Economic Analysis	Small Farm Management Problems	Strengthen extension system, annual production plans
Special Production Problems, Entomology, Plant Pathology	Various	Strengthen R & E system to meet special problems

In view of the foregoing, the Project retains a minimal capacity to provide technical assistance. The amount of services has been reduced by nearly two-thirds since the PRP was submitted. It is believed, however, that some mutual support will be possible between the corn and soy elements of the project so that, for example, economic analysis for both elements can be aided by one technician, nominally programmed for the soybean element of the project.

IV. PRICE POLICIES - IMPACT OF SUBSIDY REDUCTIONS (Reference Para. 4 of STATE 160059)

The GOP has demonstrated that its policy regarding domestic soybean prices is to move them generally in line with world prices. With the recent devaluation, the subsidy to the domestic producer was effectively eliminated as world prices rose and the real domestic price fell. Given the new exchange rate of S/.65 = \$1.00, the new floor price was placed at \$7.66/bu. (S/.18.30/Kg.) as compared with the old price of \$10.71/bu which was in force before devaluation.

At the same time the subsidy to processors was greatly reduced. The State Enterprise for Agricultural Services (EPSA) now is committed to sell soybeans to processors at \$6.97/bu, a loss of about \$0.69 on high jungle beans where formerly the loss was about \$5.20. The following data illustrate the changes made in price relationships as a result of devaluation and subsequent price adjustment.

	Pre-Devaluation S/.45 = \$1.00	Post-Devaluation S/.65 = \$1.00	Net Change
(Producer)			
Sol Price/bu	S/.428	S/.498	(+ 14%)
\$ Price/bu	\$10.71	\$7.66	(- 28%)
(Processor)			
Sol Price/bu	S/.233	S/.453	(+ 94%)
\$ Price/bu	\$5.17	\$6.97	(+ 34%)

The current Peruvian price to processors for its domestic beans is roughly equivalent to an average FOB U.S. port price (in the neighborhood of \$7.00/bu) but less than the CIF Lima price of imported beans because of freight and insurance costs, which can vary between \$20.00 and \$40.00/MT, (\$0.54-\$1.08/bu). The short-term result is that soybeans produced in Peru are at least as attractive to processors as imported beans. It appears, therefore, that the GOP could, and probably will, eventually charge processors the full cost of locally procured soybeans without reducing demand as the government continues its frequent adjustment of official prices.

The long-term impact of reduction or elimination of subsidies on replication of the project beyond its proposed scale is almost wholly dependent upon the world market price for soybeans and the GOP's reserve position. With its current economic crisis, e.g., unfavorable balance of payments, shortage of foreign exchange, rapid inflation and faltering production of the GOP has had to eliminate certain subsidies such as the one on imported wheat. Millers now pay the full cost of the wheat acquired from abroad by the Government. The price of bread has been allowed to rise accordingly. The higher the world price of any commodity, the more attractive the domestic production of the commodity will be. It is necessary therefore to refer to futures prices of soybeans to try to ascertain trends and the forces behind them. The world price of soybeans for August 1976 delivery rose, between June 17 and July 12, from \$6.25/bu to \$7.25/bu. On June 17 the cash price on the Chicago exchange was \$6.14/bu. On July 7 the price reached \$6.98/bu., or \$0.68 less than the Peruvian support price, a negligible difference when freight and insurance costs are added.

A series of factors in world agriculture production enhance the probability that the medium term (2-3 years) price of soybeans will be in the \$7.00-\$8.00 range. These factors include the drought in Europe which will place greater demand on the world market for livestock feeds, and the continuing Soviet demand for major commodities including soybeans. Other factors are the uncertainties in Brazilian and Argentine production as well as the downward trend in gross U.S. production.

The salient feature of the present policy on soybean prices in Peru are therefore:

- a. The domestic price stated in U.S. dollars will be somewhat lower than the CIF Lima price of imported beans for the foreseeable future.
- b. Domestically produced soybeans will be more attractive to local processors than will imported beans, because of the lower price and the scarcity of dollars.
- c. Prices in the high jungle, the project area, will be higher than in the coast. The policy is to encourage high jungle production by absorbing the transportation costs.
- d. Prices of other commodities, e.g., wheat and corn, will be loosely tied to world market prices, since they are also imported in large quantities.

Virtual elimination of subsidies has become a reality since PP submission. The domestic price structure has, in effect, become more realistic and, because of the world price situation, soybeans grown in Peru should now be more attractive than formerly, both to farmers and processors. In local currency the price to farmers is up while production costs have been held steady and transportation costs have been assumed by the GOP. Processors will prefer slightly less expensive domestic beans to imported beans which are not only slightly higher in price but also require foreign exchange. The chance of meeting and surpassing projected production targets is thus improved.

V. FEASIBILITY OF SOY FORTIFICATION - BENEFITS TO THE POOR AS A PROJECT PURPOSE (Reference Para. 5 of STATE 160059)

Soy fortification of wheat products is not a new phenomenon. Extensive research into the process has been conducted at Kansas State University, the University of Illinois, the USDA's Northern Regional Research Laboratory and other locations for decades. At least two countries, Israel and Peru's neighbor, Colombia, now require the addition of 5% soy flour to their bread. ^{1/} The Miller's National Federation information pamphlet entitled Soy-Fortified Wheat Flour notes that "breads made with either 6 or 12% SFF (soy fortified flour) are an excellent means of inexpensively providing improved nutrition to both children and adults... The resulting breads will have good loaf volume, color and texture with no trace of soy flavor".

Early experimentation with SFF produced unsatisfactory results as to loaf size but more recent research has produced substantial success in the use of SFF in the baking industry. Processes recommended by soy processing specialists for bread using more than 12% SFF require the use of an emulsifier to maintain loaf size. One such emulsifier, Sodium Stearoyl Lactylate, permits the use of up to 24% soy flour without loaf size reductions or other unfavorable results, according to CC. Tsen and W.L. Hoover of Kansas State University. The fortification levels of 6-12% foreseen by this project present no consumer acceptance problems whatever and the cost of emulsifiers is negligible. Noodles also present no consumer acceptance problems. Only their color is affected, SFF noodles being somewhat darker than ordinary noodles. Local noodles are already typically brown in color because of wheat milling standards now in force. Therefore, there should be no significant change in color.

^{1/} Source: Smith and Circle, Soybeans: Chemistry and Technology AVI Publishing Company, Inc. - Westport, Connecticut, 1972 Vol. I, p. 347.

Most milk marketed in Peru is imported, reconstituted, powdered milk. Fluid milk production has been reduced by about 5% since 1970. With any one of several processes which use defatted or full-fat soy flour, a bland, white soy milk can be produced at a cost well below that of either fluid or reconstituted milk, as already stated in the PP. This soy milk can be dried for shipment in powdered form and can be used to replace imported dried milk solids in reconstituted milk or even to replace the non-fat dried milk powder used in some kinds of bread, thus helping reduce costs for both reconstituted milk and bread.

The PP stated that the cost of SFF breads will be roughly only 4% more than ordinary bread at current prices. This was based on the fact that only 58% of bread production costs are attributable to flour and that soy flour would be 8% more costly than wheat flour but would make up only 12% of the total flour used. However, Peru's breads are sold by weight and soy flour demands the use of greater quantities of water. Therefore, SFF breads should actually be somewhat cheaper than ordinary breads because about 6% more bread would be produced both by weight and by volume. In a 1975 report Hoover (KSU) confirmed: "-- If SFF costs only 2.5 percent more than wheat flour -- the cost of bread will in all probability be no more than at present and will possibly be less". ^{1/} In addition, it is possible to use soy flour not only to replace wheat flour but also the more expensive non-fat dry milk (NFDM) used in some types of breads, thus reducing the cost of breads which now employ NFDM. Technical assistance in the form of food technologists and economists will serve to help optimize the price advantages and to rationalize them with nutritional benefits.

Noodles and bread and to a lesser extent the cheaper reconstituted milk are common items in the diet of Peru's poor urban population. Because of the potential benefits of soybean fortification to Peru's poorest people, the project retains the objective of raising the nutritional level of food available to the poor by adding protein to the products they consume in relatively greater amounts. These products, bread and noodles, now made from imported wheat flour, are available in every corner of Peru. Country-wide, cereals and their derivatives including bread and noodles make up 23.5% of the diet as shown in Table 3-F of the PP. Roughly 50% of this is made up of the annual 700-800,000 MT of imported wheat. Existing flour mills,

^{1/} W.L. Hoover "Impressions on the Potential for Soy Fortified Wheat Foods in Peru" 1975.

located primarily on the coast, supply the flour for these products. Existing distribution networks deliver them. If SFF were to be introduced it would achieve widespread distribution, even in the jungle.

The PP indicates levels of nutrition in various socio-economic strata of Peru, the percentage of income spent on food, and the kinds of food purchased. It indicates that soy fortified bread and noodles can be produced at competitive prices and with great nutritional benefit. The PP shows that this will benefit poorer people primarily because of their food consumption habits. It demonstrates that soy-milk can be made and distributed at a cost well below reconstituted milk made from NFDM. Based on these facts and on the firm intention of the GOP to channel soybeans into products for direct human consumption, nutritional benefits remain as one of the project purposes.

A review of the literature on the quality of soy products supports the conclusion that there is no qualitative difference between soy fortified products and their wheat-based counterparts at the levels of fortification contemplated by the Project, using simple technologies which can be adopted for use in Peru.

VI. FARM LEVEL FINANCIAL ANALYSIS (Reference para. 6 of STATE 160059)

A. Methodology

Additional analysis was performed to examine cash flows at various levels of costs and returns to farmers employing different combinations of crops. Farms employing rotation systems of various crops were compared with farms which do not employ such systems. Farms including soybeans in rotation with other crops were compared with those who do not plant soybeans.

As in the original analysis, the basic unit of comparison is a five hectare non-mechanized high jungle farm which employs only family labor. Three crops commonly found in the production zone - rice, corn and yuca - were combined in the analysis with soybeans. Four basic decisions, yielding eight outcomes or results, were used to represent production decisions on the part of the farmer in year one of the project or any given year during the project when the farmer is able to chose to plant or not to plant soybeans.

The analysis holds yields constant throughout the six year cashflow period in order to give a slight advantage to corn and rice, the yields of which are slightly over-stated, and to make conservative the estimates of increased returns from planting soybeans. A discount factor of 18% was used to represent an opportunity cost for capital. Both costs and returns are assumed to increase at the same rate over the period so that net values of production are stated in 1976 currency throughout. Home consumption is valued at market prices and included in gross returns. Labor is assumed to have no direct cost to the producer since it is supplied by the family or traded in kind at peak seasons. Assigning a direct cost for labor would also place rice in a less competitive position vis-a-vis less labor-intensive crops, including corn and soybeans, skewing the analysis unrealistically in favor of the other crops, when in fact, rice is the most common choice at present.

Four decisions were evaluated using a discounted cash flow methodology to arrive at a net present worth (NPW) of the farmer's decision to employ his resources in different ways. The decisions range between planting one crop of rice on four hectares and one crop of casava on one hectare each crop year (least profitable) to a decision to rotate rice with soybeans on two hectares and corn with soybeans on two hectares with the remaining hectare producing one crop of casava (most profitable). Based upon these

decisions, various assumptions about prices and costs were introduced to test sensitivity to unexpected events such as rising costs of production and crop failures. A total of eight cash flows were evaluated.

B. Results

For all decisions cash flows are positive with NPW's ranging from S/.148,966 to S/.399,882. The highest NPW is found in the 3rd decision i.e., to rotate soybeans with corn and with rice keeping one hectare of yuca. The next most positive NPW (S/.383,291) is produced by the same decision (3-B) even if real soybean production costs rise 10% a year for the last four and six years and other production costs remain static. The 3rd most profitable result (3-A), again involves soybeans in rotation with rice and corn, but heavy crop losses are assumed as a sensitivity test. An entire rice crop (2 ha.) is lost in the 2nd year, a corn crop (2 ha.) in the 3rd year and half of the soybean crop (2 ha.) in the 5th year. The resulting NPW of 307,857 is still respectable even with these losses although the cash flow shows greater sensitivity to crop failure than to rising costs of production. The fourth and fifth most profitable choices are 1-A and 2-A in which rice is rotated with corn but no production problems occur and costs do not rise.

Decision N°2 occupies the sixth position. This involves rotating rice and corn on four hectares with one hectare of casava and assumes increasing real costs of 10% in rice and corn production because of a need to invest more to maintain soil fertility as a result of the heavy nutrient demands of those crops. Decision one occupies 7th place in profitability because rice and corn crop losses are assumed as a result of disease built-up. The low NPW of this result as compared with result 1-A (the 4th highest NPW) shows this decision to have relatively greater sensitivity to crop losses. (It is also more likely to produce such losses.) Decision four -- one crop (4 ha.) of rice per year and one hectare of casava is least profitable even though it is currently a common choice in the jungle. See Table 1-4 for the costs of production, prices and expected yields of the crops included in the analysis and Table 5 for the cash flow and NPW statements. A summary of the results appears below in Tabular form.

<u>Cropping Pattern Chosen</u>	<u>Special Conditions</u>	<u>Net Present Worth -S/.</u>
(1) 4 ha. rice (2 crops on 2 ha.) 4 ha. corn (2 crops on 2 ha.) 4 ha. yuca (1 crop on 1 ha.)	Losses equivalent to: 2 ha. rice 2 ha. corn 1 ha. yuca	184,171.
(1-A) Same	No losses	246,037.
(2) 4 ha. rice (1 crop on 4 ha.) 4 ha. corn (1 crop on 4 ha.) 1 ha. yuca (1 crop on 1 ha.)	Cost of production increases 10%/year following rice) starting in 3rd year.	184,423.
(2-A) Same	No cost increases	246,037.
(3) 2 ha. rice in rotation with soybeans 2 ha. corn in rotation with soybeans 1 ha. yuca	None	399,882.
(3-A) Same	Crop losses 2 ha. rice in 2nd year 2 ha. corn in 3rd year 2 ha. soy in 4th year	307,857.
(3-B) Same	Soybean costs of production increase 10%/year starting in 3rd year.	383,921.
(4) 4 ha. rice + fallow 1 ha. yuca	Rice costs of production rise 5%/year, volume or value of production increases 10%	148,966.

C. Conclusions

Soybeans are highly competitive in the jungle environment. Their inclusion in farming patterns would tend to reduce risks, and increase returns to the farmer even when their costs of production rise. They remain competitive even when heavy crop losses are incurred due to natural phenomena. They help spread risks, reduce disease build-up and present fewer problems of soil fertility. Their price is attractive and reasonably in line with anticipated world market prices over the next several years; their cost of production is lower than that of most other crops partly because of a lower nitrogen fertilizer usage rate and because transportation costs no longer have to be included as a cost. Soybean profitability is sensitive to crop losses. At the same time their use in rotation systems tend to reduce crop losses. Sensitivity to cost of production increases is not high.

It can be concluded therefore that soybeans have a significant place in jungle farming patterns and that they can offer a wider range of more profitable choices than are available from patterns presently employed. The least profitable result of using soybeans in rotation yields 25% more returns than the most successful traditional pattern. The most successful soybean rotation pattern is 169% more profitable than the least successful traditional system. Substantial gains in real farm incomes can therefore be expected to result from participation in this project.

TABLE 1

COSTS EMPLOYED IN CASH-FLOW ANALYSIS

Crop: Rice, Irrigated, Jungle, 1 hectare	S/.
Land preparation and nursery work	3,200.
Transportation of seedlings	85.
Seed (100 Kg. at S/.14.90)	1,390.
Urea (235 Kg. at S/.28)	6,580.
Transport seed and urea	300.
Water	200.
Pesticides	1,285.
Bags	740.
Transportation to market 2000 Kg. at S/.2.00)*	4,000.
Direct Costs (Sub-Total)	17,780.
Interest on Production Loan (7% of 14,224 for six months)**	499.
TOTAL:	18,279.

Value of production = 2,000 Kg. x S/.12 = S/.24,000.

* Charged to farmer

** 80% of cost of production

Days Labor

Nursery and Land Preparation	20
Transplanting	32
Plant Protection	28
Irrigation	10
Harvest	15
	<hr/>
	105

TABLE 2

COST EMPLOYED IN CASH-FLOW ANALYSIS

Crop - Soybeans, Non-irrigated, Jungle, 1 Hectare	<u>S/.</u>
Land preparation and planting	3,200.
Seed (60 Kg. at S/.23)	1,380.
Triple Super Phosphate (130 kg. at S/.7.36)	957.
Innoculant (1 dose at S/.280)	280.
Pesticides	1,048.
Bags	600.
Transport (1,500 at S/.0.47)*	705.
Direct Costs (Sub-Total):	<hr/>
	8,170.
Interest on Production Loan ** (7% of 6,536 for 5 months)	190.
TOTAL:	<hr/>
	8,360.
	<hr/> <hr/>

Value of production = 1,500 Kg. x S/. 18.30 = S/.27,450.

Days Labor

Land preparation and planting	5
Cultivation	19
Plant protection	8
Harvest	17
	<hr/>
	49

* Farm to local collection point. Remaining transport costs absorbed by GOP, lowering farmers' actual cost.

** 80% of cost of production.

TABLE 3

COST OF PRODUCTION USED IN CASH-FLOW ANALYSIS

Crop: Corn, Non-irrigated, Jungle, 1 hectare

	<u>S/.</u>
Land Preparation and planting	1,800.
Seed (20 Kg. at S/.12)	240.
Pesticides	1,500.
Urea (180 Kg. at S/.28)	5,040.
Triple Super Ph (80 Kg. at S/.7.36)	589.
Transport to market (2,000 Kg. x S/.2)*	<u>4,000.</u>
Direct Costs (Sub-Total)	13,169.
Interest on Production Loan ** (7% of 10,535 for 6 months)	<u>369.</u>
TOTAL:	13,538.

Value of production = 2,000 Kg. x S/. 12 = S/. 24,000.

Days Labor

Land preparation and planting	10
Cultivation	12
Harvest	21
	<u>43</u>

* Charged to the producer against purchase price.

** 80% of costs of production.

TABLE 4

COST OF PRODUCTION USED IN CASH-FLOW ANALYSIS

Crop: Casava (Yuca), Non-irrigated, Jungle, 1 Hectare

	<u>S/.</u>
Land preparation and planting	3,800.
Plant material (seed) (14 bags at S/.30)	420.
Pesticides	1,500.
Fertilizers	--
Transport to market (12,000 Kg. x S/.0.5)*	6,000.
	<hr/>
Direct Costs (Sub-Total)	11,720.
Interest on Production Loan (7% of 9,376 for 12 months)	656.
	<hr/>
TOTAL:	12,376. <hr/>

Value of Production = 12,000 Kg. x S/.1.5 = S/. 18,000.

Days Labor

Soil Preparation	10
Planting	30
Cultivation and Harvest	30
	<hr/>
	70

* Transportation to local market only.

TABLE 5

NET PRESENT WORTH OF FOUR BASIC CROP PRODUCTION DECISIONS ON A FIVE HECTARE SINGLE FAMILY FARM

Decision 1

4 Hectares Rice (2 crops on 2 hectares) Static, no rotation
 4 " Corn (2 " " " ")
 1 " Yuca (1 " " " ")

Year	Production Costs			Total Costs	Gross Value Of Production*	Net Value of Production	Discount Factor (18%)	Net Present Worth
	Rice	Corn	Yuca					
1	73,116.	54,152.	12,376.	139,644.	210,000.	70,356.		<u>S/.</u>
2	"	"	"	"	210,000.	70,356.	.847	59,592.
3	"	"	"	"	162,000.	22,356.	.718	50,516.
4	"	"	"	"	162,000.	22,356.	.609	13,615.
5	"	"	"	"	192,000.	52,356.	.516	11,536.
6	"	"	"	"	210,000.	70,356.	.437	22,880.
							.370	<u>26,032.</u>
								<u>184,171.</u>

* Without rotation, losses equivalent to 1 crop of rice (2 ha.) in 3rd year; one crop corn (2 ha.) in 4th year; 1 crop yuca (1 ha.) in 5th year or equal increases in cost of production due to disease and pest build-up.

Decision 2

4 Hectares Rice (1 crop on four has.)
 4 " Corn (1 crop on four has. in rotation)
 1 " Yuca (1 crop)

1	73,116.	54,152.	12,376.	139,644	210,000	70,356.		
2	"	"	"	"	"	"	.847	59,592.
3	80,120.	59,567.	"	152,063.	"	"	.718	50,156.
4	88,132.	65,524.	"	166,032.	"	57,937.	.609	35,284.
5	96,945.	72,076.	"	181,397.	"	43,968.	.516	22,687.
6	106,340.	79,284.	"	198,000	"	28,063.	.437	12,264.
						12,000.	.370	<u>4,440.</u>
								<u>184,423.</u>

Real production costs of rice and corn rise 10%/year beginning 3rd year to maintain soil fertility.
 No crop losses.

Decision 3

2 Hectares Rice in rotation with Soybeans
 2 Hectares Corn in Rotation with Soybeans
 1 Hectare Yuca

<u>Year</u>	<u>Production Costs</u>				<u>Total Costs</u>	<u>Gross Value of Production</u>	<u>Net Value of Production</u>	<u>Discount Factor (18%)</u>	<u>Net Present Worth</u>
	<u>Rice</u>	<u>Corn</u>	<u>Soy</u>	<u>Yuca</u>					
1	36,558.	27,076.	33,440.	12,376.	109,450.	223,800.	114,350.	.847	96,854.
2	"	"	"	"	"	"	"	.718	82,103.
3	"	"	"	"	"	"	"	.609	69,639.
4	"	"	"	"	"	"	"	.516	59,005.
5	"	"	"	"	"	"	"	.437	49,971.
6	"	"	"	"	"	"	"	.370	42,310.
									<u>399,882.</u>

Decision 4

(Four ha. rice followed by fallow: one ha. yuca)

		*		**					
1	73,116.		12,376.	85,492.	114,000.	28,508.	.847	24,146.	
2	76,772.		"	89,148.	123,600.	34,452.	.718	24,736.	
3	80,611.		"	92,987.	134,160.	41,173.	.609	25,074.	
4	84,642.		"	97,018.	145,776.	48,758.	.516	25,159.	
5	88,874.		"	101,250.	158,554.	57,304.	.437	25,041.	
6	93,177.		"	105,553.	172,609.	67,056.	.370	24,810.	
								<u>148,966.</u>	

* Rice Production Costs increased by 5%/year.

** Rice Volume and/or Value increased by 10%/year.

VII. MARKETING AND USE OF SOYBEANS (Reference para. 7 of STATE 160059)

A. Marketing Arrangements

The GOP will be the principal buyer of soybeans. Purchases will be made directly from farmers in the zones of production and assembly will be accomplished at any one of several small warehouses, which are found in all areas. These warehouses, generally of about 800 MT capacity, are the property of the State Enterprise for Agricultural Services (EPSA). EPSA agents will contract truckers to haul assembled grain from jungle warehouses. Contracts are usually arranged with transportation unions who operate on fixed rates both for hauling into and out of the jungle. Because the unions are politically strong and cohesive, there is no price differential for either leg of the journey, according to EPSA's officials and union members. Since comparatively heavy volumes are transported to the coast, EPSA finds it necessary to deal with the unions which command larger numbers of vehicles and can be available on short notice. The possibility of the Project benefiting from reduced back-hauling rates to achieve lower-cost distribution of soy products is therefore eliminated.

Land routes to and from San Ramón, Bagua and Tingo María are reliable. The journey from production areas to present processing facilities is between 12 and 24 hours by truck over the Andes to the coast. The cost to EPSA is between one and two sols per kilogram (\$15.00 - 30.00/MT) depending upon volume and point of origin.

On the coast, processors extract the oil and sell to wholesalers and retailers who, in turn, handle its distribution throughout Peru. There are two grades of cooking oil in the distribution system. One is a blend of fish oil and vegetable oil (cottonseed and soy). The other is pure vegetable oil which sells at a higher price. These oils are generally available in all parts of the country at fixed prices in retail stores and shops*. A 1972 survey showed per capita consumption of blended oil in the high jungle to be 3.1 Kg. or about 9/10 gallon per year. This figure does not include pure vegetable oil or margarine which are also consumed there. Soybean meal is used primarily in the coastal poultry industry. A small amount of soybeans, probably not more than 5% of total production at present, are sold as raw beans in coastal markets or in the production zones.

* The official prices are S/.44 and S/.53, respectively.

Some of these are used in the preparation of beverages sold by street vendors. The remainder are used in private homes. MinFood promotes this use by publishing and distributing recipe books on the uses of soybeans.

B. GOP Nutrition Policy

Peru finds itself increasingly dependent upon imported commodities to feed its population. Wheat, corn, non-fat dry milk, vegetable oil and soybeans make up a large part of imports. Domestically produced soybeans can be used to meet requirements for all of these products. They contain oil; their meal can substitute for corn in animal rations; soy flour can be used to replace and fortify wheat flour and can substitute for non-fat dry milk. Technologies exist for all of these uses and are adaptable to Peru. The policy of the GOP is to seek a balanced, economic and socially beneficial formula for allocating soybeans among the various uses.

The body directly responsible for policy development in this field is the National Nutritional Advisory Council, headed by the Director-General of Research (DGI) of MinFood. Members of the Council include The Agro-Industrial Research Institute (IIAI) and the Institute for Industrial Research and Technical Standards (INTINTEC).

The Council has developed tentative policies based on projected soybean production. Essentially the policy is to: (a) cover through domestic soybean production as much of the total vegetable oil requirement as possible. This would amount to about 20% of production or somewhat more than 10,000 MT by 1980, amounting to roughly 5% of the projected demand for cooking oil; (b) after oil extraction, use as much as possible of the remaining 80% of the defatted soybeans for direct human consumption in the form of low-cost beverages and fortified noodles and bakery products; and, (c) use as animal feed the soybeans that cannot be allocated for direct human food uses. Peru will continue to import raw soybeans and soybean oil in the amounts required, within constraints imposed by foreign exchange shortages. These will be used in the same manner as domestic beans though proportionately more will be used as poultry feed.

Research in the short run will center on developing substitutes for the more expensive imports e.g., milk products. This line of research will be pursued because of the certainty that soy-milks can be produced more cheaply than NFDM and can be mixed with whole or reconstituted milk, thus reducing costs and saving foreign exchange.

The current price for reconstituted milk is S/.11 as compared with S/.17/litre for whole fresh milk. The savings is significant for poor families. With U.S. technical assistance, IIAI will also pursue economic and technical research in bread and noodle fortification to test the viability of such fortification in Peru. The tentative goal is to displace between 40,000 and 80,000 MT of wheat flour as rapidly as possible. To do this, both domestic and imported soybeans will be needed. The price advantages of soy beverages are greater than those of soy flours so this is the first line of research. However, soy fortification of bread and noodles is believed to be possible by food processing experts who have evaluated the situation here within the last year. The amount of soy flour (40,000 to 80,000 MT) represents between five and ten percent of current wheat consumption and should permit at least an equivalent level of fortification. This production will be directed into the system through close governmental controls already in operation.

The GOP allocates commodities to processors for specific purposes. Soybeans allocated to a plant are processed for oil which is sold at a set price. Meal deliveries to feed manufacturers are made according to government edict, also at a set price. The changes in the process required to produce defatted soybean meal suitable for grinding into soy flour involves simple machinery which can be constructed in Peru, namely a cooker or heater to destroy the trypsin inhibitor, which produces beany flavor, and a dehuller, used to remove the fibrous outer layer of the bean. The dehuller may be optional, depending upon the end product expected. Cooked, dehulled beans can be put through an expeller and solvent extraction process, after which the meal is ready for milling and combination with wheat flour. Full-fat soy flour can be produced from whole beans for a variety of purposes using specialized machinery available at reasonable prices in the U. S.

Once a process has been developed and tested at IIAI, the GOP can assure its adoption by industry by setting prices and uses for end-products and providing incentives based on subsidies or resource allocations. For example, oil processors willing to make modest investments in equipment and to produce a new soy product could be granted a larger share of imports at relatively more attractive prices. The GOP can also facilitate exchange transactions for off-shore machinery acquisition if necessary. The magnitude of incentives for specific categories of investment will be based on economically desirable usage levels the determination of which will proceed from evaluations conducted under this Project. Though the project will not finance investments by the enterprises which will ultimately produce soy

products, it will develop the necessary technology and verify the feasibility of such investments. A separate GOP fund has been created for research counterpart funds and for investments in processing plants and equipment. This fund is derived from a tax on processors and amounts to about S/.65,000,000 which is managed by INTINTEC.

C. Intermediate Technologies

Experience in Peru indicates intermediate technologies for processing soybeans within the production areas are not promising at present. A small plant of about 4 MT/day capacity was established in Aucayacu (the Tingo Maria area) to supply a prospective poultry and swine feeding industry. The plant produces feed with high oil content which turns rancid quickly. It extracts too little oil to make a profit on that product. The continuation of the activity is in doubt. Intermediate technologies on a smaller scale, particularly for animal feed production or oil production on the farm, have very little merit in terms of the production area. Farm sizes are not large enough to permit vertically integrated feeding operations. Neither could the farm family store for its own use the oil that could be extracted from the soybeans. Assembly of oil and meal from numerous small producers would be complicated, costly and wasteful.

The real value of soybeans to producers is as a cash crop in rotation with other crops especially where disease and soil fertility problems currently dictate rotation or fallow and soybeans become an additional crop or one which replaces a second non-legume grain crop, such as rice or corn, with heavy nitrogen fertilizer requirements. To introduce soybeans as an item for home processing and consumption would reduce the potential financial return to farmers to the point that chances of their adoption would be reduced. As shown in Table 3-E of the original PP, over half of the food consumed by farm families is home-produced, reflecting their subsistence farming status. What is required to break this pattern is an additional cash crop, not another garden crop.

The possibilities for adding value to soybeans by home processing through the application of intermediate technologies imply the investigation of a technology new to the Peruvian high jungle. The need to provide additional technical assistance to both Peruvian farmers and technicians, probably with low marginal returns on the cost of such assistance, precludes its inclusion within the budget of this Project. With over 50% unused installed processing capacity in the coast (See page 22 of the PP), additional investments in home processing capacity would

seem superfluous. Moreover, it is generally accepted that to be efficient a plant should be able to process 50 to 100 MT of soybeans or more per day. Such economies of scale could not even be approached in cottage industry and the myriad market channels needed to assemble, store, ship, and redistribute the resulting products would be costly indeed. The possibility of including in this project intermediate technologies for home processing of soybeans is deferred at least until production is well established and/or additional resources become available.

The GOP has, however, submitted a formal request to the Government of Holland for assistance which includes, in the short run, a pilot plant for extraction of oil in Tarapoto. The plant would have an oil production capacity of 10 MT per year initially, equivalent to only 50 MT of beans processed. Meal from the plant would be used in the local livestock industry. The prospects for financing by Holland seem good and the small pilot plant necessarily will be a focal point for coordination and evaluation though it will not add to costs or outputs of this project.

DEPARTMENT OF STATE TELEGRAM

ANNEX K
25

ACTION: USAID
INFO: AMB DCM ECONCHRON

UNCLASSIFIED CONTROL: STATE 160059
Classification 28 JUN 76 1514

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FM SECSTATE WASHDC
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ACTION: AGR (FILES)
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E.O. 11652: N/A

TAGS:

SUBJECT: DAEC REVIEW SOY AND CORN GRANT PP

1. THE DAEC REVIEWED THE SUBJECT PP ON JUNE 16. TO AUTHORIZATION IS CONTINGENT UPON SUBMISSION AND APPROVAL OF A REVISED PP BY EARLY SEPTEMBER CONTAINING THE CHANGES SUGGESTED BY THE DAEC AND DESCRIBED IN THE FOLLOWING PARAGRAPHS.

2. CONSTRAINT ANALYSIS: THE REVISED PP SHOULD DELINEATE THE CONSTRAINTS WHICH ARE PRESENTLY HINDERING HIGHLAND CORN PRODUCTION EFFORTS IN PERU. IN THIS REGARD, THE REVISED PP SHOULD EXPLAIN HOW THE PROPOSED TECHNICAL ASSISTANCE FOR THE CORN PORTION OF THE PROJECT WOULD ADDRESS THESE CONSTRAINTS.

3. TECHNICAL ASSISTANCE: THE DAEC EXPRESSED CONCERN OVER THE MAGNITUDE OF TECHNICAL ASSISTANCE AND COMMODITY PROCUREMENT PROPOSED AND THE RESULTING COST, PARTICULARLY AS IT RELATES TO THE CORN COMPONENT OF THE PROJECT. THE REVISED PP SHOULD EXAMINE MORE CLOSELY THE PROPOSED TECHNICAL ASSISTANCE PACKAGE FOR OPPORTUNITIES TO REDUCE ITS MAGNITUDE AND COST. IN ADDITION, THE EXTENSIVE COMMODITY LIST SHOWN IN THE PP SHOULD BE CAREFULLY REVIEWED AND REDUCTIONS MADE WHERE EQUIPMENT, VEHICLES AND SUPPLIES TO BE PURCHASED ARE NOT DIRECTLY RELATED TO THE PROJECT PURPOSE. THE PROPOSED FUNDING LEVEL OF THE GRANT SHOULD BE REDUCED TO REFLECT REDUCTIONS THUS REALIZED. PRIOR TO THE SUBMISSION OF A REVISED PP, THE MISSION SHOULD SUBMIT FOR AID/W REVIEW AND CONCURRENCE A REVISED ANNEX B INDICATING THE PROPOSED CHANGES IN CORN TA AND COMMODITIES.

UNCLASSIFIED

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due date 7/6

Act: 1001	<i>N/A</i>
Doc: 05	<i>P. 1/10/76</i>
Int: 000	

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DEPARTMENT OF STATE
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4. PRICE POLICIES: THE REVISED PP SHOULD FURTHER EXPLAIN GOP PRICE POLICIES FOR SOYBEANS AND THE IMPLICATIONS FOR THE SUCCESS OF THIS PORTION OF THE PROJECT IF PRESENT PRICE SUBSIDIES ARE DISCONTINUED. THE MISSION SHOULD INCLUDE IN THIS DISCUSSION HOW A REDUCTION OR ELIMINATION OF THE PRESENT SUBSIDIES WOULD AFFECT THE POTENTIAL FOR PROJECT REPLICATION BEYOND THE PROPOSED SCALE OF OPERATIONS.

5. PROJECT OBJECTIVE: THE MISSION MAY WANT TO CONSIDER AS ITS MAJOR PROJECT OBJECTIVE, FOR THE SOYBEAN PORTION OF THE PROJECT, THE INCREASE OF SMALL FARMER INCOME, IN PLACE OF ENHANCED NUTRITION THROUGH INCREASED AVAILABILITY OF SOY-FORTIFIED PRODUCTS. TO THE EXTENT THAT THERE IS A CLAIM FOR NUTRITIONAL BENEFITS TO THE TARGET GROUP FROM SOY-PROCESSED PRODUCTS, THE PP SHOULD CLEARLY DEMONSTRATE HOW THIS IS TO BE ACHIEVED.

6. ECONOMIC ANALYSIS: THE REVISED PP SHOULD INCLUDE IN ITS ECONOMIC SECTION A FARM BUDGET SENSITIVITY ANALYSIS SHOWING THE DIFFERENT LEVELS OF PROFITABILITY THAT PARTICIPATING SMALL FARMERS MIGHT ACHIEVE GIVEN VARYING PRICES OF INPUTS AND OF CORN AND SOYBEANS. [ALSO, A SMALL FARMER CASH FLOW STATEMENT SHOULD BE DEVELOPED TO DEMONSTRATE THE PROFIT LEVELS OVER TIME FOR FARMERS PRODUCING SELECTED CROPS IN ROTATION, INCLUDING SOYBEANS.] THE REVISED PP SHOULD QUANTIFY THE FINANCIAL AND ECONOMIC BENEFITS THAT WOULD ACCRUE TO SMALL FARMERS WHO INCORPORATE SOYBEANS INTO THEIR CROPPING PATTERNS.

7. SOYBEAN MARKETING-PROCESSING: THE REVISED PP SHOULD INCLUDE A MORE DETAILED DESCRIPTION OF THE MARKETING INFRASTRUCTURE FOR SOYBEANS FROM PRODUCTION AREAS TO PROCESSING FACILITIES INCLUDING ANY ARRANGEMENTS FOR THE BACKHAULING OF SOY-FORTIFIED PRODUCTS AND SOYBEAN OIL TO PRODUCTION AREAS. IN ADDITION, THE PP SHOULD EXPLORE THE POSSIBILITIES OF SOYBEAN PROCESSING WITHIN THE PROPOSED PRODUCTION AREAS AND DISCUSS THE POSSIBLE USES AND BENEFITS OF SOYBEAN INTERMEDIATE PROCESSING TECHNOLOGY.

8. ON PAGE 9 OF THE PP, THE PROJECT BACKGROUND WAS DELETED AND REFERENCE WAS MADE TO THE BACKGROUND SECTION (PART II, PROJECT DESCRIPTION) INCLUDED IN THE PRP. THE REVISED PP SHOULD INCLUDE ALL PERTINENT SECTIONS IN ACCORDANCE WITH CHAPTER 6 OF HANDBOOK 3. ROBINSON

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UNCLASSIFIED

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UNOFFICIAL TRANSLATION

Letter N° 76-AL-DS-DGP

Mr. Donald R. Finberg
Director
USAID

SUBJECT: Development of the Integrated Corn and Soy Projects

I have the pleasure to reiterate the points made during our conversations on the above subject to the effect that, based on careful analyses carried out in collaboration between officials of this Ministry, the USAID, and the National Corn Program, the Ministry of Food intends to develop these programs in appropriate areas: corn on small farms in the sierra, and soybean production principally in selected high jungle areas of Peru.

The purpose of these programs is to achieve self sustaining growth in the production and consumption of soybeans, improved corn, and soybean food products in order to increase productivity and incomes in our small farm sector and to improve nutrition in that sector and among the population at large.

To this end, my Ministry plans to expand the research and production efforts needed to produce improved varieties and seed for both commodities and to increase our ability to disseminate information to the farmers who will produce those commodities.

We estimate that this effort will require a component of professional semi-professional and administrative personnel for which the Ministry is considering budgetary support on the order of S/.186 million (\$4,133,000) as well as a possible contract with PCIM to secure many of the necessary technicians for the corn program.

Nevertheless there remain several necessities for a successful program which are beyond our ability to finance. These are research and extension equipment, vehicles to assure close extension contact with farmers, technical assistance, and various kinds of training, both in Peru and abroad, which will guarantee the presence of technicians qualified to carry on the long-range effort. For this reason USAID assistance is requested to cover the dollar cost of these goods and services in the amount of \$2,400,000 over a four (4) year period beginning in the last quarter of 1976.

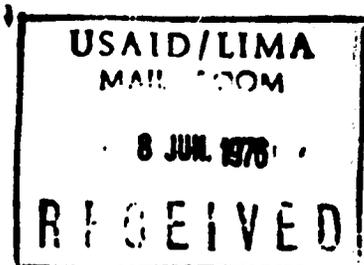
- 2 -

The technical and material assistance of the United States Agency for International Development requested for these programs is of primary importance to the welfare of many of our poorest people.

Marciano Morales Bermúdez
Director Superior
Ministry of Food



Lima, 7 JUN. 1976



OFICIO N° 184 -76-AL-DS-DGP

SEÑOR : Donald R. Finberg
Director de la Agencia para el Desarrollo Inter-
nacional (AID) en el Perú

ASUNTO : Desarrollo de los Proyectos Integrales de Soya y
Maíz Amiláceo

Tengo el agrado de dirigirme a Ud., para reiterarle lo que le manifestara durante las conversaciones que hemos venido sosteniendo con relación a los proyectos mencionados en el asunto del rubro, en el sentido de que, luego de los estudios llevados a cabo por funcionarios de este Ministerio en colaboración con la Agencia de su Dirección y el Programa Cooperativo de Investigaciones en Maíz (PCIM), nos proponemos desarrollar estos proyectos en áreas que reúnen condiciones para su cultivo: en la sierra, caso del maíz amiláceo, y en la selva alta, principalmente, en el caso de la soya.

El propósito que se persigue con estos proyectos es el de buscar un crecimiento auto-sostenido en la producción y consumo de maíz amiláceo mejorado y de frijol de soya, incluyendo los productos alimenticios derivados de este último, teniendo como objetivo final el incrementar la productividad e ingresos de los productores, así como mejorar el nivel nutricional en dicho sector y en la población en general.

Es así que el Ministerio de Alimentación persigue, aunando esfuerzos en investigación y producción, lograr variedades mejoradas en ambos productos y divulgar entre los productores la información técnica como medio principal para lograr la transferencia de tecnología.

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**MINISTERIO DE ALIMENTACION**

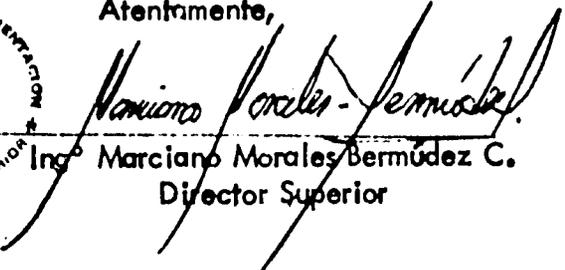
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Estimamos que para tal efecto se requerirá el concurso de personal profesional, mando medio y administrativo, para lo cual este Ministerio está contemplando la provisión de los recursos financieros necesarios para los gastos de operación de estos proyectos durante el período 1977-80, los mismos que ascienden alrededor del orden de S/ 186'000,000.00, y por otra parte se está considerando la celebración de un contrato con el PCIM para asegurar el apoyo de esta entidad.

- 4,138,333

Sin embargo, para la ejecución de estos proyectos quedan aún necesidades por cubrir que están fuera de nuestra capacidad de financiación, las mismas que están referidas a equipos para investigación y difusión, vehículos para asegurar la transferencia de tecnología a los productores, asistencia técnica y capacitación del personal técnico peruano tanto en el país como en el extranjero, lo cual garantizaría el contar con técnicos calificados para desarrollar este esfuerzo a largo plazo. Por tal razón, solicitamos la asistencia de la Agencia para el Desarrollo Internacional (AID) para cubrir el costo de estos equipos, materiales y servicios por un período de cuatro (4) años, a iniciarse en el cuarto trimestre del presente año, el mismo que alcanzaría aproximadamente U.S. \$ 2'400,000.00.

Finalmente, cabe anotar que la cooperación que se solicita a su Representada para la ejecución de estos proyectos es sumamente valiosa, pues va destinada a cubrir necesidades primarias de nuestra población.

Atentamente,

Ingr. Marciano Morales Bermúdez C.
Director Superior

