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

PROJECT PAPER

Proposal and Recommendations
For the Review of the
Development Loan Committee

527-163 Dup 527

PERU - DEVELOPMENT OF SUB-TROPICAL LANDS

AID-DLC/P-2278
(Including Selected Annexes)

UNCLASSIFIED

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

UNCLASSIFIED
AID-DLC/P-2278
January 31, 1978

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Peru - Development of Sub-Tropical Lands

Attached for your review are recommendations for authorization of a loan to the Government of Peru ("Borrower") of not to exceed Nineteen Million United States Dollars ($19,000,000) to assist in financing the United States dollar and local currency costs of a Peruvian high jungle known as the Huallage Central-Baja Mayo ("Project"). Project components to be financed are: roads, road maintenance, agricultural credits, land clearing and farm machinery equipment and services, marketing facilities and services, land surveying and titling activities, extension services, resource studies, and technical assistance.

This loan proposal is scheduled for consideration by the Development Loan Staff Committee on Wednesday, February 15, 1978, at 2:30 p.m., in Room 5951 New State. If you are a voting member, a poll sheet has been enclosed for your response.

Development Loan Committee
Office of Development Program Review

Attachments:
Summary and Recommendations
Project Analysis
Annexes A, D, E, F, G, H

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I. A. SUMMARY AND RECOMMENDATIONS

AGENCY FOR INTERNATIONAL DEVELOPMENT

A. PROJECT PAPER FACESHEET

1. TRANSACTION CODE: A (A = ADD, C = CHANGE, D = DELETE) — PP

2. DOCUMENT CODE: 3

3. COUNTRY/ENTITY: PERU

4. DOCUMENT REVISION NUMBER:

5. PROJECT NUMBER (7 digits): 527-0163

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

7. PROJECT TITLE (Maximum 40 characters): Development of Sub-Tropical Lands

8. ESTIMATED FY OF PROJECT COMPLETION: FY 84

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 78; B. QUARTER 3 (Enter 1, 2, 3, or 4); C. FINAL FY 78

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

A. FUNDING SOURCE	FIRST FY B. FX	FIRST FY C. L/C	FIRST FY D. TOTAL	LIFE OF PROJECT E. FX	LIFE OF PROJECT F. L/C	LIFE OF PROJECT G. TOTAL
AID APPROPRIATED TOTAL	7,494	11,506	19,000	7,494	11,506	19,000
(GRANT)	( )	( )	( )	( )	( )	( )
(LOAN)	(7,494)	(11,506)	(19,000)	(7,494)	(11,506)	(19,000)
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY		6,500	6,500		6,500	6,500
OTHER DONOR(S)						
TOTALS	7,494	18,006	25,500	7,494	18,006	25,500

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY 78 F. GRANT	E. 1ST FY 78 G. LOAN	H. 2ND FY — I. GRANT	H. 2ND FY — J. LOAN	K. 3RD FY — L. GRANT	K. 3RD FY — M. LOAN
(1) FN	143				19,000				
(2)									
(3)									
(4)									
TOTALS					19,000				

A. APPROPRIATION	N. 4TH FY — O. GRANT	N. 4TH FY — P. LOAN	Q. 5TH FY — R. GRANT	Q. 5TH FY — S. LOAN	LIFE OF PROJECT T. GRANT	LIFE OF PROJECT U. LOAN
(1) FN						19,000
(2)						
(3)						
(4)						
TOTALS						19,000

12. IN-DEPTH EVALUATION SCHEDULED: MM 6 YY 84

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

1 (1 = NO, 2 = YES)

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: Leonard Yaeger

TITLE: Mission Director

DATE SIGNED: MM DD YY

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM 11 DD 02 YY 77

AID 1330-4 (3-76)

PROJECT PAPER

SUB-TROPICAL LANDS DEVELOPMENT

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Annexes

* LA/DR Files

MISSION PROJECT COMMITTEE

Jimmie Stone	-	Multisector Officer
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Milton Lau	-	Agricultural Development Officer
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John Tannhauser	-	Procurement Specialist
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Donald Kidman	-	Utah State University, Irrigation Agronomist

ACRONYMS USED IN PROJECT PAPER

AGBANK	-	Agrarian Bank
COPERHOLTA	-	Cooperative Peru-Holland Project, Tarapoto
EPSA	-	Peruvian Agricultural Service Enterprise (Marketing Agency)
INP	-	National Planning Institute
GOP	-	Government of Peru
MEF	-	Ministry of Economy and Finance
MINAG	-	Ministry of Agriculture
MINFOOD	-	Ministry of Food
MTC	-	Ministry of Transport and Communications
ONERN	-	National Office of Natural Resources Evaluation
SENAMA	-	National Agricultural Machinery Service

I.

B. Recommendations:

Loan US $ 19,000,000

(Terms: 20 years, 7 years grace
2% during grace period, 3% thereafter)

C. Description of the Project:

This project will increase agricultural production in the area of the Peruvian high jungle known as the Huallaga Central-Bajo Mayo and will establish and test a methodology for achievement of optimum use of economic resources in such areas.

To accomplish these ends the project will attack a series of interrelated constraints on productivity as follows:

1. The internal network of penetration roads will be improved, expanded and articulated by the Ministry of Transport and Communications (MTC). In all, 76 Km. of improved roads, 98 Km. of new roads and two major river crossing facilities will be installed to provide access to markets.

2. Collection centers for the principal cash crops of the area will be expanded and equipped to receive and manage increased flows of commodities to established markets, thus assuring small farmer access to the cash economy. The Ministry of Food (MINFOOD) through the Public Enterprise for Agricultural Services (EPSA) will manage this activity.

3. The situation with regard to land titles will be normalized and regulated by the Ministry of Agriculture (MINAG) to assure a just distribution and clear usufruct rights to the tiller and to qualify farmers for formal production credit.

4. Medium-term farm improvement credit, primarily for land clearing, will be provided through the Agrarian Bank in addition to the short term production credit.

5. The existing pool of farm machinery will be expanded and improved by MINFOOD through EPSA-SENAMA (National Farm Machinery Service) to provide appropriate equipment at critical times in the production cycle.

6. The agricultural extension system will be equipped, expanded and trained to meet the needs of all producers in the area.

7. Resource evaluations employing appropriate remote sensing and ground-truthing operations will be conducted by the National Office of Natural Resource Evaluations (ONERN) in the project area to establish a data base for Project monitoring and a methodology for employment of remote sensing technologies to evaluate resources in similar areas. Two additional promising areas will have full resource evaluations as a result of this Project.

To achieve the foregoing outputs, A.I.D. will finance the foreign exchange costs of road maintenance equipment, farm machinery, grain handling equipment and hardware required for extension and land titling activities. In addition, A.I.D. will finance a portion of the local currency costs of road construction, medium-term farm improvement credit primarily for land clearing, river crossing facilities and aerial photography for the land titling process. Both foreign exchange and local currency costs of foreign technical assistance in farm machinery and marketing will be financed by A.I.D. Finally, A.I.D. will finance a portion of the costs of additional resource evaluations.

The Government of Peru will finance partial local currency costs of Project administration, road construction, short-term agricultural production credit, and all additional personnel costs in land titling, marketing, credit, machinery, extension and resource evaluations.

A PRP was completed during October 1976 which established a total project cost at $25 million. The Mission proposed at that time a loan of $13 million with a Peruvian project contribution of $12 million. During the intensive review for the Project it became clear that the GOP would not be able to invest $12 million in the project during its implementation cycle. As Peru's economic crises deepened other donors deferred or exempted counterpart contributions to keep their projects on schedule. A.I.D. has deferred counterpart on selected on-going projects and reanalyzed Peru's ability to contribute to implementation and maintenance costs of this Project.

Since long range projections are that by 1981 the Peruvian economy will have stabilized permitting renewed government spending, the Mission has determined to go forward with the Project at this time. However, certain changes in project design have had to be made in response to Peru's short-term liquidity crisis. Principal among these is the reduction of GOP counterpart contribution to the minimum required. The AID contribution to the project has been increased accordingly. The PP therefore recommends a loan of $19 million (75%) and a counterpart contribution of $6.5 million (25%) for a total Project cost of $25.5 million. The total Project cost throughout the intensive review was increased by only $500,000, which was primarily to provide added funds for inflation and contingencies, required by an increasing inflation rate in Peru.

Given A.I.D.'s commitment to support the GOP during this period of economic crisis, and the Project's favorable impact on Peru's balance of payments and agricultural production, the Mission believes the proposed A.I.D. loan is fully justified.

The Project design has identified and selected only those interventions that relate directly to the development of commercial agriculture on small farms in the Project area. Road improvement is essential to this development not only in the narrow sense of providing access to markets but also in providing the means for expansion of extension and machinery services and supplies of inputs and consumer goods. Land titles, or the equivalent thereof, are required to give farmers access to the credit needed to produce for the cash market. Credit, in turn, is required for expansion of land under cultivation and employment of improved production methods. Machinery is also needed in this labor-short area to break production bottlenecks in critical activities of land clearing, preparation, and harvesting. Additional marketing facilities are indispensable to ending the historical absence of a reliable and convenient market for the area's products. Coming full circle, the historical lack of markets which depressed production was a result of the absence of roads leading to those markets. This isolation has ended, providing a promising opportunity to stimulate production in the Project area. However, to capitalize most effectively on this opportunity, the basic services and infrastructure contemplated by this Project are required.

Resource studies are the only Project element not directly affecting and aiding the farmers of the area. This element is included

to (1) aid Project managers in monitoring progress, (2) refine and adapt remote sensing technology to high jungle areas, and (3) develop a low cost methodology for resource evaluation and project development in replicating this Project.

By the end of the Project, production in the area will have increased by more than 100%, based on 23,000 hectares of land cleared for permanent agriculture and continuous cropping systems. The project area will contribute significantly to the national supply of critical agricultural commodities which are now imported and the infrastructure of the Project will be operating and expanding on a self-sustaining basis. Two additional area resource evaluations will have been completed for possible replication of the Project.

D. Summary Findings:

1. Technical Analysis

The Mission and counterpart agencies of the GOP have examined in detail the form, composition and timing of Project inputs and interventions. The appropriateness of inputs and their timing were evaluated on the basis of the constraints to be confronted, the resource base of the area and the observations of expert consultants along with Peruvian and Dutch technicians who have substantial experience in the Project area. Cost estimates for machinery, equipment, construction and personnel are based on actual prices as of July 1977.

With the opening of the A.I.D. financed Rio Nieva-Tarapoto Highway in late 1977 the Project area gains access to markets for a larger volume and wider range of its agricultural products. This project is designed and timed to develop rapidly the productive potential of the area to the benefit of its present population, a smaller number of newcomers and the Peruvian economy at large. The conclusion of the Mission is that the time has come to mount a concrete development effort in the area. This is confirmed by the willingness of the GOP to help finance the Project in a period of severe fiscal constraints and the desire of implementing agencies to design and implement the Project.

Selection of the appropriate technology package which would result in an optimal economic mix given Project area conditions was thoroughly analyzed. The following discussion summarizes the results of that analysis for the two largest investment components of the Project (roads, $7.5 million and land clearing, approximately $7 million).

Analysis determining the appropriate technology for either component has three possible alternatives: (1) capital intensive; (2) labor intensive; or (3) a mix of 1 and 2. Careful examination for both

the road and land clearing components demonstrated a severe seasonal labor shortage. Periods of full and underemployment result directly from climatic patterns and the resulting agricultural cycles. During the drier periods of the year a labor shortage develops due to the seasonal demands for planting and harvesting. These dry periods, characterized by labor shortages, are the crucial period for road construction and secondary clearing, especially the removal of trunks and roots. A project design which depends on local labor for road construction and land clearing would be stymied by labor shortages. The road construction will be completed by contracts with Peruvian firms which will determine the most efficient capital-labor mix through the competitive bidding process for each individual penetration road.

The land clearing case differs in that the activity will take place on individual farmers' land. The optimal technology mix in this instance is both labor and capital intensive. The first phase of land clearing will be labor intensive with the individual farmers using hand tools to cut down the existing growth. The farmer can apply labor to this activity during the rainy seasons thereby reducing the level of seasonal underemployment currently found in the area. The second stage of land clearing will involve more capital intensive techniques to assure that the land is brought into full and permanent production. Heavy machinery will be used for log and stump removal completing the clearing process. Current experience demonstrates that farmers can and do complete the primary clearing process but cannot, given the existing labor cost and availability, complete the final clearing stage of trunk and root removal. When the final clearing is not done the farmers have weed and regrowth problems which they cannot control. The result is that farmers abandon their fields after 3 to 4 years and cut down a new area. This slash and burn technique is responsible for serious erosion problems as well as an unstable and inefficient use of some of Peru's finest arable land.

2. Economic Analysis

Macroeconomic Impact

The major constraint to the development of Peruvian agriculture is the extremely limited arable land base. Land reclamation on the arid coast has proceeded slowly, basically because of high per hectare costs associated with major irrigation works. Currently costs are running between $18,000 and $20,000 per hectare in major projects such as Tinajones in the north and Majes in the south.

Soil conditions in the low jungle area preclude extensive agricultural development in that selva region, and much of Peru's sierra is climatologically unsuited for cultivation.

The high jungle is therefore Peru's last feasible agricultural frontier for development, where relatively low cost land development is possible and economic payoffs are high. Migration to the area has occurred on a spontaneous basis, accompanied by slash and burn agricultural methods which are both detrimental to long-run environmental considerations as well as sub-optimal use of prime agricultural land. The proposed Project is a cost-effective method for rationalizing the agricultural development of the area. Costs for clearing of secondary growth is estimated at between $300 and $400 per hectare, and by improving farm to market roads, providing and improving storage and marketing facilities, improving extension services to farmers, and setting up a mechanism for medium term credit, Peru can effectively increase its total arable land base by nearly 10% in the project area alone. 23,000 hectares of land will be improved to allow for permanent cropping -- at the present time, these lands are being exploited on a haphazard basis, and because of lack of penetration roads and other marketing facilities, farmers are forced to cultivate more "durable" crops, such as tobacco and cotton, instead of greatly needed food crops which have a higher shipping costs and spoilage rates. An additional 50,000 hectares will be opened up for permanent pasture land and tree cropping. Total land in permanent agriculture is expected to be more than double these figures at the end of ten years.

Peru is currently facing an acute economic crisis, and a steadily worsening balance of payments deficit. Net international reserves have dropped to an estimated negative $1.1 billion, and gross reserves are projected to reach close to zero in early 1978. The recently negotiated IMF stand-by agreement provides for Peru to take stringent corrective measures over the next several years particularly with regard to fiscal expenditures, thereby bringing spending more in line with Peru's revenue generating capacity. The balance of payments picture, on the other hand, will continue to show substantial deficits over at least the medium-term A substantial portion of Peru's imports consist of foodstuffs. These amounted to over $300 million in 1976 and it is expected that they may reach $350 million in 1977. It is thus incumbent upon Peru to effect major increases in production over the next five to ten years if current balance of payments trends are to be reversed.

The GOP has taken steps to increase productivity in the agricultural sector, primarily through removing artifically low official prices for basic commodities and increasing agricultural extension work. The basic constraint -- lack of arable land -- continues to be a major bottleneck to Peru's desire to become self-sufficient in at least basic foodstuffs. The proposed Project aims to develop methodologies to open up, on a cost effective basis, new production areas, in order that the food gap may be diminished.

Using anticipated cropping pattern data developed for the Small Farm Budget analysis (See Section III B), calculations on overall production potential of the project region have been extrapolated. On the 23,000 hectares of land which will be available for permanent crops, gross value of production has been calculated to be approximately $550 per hectare. The gross annual value of production on all 23,000 hectares thus is estimated at approximately $12,650,000 at the end of five years and more than $25 million by year ten. In the case of permanent pasture land, which will be used for either grazing and production of milk and beef or cultivation of tree crops, the gross value of production per hectare was calculated to be approximately $305, thus giving a total annual value of production on 50,000 hectares, of $15,250,000 1/ at the end of five years and $30.5 million at the end of ten years. It is anticipated that yearly value of production by year ten will therefore be approximately $60 million, representing roughly 20% of the value of food imports during 1976. Since the bulk of this agricultural production is in crops currently being imported -- soya, rice, sorghum, meat and milk -- the Project will have a direct import substitution effect and a significant favorable impact on Peru's balance of payments.

Microeconomic Impact

The Mission employed standard "with project" and "without project" farm budget analysis for crop and livestock farming operations to provide a year end cash balance and an on-farm net benefit for typical farms. With shadow priced labor and project costs factored in, the foregoing tests were used to produce a net economic cash flow to determine whether the investment would be an efficient use of resources. The results are as follows:

1/ This figure is considered to be low, since farm budget model did not consider tree crops which have a high production value after plantations have matured. Milk and meat were taken as surrogate values for all permanent pasture and planation land.

On-Farm Net Project Benefits

	IRR
Year-End Cash Balance	
Crops	>50%
Livestock	>50%
On Farm Net Benefit	
Crops	>50%
Livestock	>50%
Net Economic Cash Flow	
Crops	34.09%
Livestock	40.74%

The conclusion of the Mission is that the Project represents an exceptionally attractive use of capital resources. Sensitivity analyses confirm that Project economic viability would be sustained even with significantly higher costs, lower yields, reduction in cultivated land, and an increased rate of interest.

3. Financial Analysis

Analysis and consultation with implementing institutions have produced the conclusion that the Project is within the means of the GOP to finance and maintain. However, Peru is in a period of austerity in which it must husband carefully its counterpart resources and limit even concessional borrowing to projects that promise substantial, early economic benefits. Though some offers of assistance are being deferred, the GOP has sought A.I.D. assistance and committed its own scarce resources to support this Project.

Taking into account the scarcity of financial resources in the present period of extreme austerity the Mission has attempted to defer heavy host country contributions until the third year of the project. Current expectations are that the balance of payments will improve, inflation will slacken and productivity will be on the rise by that time. The combination of these factors will permit GOP contributions to be made in full.

The Mission has concluded that the increased expenditures occasioned by this Project are affordable within the context of the various Ministerial budgets involved, particularly once the productivity of the area has been established and linked to the national economy. The following table summarizes the Project's financial plan:

Summary Financial Plan
(Thousands of U.S. Dollars)

		TOTAL			TOTAL
1.	Penetration Roads	7505	6.	Land Surveying & Titling	820
2.	Road Maintenance	1416	7.	Extension Service	1148
3.	Medium-Term Credit	4730	8.	Resources Studies	120
4.	Machinery Parks	3725	9.	Project Direction	490
5.	Marketing & Collection Centers	840	10.	Technical Assistance	1570
				Sub-Total	22364
				Plus: Inflation Factor and Contingencies	3136
					25500

4. Social Analysis

The major social impact of this Project will be gradually to eliminate the practice of slash and burn agriculture which engenders subsistence production and a semi-nomadic way of life and to establish stable ownership and cropping patterns within a system of commercial agriculture on small farms. The social analysis concludes that, given the composition of the population, the probable influx of new settlers and the visible responses to market opportunities in the recent past, the farmers of the area will respond to the stimuli provided by this Project.

The social soundness analysis pointed out a probable need for work in environmental sanitation and nutritional education in order to improve the health of the work force and to realize the full benefits of increased productivity and incomes. As a result, the Mission invited a PVO to further analyze the need for such a program and earmarked funds for a possible OPG for this purpose. The OPG will go forward on its own humanitarian merits with or without this Project.

E. Project Issues

The Sub-Tropical Lands PRP was reviewed and approved by the DAEC in November 1976. The following listing of issues developed at the PRP review indicates the section of the paper where they have been discussed (see Annex A for a copy of the PRP issues cable):

1. Project Strategy. See Part III, A 2; and Part IV, C.

2. Infrastructure Analysis. See Part III, A 2; and Annex B. Exhibit 1.

3. Road Component. See Part III, A 3-4; Part IV, A 4; and Annex B : exhibit 1.

4. Land Tenure. See Part II, B; Part III, A & C; and Part IV, A.

5. Target Group. See Part II, A & B and Part III, A & C. The Mission has concluded that AGBANK lending criteria are appropriately geared to benefit the target group. Further, limitations on agricultural machinery services (A.I.D. loan funds would be used exclusively for land clearing) relating to the amount of land cleared or prepared for individual farmers will assure appropriate distribution of project resources. Marketing and machinery facilities are being decentralized and located in areas of maximum concentration of farm land and target group farmers which have previously lacked such infrastructure. The geographical reality of the area (its division into distinct valleys containing farm populations without road access to markets) has dictated the location and allignment of roads.

6. Project Implementation. See Part III, A.

7. Appropriate Technology. See Part III, A; Part IV, A; Part IV, A & B and Annex B; exhibit 1.

8. Subsidies. See Part III, A & B.

9. Technical Assistance. See Part III, B; and Part IV, A.

10. Intermediate and Long Term Credit . Issue resolved in Mission's interim report.

II. PROJECT BACKGROUND AND DETAILED DESCRIPTION

A. BACKGROUND

1. Introduction

As articulated in the most recent ABS submission, USAID's development assistance strategy in Peru is: a) to improve the quality of life of the sierra poor through on and off-farm employment; b) to accommodate rural migration by supporting the orderly, economic development of new agricultural lands in the high jungle and the provision of basic services and job opportunities to the urban poor; and c) to stimulate and strengthen institutional innovation and reform. The strategy, which is responsive to the immediate human needs of Peru's most depressed area, also acknowledges that the long term development potential for A.I.D.'s target group lies in such areas as the underdeveloped high jungle. Harsh natural conditions, constraints of land tenure, and scarcity of physical and administrative infrastructure in the Sierra sharply constrain the long-term growth potential in the Sierra. Investment in the Sierra, then, can only be designed to meet the short and medium-term need of providing employment and income to a marginal population. It is also necessary to promote growth in other, potentially more productive areas to absorb the surplus labor from the Sierra.

The Mission wants to further development of the high jungle as one of these more productive long-term growth sectors for two reasons. First, given the existence of trunk roads in the region, economic returns on additional investment in the potentially productive farming areas of the high jungle are probably higher than equal investments in the coast, where agriculture is already highly capitalized and it is very expensive to bring new land into production. Second, these economic returns will no doubt benefit the poorest elements of the population in view of the particularly close economic and demographic relationships which exist between the high jungle and the Sierra. Most notable of these relationships is the pattern of migration of those who leave the Sierra in search of land and employment. A project which facilitates this migration, channels it into productive uses, and rewards it with higher incomes, benefits not only the immediate recipients in the high jungle and future out-migrants from the Sierra, but also those who can then afford to remain behind in the Sierra owing to a more favorable man-land ratio.

The Project thus falls squarely within the second thrust of USAID's development assistance strategy. In addition, the Project will complement and be complemented by several important USAID/GOP programs and projects. The most obvious complementarity is with the soybean program of production in the high jungle areas. Accelerated

settlement will help facilitate achievement of long range soybean production targets. Soybeans will stabilize farming patterns by helping to maintain soil fertility, thus contributing to a major objective of settlement programs. Another USAID project, now in the PID stage, will support the development of intermediate cities and market towns. Both Housing Investment Guarantee and Development Loan funding have been proposed to improve GOP regional planning and to establish a financing and institutional mechanism for serving the needs of smaller urban places with strong urban/rural linkages. The proposed program would be focussed on a small group of perhaps five market towns, and Tarapoto is a strong candidate for selection under the program. Finally, the recently authorized loan (527-T-060) to establish a Rural Development Agribusiness Fund (Fund) will also complement the Project. Several agribusiness opportunities in the Tarapoto area have been identified as potential subprojects for Fund financing. Such investments could provide additional incentives to increase agricultural production in the area by facilitating the processing and marketing of agricultural products.

2. Agricultural Sector Overview

Peruvian agriculture has long been confined to a limited amount of arable land dedicated to intensive commercial farming in narrow coastal valleys and to the Sierra where mostly subsistence agriculture is practiced under harsh environmental conditions and extreme population pressure on land and water resources.

Under these conditions in the present decade per-capita agricultural production in Peru has fallen. While the official population growth rate remains steady at three percent, the record of food production reflects the following:

ANNUAL INCREASE IN VALUE OF PRODUCTION

1971	1972	1973	1974	1975	1976
2.6%	1.0%	2.4%	2.3%	1.0%	3.0%*

The agricultural sector's contribution to Gross Domestic Product also declined from 15% in 1969 to 12.7% in 1975 while continuing to employ about 42% of the country's labor force. This virtual stagnation in productivity has pushed up food imports to record levels. The value of total agricultural imports in 1971 was $150.0 million. In 1975 the value was $400.0 million and in 1976, $341.0 million, contributing to the heavy net balance of trade deficits of recent years. In 1976 the deficit on the agricultural trade account was $33.0 million.

The major physical obstacle to increased agricultural production is the relative scarcity of arable land per capita. Only 2.7% of Peru's total land area is suitable for cultivation, according to USDA Soil Conservation Service standards presently in use. The 1975 World Bank Agricultural Sector Survey estimated that some 400,000 hectares remain available for exploitation, mostly in the high jungle (Ceja de Selva), which holds some 300,000 hectares. Coastal agriculture is already developed to a high degree, though gradual production increases per hectare are possible and irrigation systems can be developed for some additional lands at a high cost. Production can increase only marginally in the harsh environment of the Sierra where land resources are already over-used and deteriorating.

According to Peru's 1975-78 development plan, five principal factors influence the selection of projects for investment of financial

* Preliminary

resources, both domestic and foreign, in rural development. These are: (a) The ability to provide income and employment for a growing rural population; (b) the supply and demand for agricultural products; (c) the need to cover food deficits; (d) the extent to which existing unused potential can be realized through investment, and; (e) the extent to which investment resources can be used to achieve broad economic and social equity goals.

Despite the fact that the only substantial amount of good agricultural land in Peru remaining unused or underused outside the arid coastal desert is located in the Ceja de Selva east of the Andes, efforts to develop the area have been hampered primarily by a lack of land transportation routes which limits the entry of settlers and inputs, and inhibits marketing. Lack of experience in sub-tropical agriculture on the part of settlers, the need for more effective technology transfer and credit systems, inadequate storage facilities and lack of mechanization also prolong the existence of subsistence agriculture in this area of great productive potential.

The exploitable portion of the Ceja de Selva includes four major areas: the upper Mayo, the Huallaga Central and Bajo Mayo, the Central Selva and the San Ramón-Satipo area. These are identified as the "economic frontier of Peru" in the 1975-78 National Development Plan. All except the Central Selva have settlers living close to trunk roads and navigable streams, practicing forest-fallow agriculture, permanent agriculture, and livestock raising. All of these areas are characterized by relatively low population densities and a high level of agricultural potential which is not fully exploited and, in some cases, not adequately studied. According to the national plan these areas are to be incorporated as new productive resources into the national economy and attract migrant populations from economically deprived areas. The climate, soils, and water resources of Ceja de Selva make it the only remaining major area of appreciable productive potential that can be tapped using available technology. Because the area lies between 500 and 2000 meters in elevation and because it experiences less rainfall than the low jungle it has a productive potential associated with semi-humid sub-tropics. The area is thus free of many of the soil fertility and disease problems associated with the low jungle.

The last ten years have seen a push to build trunk roads linking the Ceja de Selva with the populous markets of the coast. San Ramón and Satipo now enjoy a road link with Lima which can be traversed by truck in one day. The upper Huallaga river valley, centering on Tingo María, enjoys similar access and the marginal

jungle highway tying the north coast to the upper Mayo and lower Mayo/ upper Huallaga Central is now open for intermittent traffic. In early 1978 it will be completely operational. The remaining Ceja de Selva area, one with perhaps the most potential in lumber, livestock, and agriculture and the greatest capacity to absorb and employ population from crowded areas is the Central Selva zone. However, there is currently no land route to this area and there are no roads within it. A trunk road is being built but the rate of construction is slow. At the present rate of construction there will be no access until 1980, except by air or river boat.

While the Ceja de Selva remains under-exploited, poverty in the Sierra persists, the price of domestic food rises along with accelerated food imports. Efforts to boost production in the coastal area are increasingly expensive and bring lower returns as the most favorable opportunities are exhausted. Harsh physical conditions and an unfavorable ratio of land to population argue against overloading the Sierra with development resources which may not be readily absorbed. By contrast, the Ceja de Selva's unused resources and low population density invite development investment as land linkages with coastal markets become a reality.

For these reasons development of the Ceja de Selva has gained a high priority in recent years. The area meets the tests of productive capacity and ability to absorb population. It can provide opportunity for achieving social equity through development measures that are difficult to attain in the over-crowded coast and sierra. It is important to note that, in adopting for the first time a comprehensive population policy, the GOP recognized the need to settle sparsely populated zones so as to create new areas of agricultural and industrial development and to support decentralization within a policy of regional development.

There are few, if any, opportunities for investment in Peru's rural sector which meet the established criteria as well as investments in the Ceja de Selva. The area can produce a wide range of commodities which are now imported and it can absorb large numbers of rural people from crowded areas. With basic rural services and transportation facilities it is possible to raise the level of living both for its present sparse population and for newcomers. Because the incomes of the present rural population are nearly as low as those of prospective new settlers and because there is a clear opportunity for raising those incomes to the benefit of the entire Peruvian economy, this project is particularly attractive from the standpoint of GOP policy and is consistent with AID's mandate.

Although the Project area is in the lowest quintile of the USAID's poverty study (a composite of 10 factors, including, inter-alia, income, housing and education was used) it has long been marked as an area of outstanding agricultural potential. The combined Huallaga Central and Bajo Mayo areas encompass a substantial portion of Peru's best land, as shown below:

Table (IIA)I
Available Crop Land by Class and Percentage in Project Area

Class	Total* PERU		In Project** Area		%in Project Area
I	177,000	hectares	14,852	hectares	8.3
II	532,000	"	49,087	"	9.2
III	1,100,000	"	47,868	"	4.3
IV	1,800,000	"	18,569	"	1.0
V-VI	15,700,000	"	88,857	"	.5

* Source: World Bank Agricultural Sector Assessment, 1975.
** Source: FAO Study of Project Area, 1973.

Climatic conditions are nearly ideal. Annual rainfall varies between 819 mm and 1518 mm and is generally distributed evenly throughout the year, permitting double cropping on most of the land. The average annual mean temperature is 25.4 centigrade with a high of 26 in December and a low of 24.3 in July.

Given these conditions it is understandable that the Project area has been the subject of intensive study and a source of hope for development planners. In 1960 a study of agricultural potential was completed by SCIPA (Servicio Cooperativo Interamericano de Producción de Alimentos) and the International Cooperation Administration in order to support development of a road network. This study covered all of the Department of San Martín, and identified the Project area as suitable for immediate development. While for most of the Department the study was only a profile or reconnaissance, it included detailed studies of population and soil characteristics in the Huallaga Central/Bajo Mayo area. It also attempted to identify appropriate areas for specific crops. At the time of this study San Martín counted a population of 150,000 and, based primarily on productive capacity in the Project area, a population of 1,000,000 was predicted.

As an outgrowth of the SCIPA Report, a more intensive study of the Project area was undertaken by FAO and was published in 1970.

Using detailed soils studies, the FAO Report confirmed much of the earlier information and suggested an ambitious multi-sectoral development scheme which would have included elements of hydro-electric power, housing, education, roads, extension, and marketing. The total investment required was more than $237,000,000 in 1970 dollars with $123,339,000 to come from concessional loans.

Clearly such levels of investment were not to be found for a single project in an isolated, sparsely populated region. (In 1970 construction was stalled on the Tarapoto-Rio Nieva highway which was designed to end the isolation of the area.) Nevertheless, individual elements of the proposed investment were and are advisable. Of particular value were the suggested investments in productive activities e.g. credit, transportation, extension, research, and land tenure. For the long term development of the area, its natural hydro-electric potential should also be tapped, as the FAO Report recommends. It appears, however, that the total investment deemed necessary was bloated by the inclusion of expensive social infrastructure. At any rate, no action was taken to secure financing for the region.

In 1977 the COPERHOLTA (Cooperative Peru-Holland Technical Assistance) project personnel developed a proposal for accelerated development of the region. The preparation of the proposal followed the submission of the USAID PRP and contains most of the same project elements which were presented to AID/W in November, 1976. In addition the COPERHOLTA document suggested investment in campesino training facilities and agro-industrial units. It omitted investments to solve land tenure problems and differed from the PRP estimates of relative investments in various project elements. The differences between the two very similar project proposals were resolved during the intensive review, the results of which are included in this Project Paper.

B. DETAILED DESCRIPTION (See Logical Framework Annex D)

1. Goal

The goal of Peru's agricultural sector is to increase productivity, incomes and employment in the agricultural sector. This Project contributes to the goal by seeking significant per capita productivity increases in an area which contains nearly 10 percent of Peru's best agricultural land by bringing more land into production both through the expansion of existing farms and the establishment of new farms and by increasing rural employment, all of which will be verified by Project and National Census data. In expanding the farming

area and establishing new farms the continued mobility of the agricultural labor force is assumed. No direct effort will be made to organize new settlement; however, land titles and other essential services will be available to new-comers now filtering into the Project area at the rate of four to six families per day. Not all of these are prospective settlers in the near term. Some are migrant laborers who may later return to claim land.

Another assumption important to the achievement of the goal is that prices in the agricultural sector will keep pace with the rest of the economy. It is believed that the products of the Project area will continue to enjoy attractive market prices since the principle crops are supported by official prices and are important to Peru's balance of payments. Moreover, growing population centers are creating a high demand for a wide variety of secondary crops.

2. Purpose

The purpose of this Project is twofold. First it is intended to increase agricultural production. Second it is to establish and test a low-cost methodology for achieving optimum use of land labor and capital in the high jungle. This will be accomplished by an expected increase of more than 100% in agricultural production based on the expansion of land in crops to 69,000 hectares (from the present 43,000), continuous cropping of at least 23,000 of these hectares, and establishment of permanent pastures and tree crops on another 50,000 hectares. Credit and extension services will be made available to at least 15,000 farmers on a regular basis. In addition, the Project, by the time of its completion, should have produced two feasible plans for replication of this project in similar areas of Peru where resource studies based on data and experience gained in this project have been conducted. Evaluation of this Project should provide valuable planning data for replication.

To verify the end of Project status and achievement of purpose, remote sensing may be employed with ground-truthing to determine actual land in crops, by crop type and by season. Such data will be supported by MINFOOD, AGBANK and Project records and surveys.

Assumptions critical to achievement of Project purposes are: (a) that trunk roads leading to major markets remain open to permit EPSA (or private buyers) to purchase area products; and (b) that there will be no major climatological disruptions beyond a possible year of semi-draught during the life of the Project.

3. Outputs

Outputs of the Project will be an improved, expanded and articulated road system linking the major valleys of the Project area to the trunk highway. In all, 76 km. of roads will be improved by surfacing for all-weather traffic, installing or repairing culverts, bridges and ditching. Another 98 km. will be constructed with minimal all-weather surfacing, drainage and ditching. Then, to link the valley roads south of the Huallaga (See Map, Annex II) with the trunk road located north of that river, dependable river-crossing facilities will be provided in the form of flat bottomed, shallow draft, diesel powered transport barges.

Certificates, titles and contracts giving right of occupancy to the land will be issued or verified and registered for about 15,000 farm families in the zone - the 11,200 now in the area and an additional 3800 expected to settle. It is universally agreed that this step is necessary to stabilize farming and qualify farmers for formal credit through the AGBANK. The credit system (AGBANK) will be improved by establishing two new offices, increasing autonomy of operations, adding personnel and providing transportation and ancillary equipment. In addition, a special fund for land clearance sub-loans will be established, short-term production credit will expand and other medium to long-term farm improvement credit will be made available through a World Bank loan.

The Project will establish one farm machinery center and three sub-centers equipped with tractors, implements and maintenance capacity to clear 23,000 ha. during the life of the Project and prepare for planting the same amount of farm land on an annual basis. Long-term technical assistance will be provided to make this activity self-sustaining and capable of expansion from its own resources. The centers will also provide harvesting services in the form of simple stationary threshers. Soil preparation and harvesting have been the two serious bottlenecks in the labor-short Project area. Moreover, as the land under continuous cultivation expands, labor scarcity will continue to be a fact of life. One effect of the machinery service will be to enable more farmers to plant and harvest more crops and to make more efficient use of scarce labor in the intermediate tasks of tending them.

The Project will create a network of collection centers from the present two installations with 4,000 MT storage capacity to a system of four facilities with 9,000 MT storage capacity and improved systems for cleaning, drying, loading, handling and shipping

grain. Lack of markets has depressed production in the past. EPSA, though officially committed to, and financially capable of, buying specific commodities, had no economical means of storing or shipping those commodities to outside markets. Hence it has had to turn away prospective sellers or risk heavy losses. To attain the purpose of increased production, this bottleneck must be broken.

The extension service will be expanded gradually from its present 40 extension agents to a total of 70, backed by 20 agronomists now working in the Project area. Preliminary estimates of the number required were much higher - about 130 - but the concensus of project planners and administrators is that a better trained, well equipped service with fewer agents would serve more efficiently the need of Project area farmers. These are being formed into "producers' nuclei", groups of farmers with similar interests and needs, in order to use more economically the scarce manpower available to the extension service. The Project will provide vehicles and improve the roads needed for the agents to reach the nuclei. A project of the Government of the Netherlands, COPERHOLTA, has trained most of the agents now in the area and will gear its future efforts toward agronomic research and training of new personnel.

A final output of the Project will be two resource studies of similar high jungle areas for replication of the Project. Remote sensing and on site verification of satellite imagery will be employed, if feasible, to improve the ability of ERTS or similar systems to identify and map soils, gradients, ground water, roads, trails, crops, vegetation and other aspects of the resource base. When ground-truth is established such systems should be able to provide project administrators with accurate, timely information on the area planted to all crops, the status of those crops and their probable yields and times of harvest. This data can then be stored, refined and retrieved to be applied to resource analysis of similar areas, thus reducing the cost of resource evaluation in planning. (At least $4.0 million in 1970 dollars has been spent on the various resource evaluations of this Project area.)

Critical assumptions of the foregoing outputs are (1) that a minimum amount of loan financed technical assistance in the fields of marketing facilities and farm machinery will be available and acceptable to the GOP; (2) that, the current severe austerity measures of the GOP will permit hiring new personnel for the Project area by 1979; and (3) that conflicts over land tenure will be minimized.

All three assumptions have been discussed at length with the appropriate Ministries and planning authorities. Regarding the

first assumption, the need for technical assistance in machinery and marketing is recognized and accepted as a necessary use of loan funds. It is agreed that the cost should be kept to a minimum and, as one possible means of reducing Technical Assistance costs, the Project may attempt to combine equipment purchases and Technical Assistance in the same procurement package.

Regarding new personnel, the bulk of the costs will relate to approximately 30 additional extension agents. The Project design delays this expansion until 1979 and 1980, thus postponing added costs to the GOP until midway in the Project. At a maximum the annual addtional costs for extension services are under $100,000, an acceptable level at that time.

Disruptive conflicts over land tenure are unlikely to occur on a significant scale. Some large holdings may be reduced in size but, according to law, farmers are allowed to hold most of the land they are actually using. Under the Project, MINAG will be able to identify unclaimed or abandoned land and direct newcomers to it, as is now being done informally. One other factor that will reduce conflicts is that the titling procedure will be undertaken on the basis of blocks of land and groups of farmers. Disputes, should they arise, will be settled on the spot by competent authority through consultation in the community.

4. Inputs

Inputs for the variety of project components are summarized in the logical framework, Annex D. During the later stages of the project design a procurement specialist was contracted to develop a detailed equipment list.[1/] This listing will be used by the Project Committee to expedite procurement activities once the project's conditions precedent have been met. The logical framework input section presents a summarized version, due to the length and detail of the procurement list developed during the intensive review.

1/ Available in USAID files

III. PROJECT ANALYSES

A. TECHNICAL ANALYSIS

1. General

The Project is intended to provide economic infrastructure to a potentially rich agricultural area which, in 1978, will have unrestricted access to markets for the first time. Further, the Project is designed to stabilize and modernize agriculture to provide an economic basis for financing social infrastructure at a later time.

Six basic, related interventions of an economic character have been identified in a series of studies of the project area. In the process of selection, other interventions such as health, education and sanitation were examined to determine if their present state of development would present an obstacle to economic growth and, if so, what steps should be taken to overcome the impediment. It was determined that primitive potable water and waste disposal systems may present a health hazard in certain rural communities. Though there is little recognition of the problem among the people of the Project area an evaluation of the magnitude and character of the problem leading to a specific project for its solution was deemed necessary. Therefore a U.S. voluntary organization with experience in this field was invited to investigate the possibility of an OPG to provide environmental sanitation systems and education. Reactions were positive and a preliminary field evaluation has been made. A provision for this activity appears in the Mission's Annual Budget Submission. The OPG will function under a separate arrangement with the Ministry of Health which now maintains over 40 medical posts and three hospitals in the zone. Both the Ministry of Health in Lima and health officials in the zone have indicated full support for pilot activity which can be expanded if experience dictates.

Educational services are adequate, comparing favorably with other regions of Peru. The average teacher/student ratio is 1/37 in the Project area as a whole. Primary and secondary education are widely available. In addition, one normal school prepares teachers, three Agricultural High Schools produce mid-level agricultural technicians, and the Ministry of Education plans to open a Superior Education School in Tarapoto, the principal population center of the area.

This Project concentrates on conventional, interrelated interventions that are basic to creating a market-oriented agriculture in what is now a semi-populated area of subsistence farming. Each of the technologies to be applied have forward and backward

linkages one to the other, and attack a series of constraints that have combined to inhibit economic progress in the zone. It is essential to understand the context in which these interventions will be applied. The Project encompasses an area which is already sparsely settled and has a growing population which is engaged in farming and livestock production operations. Nearly all farm activities have a subsistence orientation and many are semi-nomadic in character, creating confused tenure patterns. Labor is seasonably in short supply. Farm machinery and even the use of animal power is virtually absent except in transportation. Roads are few and poor; markets are distant and limited in absorptive capacity. Use of agricultural credit is confined to less than a third of the farm population because it depends on the existence of cash markets and stable land tenure patterns. A minimal extention infrastructure has been created to respond to the foregoing set of conditions. Virtual isolation and the absence of highways linking this area to wider markets have, of course, been the principal obstacles to development Because the isolation will be broken in early 1978 it is believed that the Project is timed appropriately to attack the remaining constraints.

The Project is not a colonization project. No attempt will be made to organize or encourage in-migration even though the best available judgements indicate that there will be a net gain of 3-5,000 families as a result of migrations that have already begun. The Project will, however, be able to accommodate the present population and newcomers with land titles or certificates of possession and other services on an equitable basis.

2. Timing and Coordination of Project Sponsored Interventions

With the foregoing concepts in mind, the Mission, in concert with the MinFood, INP and other agencies, has examined carefully the project inputs to assure timeliness and complementarity and to identify degrees of inter-relationship between project elements in phasing project inputs. The purpose was (a) to identify which Project elements must be implemented rapidly in order for the project to achieve its purposes and goals and; (b) to identify elements which should be implemented later or step by step in order to achieve greater returns on actual funds invested. The procedure used was to establish broad categories of interdependence and, within those categories, to assign numerical scores from zero to ten. In Table (III A) I II below, Project elements appear in the vertical column. The same elements, this time denominated "counterpart elements" appear in the horizontal row. Reading across the table provides a judgement on the extent to which each element (counterpart element) affects each other element. The vertical columns give an overall judgement

Table (III A) 1

INTERDEPENDECE OF PROJECT ELEMENTS IN PHASING OF OUTPUTS

Element	Counterpart Element: Roads	Mach.	Cred.	Ten.	Ext.	Res.	Mkt.	Dependence Score
Roads		N_o	N_o	N_o	N_o	N_o	N_o	0
Machinery	P_6		H_{10}	S_2	S_3	S_2	S_3	26
Credit	P_4	P_4		H_9	P_3	N_o	H_8	28
Tenure	S_2	N_o	N_o		N_o	N_o	N_o	2
Extension	P_5	S_2	S_3	S_2		P_7	S_2	21
Research	S_1	S_1	S_1	N_o	S_2		N_o	5
Marketing	P_5	S_3	S_3	N_o	S_1	N_o		12
Numerical Impact Score	23	10	17	13	9	9	13	

H = Heavy Interdependence: Element cannot meet any targets without prior implementation of counterpart Element or collateral implementation. (8-10)

P = Partial: Element would be limited significantly in meeting its targets by failure to implement counterpart Element. (4-7)

S = Slight: Effectiveness of Element in contributing to purposes and goals would be reduced by failure to execute counterpart Element. (1-3)

N = NONE: Element is independent of counterpart element. (o)

on the importance of specific counterpart element to achievement of the overall Project purposes and the success of other Project elements. The impact score shows the degree to which the entire Project depends on any given element. The dependence score at the end of the horizontal row shows the degree to which the implementation or success of a particular element depends upon the other Project (counterpart) elements.

Conclusions to be drawn from this model are (a) the higher the impact score, the more rapidly an element should be implemented because other elements depend on it for success and (b) the lower the dependence score, the more rapidly the element can be developed without reference to other factors.

The Project elements can then be ranked according to scores, as follows:

Element	Impact	Dependence
Roads	23	0
Credit	17	28
Tenure	13	2
Marketing	13	12
Machinery	10	26
Extension	9	21
Research	9	5

Conclusions

a. Roads and river crossing facilities are critical and must be developed as rapidly as possible. They can be built independently, without waiting for other Project elements.

b. Land tenure problems must be attacked immediately. The use of credit and, in turn, the employment of machinery depend on rationalization of tenure. The problems associated with tenure can be resolved without reliance on other project elements.

c. Research should go forward with minimal dependence on other project elements. (This is a continuing activity of the COPERHOLTA Project).

d. The marketing (collection centers) element is important to the functioning of the whole Project but depends on other elements to enable it to work at full capacity. This element can be developed gradually or in phases.

e. The extension system should expand gradually as roads, credit, machinery, secure tenure, and markets increase the effectiveness of extension services. An immediate build-up of personnel early in the project would gain little. However, means of transportation should be secured for the agents now working in the area. Other supporting equipment should also be procured early.

f. Full use of medium-term, land clearing credit is highly dependent on markets and land tenure and will be influenced by several other project elements. Credit is critical to expanded use of farm machinery. A small initial disbursement of credit funds for sub-lending should be made to accommodate existing demand. Thereafter, gradually larger disbursements should be made according to the progress of other elements.

g. Machinery services should expand gradually. The Project should start by constructing and equipping operations centers which will serve areas of greatest productive potential. These centers will permit greater efficiency of operations by decentralizing maintenance and repair services. When progress on roads and land tenure is apparent, tractors, trucks and other equipment should be procured. The total amount of tractors and related equipment should be divided into at least two parts with one delivery in the second year of the Project and one in the third or fourth.

3. Technologies to be Applied

(a) Roads (See Map, Annex B Exhibit I)

(i) Current Situation

There is only an informal system of transportation pricing within the Project area. Prices vary according to the needs and means of shippers, the condition of the roads at the time of shipment, alternative modes (boat, truck, mule or horse) available and the supply of vehicles and fuel.

Transportation costs are generally high, whether paid in cash or performed "in kind" as in the case of producers who spend several days going to and from markets with one or two mules loaded with small quantities of grain. Isolated farmers sell their corn at S/. 4.00 to middlemen who are willing to undertake its transportation to market where its value is S/. 12.00/Kg. The S/. 8.00 profit is often representative of the real transportation cost from isolated farms to central markets. Where roads are bad, truckers are willing to enter only at a high price and producers are willing to sell for cash far below guaranteed prices to avoid making several long round trips to market with small amounts of grain.

Reasonable and predictable transportation prices prevail only along established all weather roads between major population centers and between airports which permit the use of light planes. In the latter case there is a load limit of 600 Kg., insufficient for more than a trickle of agricultural products. At a cost of S/. 7,000/hr. a light plane carrying cargo from San José de Sisa to Tarapoto (one hour round trip including take-off, landing and loading) would have to charge S/. 5.00/kg. for such cargo, if 50% backhaul savings are assumed.

Secondary rivers which feed the Huallaga carry boat traffic only in the wet seasons. Dug-out canoes with outboard motors can haul up to 500 Kg. during these times at a cost of S/. 2,000/day, including fuel, maintenance and payment of the operator. The time required for the return trip is charged to the shipper. Thus a shipment from San José de Sisa to Bellavista, a distance of 50 Kms. by river would cost about S/. 4.00/Kg. in addition to the cost of the time of the producer who would have to accompany the shipment in order to sell it. Moreover the risk of damage to the shipment from leakage, spillage or rain adds to the cost. Even this costly and risky means cannot be used when river levels are low as they are in June, July, November and December, months coinciding with harvest times because of the dryer weather. It is little wonder that farm gate prices of grains in isolated areas are as low as one-third of their market price.

Within the project area existing road network consists of:

- The central highway, called the marginal jungle highway which connects Juanjui in the South to Tarapoto in the North following the Huallaga river. A loose-surface all weather road, this 35 Km. stretch of highway carries car and truck traffic year round.

- A dry weather dirt road from Sacanche near Juanjui on the marginal highway, North-west to Saposoa, a distance of 19.6 Km.

- A dry weather dirt track beginning at Pucacaca on the marginal highway and leading 10.3 Km. westward.

- A dry weather, dirt road from Bellavista to San Pablo in the Sisa River valley and connecting with the marginal highway. This 34 Km. road is in poor condition and in need of extensive repair, drainage works and bridges.

- A privately constructed 35 Km. dirt road in the Ponaza River Valley. This road starts South of the Huallaga. It does not connect with the marginal highway.

- A dirt track from Buenos Aires, on the marginal highway, westward 21 Km. to Paujilzapa following the river of the same name.

- A system of marginally all weather roads connecting Lamas, Cunumbuque and Tarapoto through the linkage of the marginal highway. These total 21 Km. in the vecinity of Tarapoto.

- A new road under construction from Shapaja to Chasuta.

External roads leading to larger coastal and jungle markets are:

- The Tarapoto-Rio Nieva highway, now in its final stages of construction, which links the zone with Trujillo and Chiclayo on the North Coast.

- The southern extension of the marginal highway which leads from Juanjui through Tingo Maria to Lima. South of Juanjui this all weather highway is not serviceable because of a lack of bridges. The Ministry of Transportation and Communications estimates that two to three years will be needed to bring this road into service.

- The highway from Tarapoto to Yurimaguas. This route has served as the most important exit for products of the zone. Goods have been hauled to Yurimaguas to be loaded on boats bound for Iquitos or Pucallpa. In the latter instance the cargo is reloaded on trucks for the trip to Lima. This 160 Km. is increasingly less serviceable. Thus far in 1977 it has been completely intransitable for two periods sufficient in duration to occasion emergency airlifts of fuel to Tarapoto and of corn from Tarapoto to Yurimaguas and Trujillo.

Costs of transportation are divided into two categories- those within the zone and those between the zone and larger markets. These categories are further divided into costs for land, water and air transportation, as shown in Table (III A) 2.

Within the zone, estimates are based on specific known costs between Tarapoto and Juanjui for land and river transportation and on known light plane fares as of June 1977. Where transportation exclusively by one means is impossible, i.e. where combinations of air, river or roads must be used, no estimates are attempted.

Table (III A) 2

TRANSPORTATION COSTS

		TARAPOTO	LAMAS	PUCACA	PICOTA	CUZCO	BELLA-VISTA	SAN JOSE DE SISA	JUAN JUI	SAPO-SOA
TARAPOTO	*Land		.25	.50	.50	-	.75	-	1.00	2.50
	**Water		-			6.00	2.00	5.00	-	-
	***Air		-			-	4.00	5.00	1.80	6.00
LAMAS	Land	.25		.75	.75	-	1.00	-	1.25	2.75
	Water	-		-	-	-	-	-	-	-
	Air	-		-	-	-	-	-	-	-
PUCACA	Land	.50	.75		.25		.50	4.50	.75	2.00
	Water	.50				4.00			.75	-
	Air	-				-				-
PICOTA	Land	.50	.75	.25		-	.50	-	.75	2.00
	Water	.50	-	.25		4.00	-	3.00	.75	-
	Air		-	-		-	-	-		-
CUZCO (Biabo Valley)	Land	-	-	-	-		-		-	-
	Water	8.00	-	6.00	6.00		4.00	8.00	6.00	8.00
	Air	-	-	-	-		-		-	-
BELLAVISTA	Land	.75	1.00	.50	.50	-		-	.50	2.00
	Water	.75	-	.50		4.00		3.00	.50	-
	Air	5.00	-	-		-		3.00	1.00	-
SAN JOSE DE SISA	Land	-	-	-	-	-	-		-	-
	Water	5.00	-	3.50	3.00	8.00	3.00		5.00	8.00
	Air	5.00	-	-	-	-	3.00		5.00	-
JUANJUI	Land	1.00	1.25	.75	.75	-	.75	-		1.50
	Water	-	-	.75		6.00	2.00	5.00		
	Air	-	-	-		-	4.00	5.00		
SAPOSOA	Land	2.50	2.75	2.00	2.00	-	2.00	-	1.50	
	Water	-	-	-	-	8.00	-	8.00	-	
	Air	6.00	-	-	-	-	-	-	-	

Source: Ministry of Transportation

* up to 8 ton single axel truck

** Raft or canoe

*** Light, single engine aircraft, except 4 engine prop. aircraft between Tarapoto, Bellavista and Juanjui

- Between the Project area and outside markets the rates are as follows in Soles/Kg.:

From	to	VIA Air	Land	River
Tarapoto	Yurimaguas	2.60	2.50	3.00*
Yurimaguas	Iquitos	3.00	N/A	.90
Tarapoto	Chiclayo	7.50	2.80	N/A
Juanjui	Lima	10.35	6.00	N/A
Tarapoto	Lima	10.35	5.90	N/A
Tarapoto	Iquitos	5.00	-	4.00***

* Source: Ministry of Transportation Estimates

** Includes land transportation to river point below rapids at Chazuta S/.1.00.

*** Includes transhipping costs at Yurimaguas S/. 0.10/Kg.

(ii) Project Response

The Project will not finance improvements of the major routes leading from the Project area to external markets nor will it finance major highway construction within the Project area. The Project is intended only to finance the improvement and extension of six secondary penetration roads and their physical linkage with the marginal highway to facilitate commerce. These were selected for construction or improvement on the basis of the amount of arable land in each of the valleys in the Project area. The work will be done to the minimum specifications consistent with GOP policy and will be graveled or surfaced with selected material to give year-round service with proper maintenance. The Project provides for acquisition of maintenance equipment which will be operated by ETC on a regular servicing schedule.

Arable land is concentrated in river valleys which lack adequate roads or road linkages with the marginal highway. In order of size these are:

	Land Classifications (Hectares) I & II	III	TOTAL	Km Roads to be Improved	Constructed
The SISA Valley	18,290	14,750	33,040	34	35.5
The BIABO "	10,752	2,075	12,827		31.8
The PONAZA "	5,900	2,385	8,285		30
PUCACACA	2,544	1,860	4,414	10.3	
BUENOS AIRES	3,730	360	4,090	12.5	
SAPOSOA	9,830	-	9,830	19.6	
			72,486	76.4	97.3

There are other areas of highly fertile soils near Juanjui and Tarapoto which will not be afforded new roads because they are contiguous to existing roads or navigable rivers and have access to markets.

Road improvement within the Project area would have been wasted while the area remained isolated from the rest of Peru. Breaking the isolation, however, will have a chain reaction which will make internal road improvement economically feasible and indispensable to the development of the area. The first element of the chain reaction has already begun - the entry of new settlers, at a rate of 5-6 families a day, seeking land in the interstices of semi-populated areas. The second will be the entry of large numbers of transport trucks bringing merchandise heretofore brought by air, and seeking cargo for the return trip. The arrival of trucks from the coast will have two effects: it will lower the real cost of fuel, consumer goods and agricultural inputs and; it will relieve the pressure on agricultural storage facilities, permitting EPSA to buy larger quantities of grain with the assurance that it can be shipped to outside markets.

The entry of new settlers will gradually end the semi-nomadic practices of slash and burn agriculture, particularly on higher quality soils. Heretofore the luxury of abandoning cleared land was universal, one could always return to it in a few years. But with newcomers hungry for land, this will be a risky practice. Stable farms will result.

Without the road element, the benefits of these phenomena will be apparent only where there is easy access to markets, e.g., near the marginal highway. Here, competition will tend to keep freight rates within reasonable limits and the cost of inputs down to allow stabilized farming practices. Without the Project, this applies to only about 40% of the cultivable area of the zone, that which is contiguous to the marginal highway. With the Project, the benefits will accrue to the remainder of the zone.

(iii) Capital vs. Labor Intensive Methods (Food for Work)

The project area is characterized by a paradoxical labor shortage and substantial structural underemployment. This unusual juxtaposition stems from the variation between high labor requirements during peak seasons of planting and harvesting and low labor requirements during the growing season. During peak seasons family labor is fully employed while during the growing

season much of it is idle. Peak seasons coincide roughly with relatively dry periods while slack seasons occur times of heavy rainfall. Road construction would also tend to follow the same seasonality with more work possible in dry months and less during the wet months.

The composition of the labor force also influences the possible mix of capital vs. labor intensive methods of construction. About two thirds of the available labor is provided by women, youth and children. This type of labor is used for relatively light, if tedious, tasks on the farm and would not normally be available for heavier road construction work.

A third factor influencing the technology to be applied is the degree to which the project depends on roads for the effectiveness of its other elements. It has been determined that roads are critical to the success of all major project elements and so should be built as rapidly as possible.

Because of the three factors mentioned above, capital intensive methods of construction will predominate. Emphasis will be on developing and articulating the road network in the shortest possible time without undue dependence on the local supply of unskilled labor.

It follows, therefore, that Title II Food Donations will not be employed in this project. There are two additional reasons for this omission. First, it is likely that private contractors will be employed to perform a significant amount of the road work. Coordination of Food-for-Work activities between the contractor, the MTC, PVO's and local workers groups would be administratively cumbersome. Second, warehousing for food commodities will not be available until later in the Project when most road construction should have been completed.

(iv) Fixed Amount Reimbursement

The Mission has discussed internally and with the MTC the possible use of fixed amount reimbursement (FAR) methods for financing roads. Internally, the Mission concluded that FAR is not well suited to road construction of the type envisaged, primarily because of the wide variations in terrain and building conditions in the Project area and the detail that would be required to give exact quantities and costs for each kilometer of road in advance of construction. More importantly it is expected that the road construction will be completed by private contractors rather than directly by the MTC. This factor along with the projected austere budgets for 1979 and 1980 make FAR financing impractical since

an A.I.D. advance into a revolving fund will be needed to carry out the proposed construction.

(b) Land Tenure

Land tenure rationalization is a critical activity which must be accelerated to establish stable, commercially oriented farms which can take advantage of credit, mechanization and markets. The Mission has determined that the procedures used to assign usufruct rights (contracts of sale, certificates of possession) are optimal and that additional personnel and equipment along with new aerial photographs are needed to accelerate the pace of distribution. These are provided by the Project.

(c) Marketing

Farmers of the Project area have been highly sensitive to markets. EPSA's promise to buy corn at a favorable price in 1977 produced a crop of grain by mid-year which strained all storage facilities in the area and forced an emergency air transportation effort. A similar response is in the offing in soybeans, which EPSA is offering to buy in anticipation of the opening of the new highway. The development of grain storage and handling facilities will be divided into two phases. The first concentrates on expanding existing facilities for reception, handling and shipment of grain. In a second phase, storage facilities will be improved to accept greater volumes and to store grain for longer periods. As early in the Project as possible, loan funds will finance consulting services to help design new facilities and develop specifications for compatible equipment. The Project area will also benefit by the recent EPSA purchase of ten 1,000 MT and twenty 500 MT portable, inflatable storage units for use in jungle areas. Early in the Project, unforeseen storage needs will be met by these units which will be available in early 1978. Their purchase is independent of this Project.

(d) Farm Machinery

Farm machinery services under this Project are designed to break production bottlenecks, help stabilize tenure patterns, and expand the area cultivated or exploited for agricultural purposes. In the past there has been an overemphasis in the zone on

heavy machinery which could be used both for clearing heavy vegetation and for soil preparation. It was believed that bulldozers were safer and less susceptible to breakdowns. However, their operation is more expensive and less flexible than that of wheeled tractors.

Keeping in mind the services that are required - principally land clearing, soil preparation, and harvesting - equipment pool composition had to be mixed. Bulldozers are needed to condition land that is already partially cleared or in danger of being swallowed up by jungle regrowth called "purma" which starts when fields are abandoned. The basic operational concept is that bulldozers, equipped with rippers, rakes, brush cutters and rome plows will be used to prepare land for the subsequent use of lighter, more mobile wheeled tractors. They may also be used to recondition pastures by elementary brush cutting and weeding. These operations will take place after the original forest (which is really secondary or tertiary growth) has been cut, burned and planted several times, but before it is abandoned, as in the traditioanl system. Rakes will remove large logs, rippers will root out stumps and large rocks, brush cutters will remove light purma and rome plows will deep-plow to help maintain fertility. Following these operations, field conditions will permit the use of wheeled tractors on thousands of small farms. For this, however, some additional conditions have to be created, as follows:

(i) There must be adequate maintenance and repair facilities and field servicing capability. This implies a full complement of tools, spare parts and equipment for the machinery parks, as well as trained mechanics.

(ii) There must be trucks for transporting fuel, tractors, and spare tires; motorcycles for relief drivers and; radios for rapid communication.

(iii) Organized scheduling and programming of equipment utilization in coordination with farmers will be necessary.

(iv) A policy for providing services must be stated, to include the following:

-- Upper and lower limits on the amount of land that will be cleared or prepared for a single farm.

-- A lower limit on the amount of work to be done before tractors will be sent to an area. This means that farmers will have to be organized in groups to receive services and pay for them at the same time. Farmer nuclei can be used for this purpose.

-- Restrictions on the kinds of services that will be provided. In clearing land, preference will be given to final clearing of land that has been cut, burned and planted, then to removal of light rastrojo. Equipment should be used only for services which break production bottlenecks, i.e. plowing and harvesting but not planting or weeding.

-- Private individuals should be encouraged to provide additional machinery services.

-- Individual farm ownership of tractors and equipment should be encouraged; maintenance services for privately owned equipment should be provided at a fair price in the machinery parks.

A profitable SENAMA operation must be assured. Its profits must be reinvested in the Project area for new equipment, replacement equipment, spare parts, and additional services. In this regard the contribution to SENAMA from loan funds should be considered a contribution of the Government of Peru, and SENAMA should not have to repay the original investment. SENAMA should only be required to maintain availability and assure growth of services based on reinvested profits. All of the foregoing requirements are provided by the Project. 1/

This project element is divided into two phases: constructing and equipping machinery service centers to decentralize operations and make more efficient use of existing equipment
provision
of an initial equipment package consisting of bulldozers, wheeled tractors, machinery, and light, stationary treshers. Subsequent provision of additional equipment will be determined by the needs of the Project.

The first equipment package will double SENAMA's capacity in the zone. Sufficient land has already been cleared to permit full use of all wheeled tractors now available and those to be provided. Bulldozers will be used both to clear and to cultivate, according to the seasonal crop cycle and demand for services.

1/ This will be included as part of the Loan Agreement

(e) Extension

Extension services will expand on an annual basis, in concert with the growth of other services. The ability of the farmer to take advantage of extension services is influenced by credit, markets, and machinery, as well as the quality of the service itself. A sudden jump in the number of extension agents without improvement or expansion of other systems would mean wasting human and material resources, and a concommitant discrediting of the service itself. Each well-equipped agent should be able to service at least 200 farmers in large groups. By 1980 there will be 70 agents backed by 20 Agronomists to service between 11,000 and 15,000 farms, or an average of about 186 farms per extensionist.

4. Maintenance Capability

There are three Project elements which will require maintenance beyond the end of the Project: roads, farm machinery and collection centers. The Project is designed to build in the maintenance capability to sustain and expand the latter two through training and technical assistance during the life of the Project. Moreover, collection centers and farm machinery have an obvious economic basis for continued operation and maintenance because they will be providing services fundamental to production of priority commodities or will be operated on a profitable basis.

Road maintenance may be more problematic since, nationwide, Peru's capacity for this activity is limited in terms of budgets, personnel and equipment. The Project will, however, provide the basic equipment needed for optimum road maintenance during the life of the Project and for some years beyond. In addition, the Project is providing the capacity for maintenance of this equipment in SENAMA's machinery parks. Further, the equipment purchased will be assigned exclusively for use in the Project area, not to the nationwide equipment pool of MTC.

Limited equipment is assigned in order of priority, based primarily on traffic counts or on emergency needs. As traffic counts rise, the amount of maintenance effort follows suit. The roads of the Project area are expected to carry increasingly heavy traffic each year and hence, will merit intensified maintenance under current guidelines.

5. Environmental Considerations

An environmental assessment has been completed indicating that the project will have some negative as well as positive environmental impacts on the project area. It is the opinion of the Project Committee that an effective environmental resource protection plan is required to address the environmental issues raised in the EA, which are further defined

below. Therefore, the Mission will require the formulation and implementation of an environmental resource protection plan which is responsive to the environmental issues which were raised in the EA and in this paper. This plan, which must be acceptable to A.I.D. in form and content, should address natural resource conservation objectives by defining environmental constraints and opportunities, conflicts between environmental and economic goals, and programs and responsibilities for natural resource management. Appropriate resource protection criteria are to be developed as necessary and made a part of the plan. The Project's negative impacts are primarily associated with the construction of 174 kms of road, the clearing of land, and the settlement of an estimated 3,500 new families in the project area. The following is a summary of the reasonably foreseeable environmental impacts of concern which were identified during the project's environmental assessment process.

Soil erosion is considered a possible negative environmental impact although it is not identified in the Environmental Assessment developed for this Project. The Project Committee has taken several steps to assure that Project design will minimize this potential impact. The major impact of soil erosion will result from the land clearing element. Currently, approximately 43,000 hectares are under cultivation, mainly using destructive slash and burn techniques. It is expected that during the five-year project implementation cycle approximately 70,000 hectares will be cleared, of which an estimated 45,000 hectares will be cleared independently of the Project. The SENAMA land clearing operation will be aimed at clearing secondary and tertiary growth rather than virgin areas. SENAMA will develop as a condition precedent specific eligibility criteria for land clearing. Discussions with SENAMA officials indicate that such criteria will specify maximum slope to be cleared, classes of soil to be cleared (for example Class I, II, and III for crops and up to Class IV for land to be maintained in permanent pasture) and soil drainage characteristics.

A technical assistance package has been designed to develop SENAMA's and the extension service's capability to assist farmers with technologies aimed at limiting soil erosion (i.e., contour plowing, contour planting, and measures to incorporate crop residues into the soils to maintain soil organic matter levels). The extension service will have seventy (70) agents in the Project area working directly with the Project area farmers.

GOP and COPERHOLTA agronomists working in the area believe that, by mechanically clearing land and using proper soil conservation technologies as provided for in the Project, the effect on soil will be positive as compared to current practices of slash and burn clearance and seasonal stubble firing. The Project committee recognizes that the area will continue to contribute to water turbidity through increased silt and nutrient loadings. The safeguards incorporated into Project design for land clearing are intended to be in line with best soil conservation practices and will minimize soil loss, erosion and siltation. On the whole, the Project will provide the technical assistance which could reduce soil erosion to levels below those currently experienced.

The EA identifies air pollution from the open burning of saw-mill and agricultural wastes to be a significant potential problem. However, there appears to be substantial doubt as to the validity of such a concern. Agricultural extension programs aimed at training Project area farmers in the use of waste for soil building are expected to result in a reduction or elimination of the current practice of burning field wastes prior to seasonal planting. Given an extremely low background level of air pollution and an analysis of USAID Air Pollution Guidelines and their applicability, it appears unlikely that Project area ambient air quality will be adversely affected by the Project. The possibility exists that air quality may, in fact, be improved relative to seasonal episodes of fugitive particulate matter emissions from field burnings. Further discussions on the significance of emissions from saw mill waste combustion will be held with appropriate GOP officials to reach agreement on a program of control should such a program be required.

The Project will provide for the clearance of vegetation from approximately 20,000 hectares to be used as permanent pasture. In addition, approximately 100 km. of right of way will be cleared for construction of new single lane all-weather penetration roads. It is expected that clearance will mean a permanent transition from a generally secondary forest type of vegetative cover to agricultural use. This represents an estimated 2-3% decrease in the total Project area currently under virgin or regrowth forest cover. Loss of this vegetative cover will probably alter the existing ecological balance in and around the cleared areas. In addition to the destruction of habitats through clearance, ecological "niches" may be disturbed by the presence of human activities and settlements.

As a consequence, the Project may have a detrimental effect on the habitats of particular species of wildlife of interest of wildlife management specialists. There appears to be a possibility that four mammals currently on the U.S. Registry of Endangered Species, specifically the Giant Otter, the Amazonian Manatee, the Jaguar and the Ocelot, may be found in the general area of the Project. There remains a degree of uncertainty as to whether these species may actually be found in this area or whether past predation and/or current human settlement has already forced these species from the area. Should these species be found in the Project area, special provisions will be included in the environment protection plan required as a condition precedent to assure that appropriate measures are taken to preserve their habitats and provide for species protection. The GOP has shown a great deal of interest in the area of rare and endangered wildlife flora and fauna and will therefore be a willing and helpful partner in planning for the conservation of these species. Existing practices of land use and development are indiscriminately destructive to wildlife and their habitats. The proposed Project will provide for a systematic means of habitat protection with the potential for long term, effective management of critical habitats.

The loss of vegetation along riverbanks and its effect on erosion and wildlife habitats is discussed in the EA. A linear "environmental quality corridor" composed of a minimum of 20 meters of undisturbed vegetative cover will be assured by SENAMA as part of its land clearing criteria. There appears to be some question as to the efficacy of such a zone for the protection of the river bank and the terrestrial/aquatic ecozone given that the river banks has been a primary focus of settlement over the last 100 years. Further study in cooperation with the appropriate agencies of the GOP, will be undertaken to assure that a river bank conservation zone which is considered by A.I.D. to be adequate for purposes of erosion control and wildlife habitat preservation is defined and established.

The project committee has weighed these expected negative impacts against the positive results expected from the project. The total area of good arable (Class I, II, and III) land in the Project area totals 119,000 hectares, which represents approximately 7% of all good land in Peru. Over the years it is expected that all of this land will be brought into intensive production, supplying critically short food commodities to Peru's urban centers.

Further, though new colonization is expected, the project is essentially consolidating earlier spontaneous colonization in the area. At this time 11,500 families already live in the project area. The additional 3,500 which are expected to settle in the area over the next five years represent a 6 percent annual population increase for the project area. Given the general expansion of infrastructure and services, existing and projected, there should be few major problems in maintaining above average Peruvian living standards.

Road construction is planned primarily for valleys which are tributary to the Huallaga River. These penetration roads will be connected to the coast through Tarapoto by the jungle marginal highway. The tributary valleys are spaced out over a considerable area allowing for extensive natural greenbelts between the river valleys. These areas contain soils not suitable to agriculture, but rather are best suited for forestry. The project makes no attempt to develop these areas, nor is any development of these areas expected in the future. The greenbelt areas as compared to land which will be cleared can be expressed in terms of a ratio which is probably of the magnitude of 10 to 1.

The penetration roads to be constructed (98 kms) will be single lane - all weather roads. They have been designed so as to not alter existing drainage patterns. The remaining construction will be on 76 kms of roads which already exist but are not all-weather. These will be upgraded to all-weather standards using the same design criteria as the new penetration roads.

A careful examination of the environmental impact of the project, both the positive and the negative aspects, results in the conclusion that the positive effects of rationale land use planning outweigh the negative environmental impact. Project design has taken into consideration the negative impacts of project activities and incorporates measures intended to minimize them. It is the Project Committee's conclusion that the positive effects of the project are more than sufficient compensation for the negative impacts anticipated. Available measures to mitigate negative environmental effects of Project activities will be identified and implemented pursuant to the environmental resource protection plan to be prepared by the GOP for the Mission's review and approved.

B. Economic and Financial Analysis

1. Financial Plan

Table (III B) 1 shows total project invesment by source and allocation. Project funds (GOP plus A.I.D.) on a percentage basis are allocated as follows:

	%
1. Penetration Roads	29.4
2. Road Maintenance	5.6
3. Medium-Term Credit	18.5
4. Machinery Parks	14.6
5. Marketing & Collection Centers	3.3
6. Land Surveying & Titling	3.2
7. Extension Service	4.5
8. Resource Studies	.5
9. Project Direction	1.9
10. Technical Assistance	6.2
11. Inflation Factor and Contingencies	12.3
Total	100.0

Infrastructure development is clearly the single most important activity accounting for more than 50 per cent of total Project expenditures. Production credit needs will be met from existing Agrarian Bank sources. A covenant to the Loan Agreement will insure that such funds are available on a timely basis.

Table (III B) 1 further shows that A.I.D. will invest US $19 million (75%) and the GOP will provide a counterpart contribution of US $6.5 million (25%). During earlier stages of Project design it had been anticipated that the GOP counterpart contribution would be on the order of US $12 million. However, during the intensive review it became increasingly obvious that the GOP would not be able to meet the originally contemplated heavy investment due to a serious economic situation.

Table (III B) 2 shows the estimated annual Project investment to be made. The first Project year, after the initial conditions precedent have been met, is expected to be 1979. During the first year a relatively small amount (US $838,000) of funds will be needed. The A.I.D. portion of these funds will be spent primarily on technical assistance and engineering designs needed for the infrastructure build-up. GOP contributions have been kept to a minimum during the first year due to the projected austere national budget. The GOP contribution during the first year is primarily aimed at staffing offices which will manage the various Project components and to the development of engineering designs for infrastructure investments.

TABLE (III B) 1

SUB-TROPICAL LANDS DEVELOPMENT

Summary Cost Estimate and Financial Plan
(Thousands of U.S. Dollars)

	SOURCES			
	A.I.D.		PERU	TOTAL
	FX	LC	LC	
1. Penetration Roads (Design, Construction & Supervision		7132	373	7505
2. Road Maintenance (Equipment, Materials & Personnel	1050	120	246	1416
3. Medium-Term Credit (Fund, Equipment & Materials)	230	3000	1500	4730
4. Machinery Parks (Construction, Equipment & Personnel)	3000	100	625	3725
5. Marketing & Collection Centers (Construction, Equipment & Personnel)	430	30	380	840
6. Land Surveying & Titling (Equipment, Materials & Personnel)	140	30	650	820
7. Extension Service (Equipment, Materials & Personnel)	390	8	750	1148
8. Resources Studies (Equipment & Materials)	100		20	120
9. Project Direction (Equipment, Materials & Evaluation & Personnel)	20	90	380	490
10. Technical Assistance:				
- For Machinery Parks	660		30	690
- For Marketing & Collection Centers	300		50	350
- For Land Surveying & Titling	-		150	150
- For Resources Study	200	30	150	380
Sub-Total	6520	10540	5304	22364
Plus: Inflation Factor and Contingencies	974	966	1196	3136
	7494	11506	6500	25500
	(19,000)			
	(74.5%)		(25.5%)	(100%)

TABLE (III B) 2

SUB-TROPICAL LANDS DEVELOPMENT

Annual A.I.D. and GOP Disbursements for Project Implementation 1/
(Thousands of U.S. Dollars)

	I	II	III	IV	V	Total A.I.D./GOP
1. Penetration Roads						
(Design, Construction & Supervision)	320	3250	3740	888	75	8273
A.I.D.	(320)	(3250)	(3410)	(800)	-	(7780)
GOP	-	-	(330)	(88)	(75)	(493)
2. Road Maintenance						
(Equipment, Materials & Personnel)	-	600	794	100	130	1624
A.I.D.	-	(600)	(744)	-	-	(1344)
GOP	-	-	(50)	100	(130)	(280)
3. Medium-Term Credit						
(Fund, Equipment & Materials)	-	850	1450	2340	770	5410
A.I.D.	-	(700)	(1050)	(1280)	(500)	(3530)
GOP	-	(150)	(400)	(1060)	(270)	(1880)
4. Machinery Parks						
(Construction, Equipment & Personnel)	100	1600	1050	1206	314	4270
A.I.D.	(100)	(1412)	(800)	(1000)	(248)	(3560)
GOP	-	(188)	(250)	(206)	(66)	(710)
5. Marketing & Collection Centers						
(Construction, Equipment & Personnel)	50	200	270	368	124	1012
A.I.D.	(50)	(100)	(150)	(238)	-	(538)
GOP	-	(100)	(120)	(130)	(124)	(474)
6. Land Surveying & Titling						
(Equipment, Materials & Personnel)	40	220	309	300	139	1008
A.I.D.	(30)	(100)	(59)	-	-	(189)
GOP	(10)	(120)	(250)	(300)	(139)	(819)
7. Extension Service						
(Equipment, Materials & Personnel	90	220	400	376	260	1346
A.I.D.	(40)	(100)	(200)	(116)	-	(456)
GOP	(50)	(120)	(200)	(260)	(260)	(890)
8. Resources Study						
(Equipment & Materials)	30	80	29	-	-	139
A.I.D.	(10)	(80)	(29)	-	-	(119)
GOP	(20)	-	-	-	-	(20)
9. Project Direction						
(Equipment, Materials Evaluation & Personnel)	120	120	120	100	134	594
A.I.D.	(78)	(20)	(20)	-	-	(118)
GOP	(42)	(100)	(100)	(100)	(134)	(476)
10. Technical Assistance	88	500	520	530	186	1824
A.I.D.	(30)	(400)	(420)	(430)	(86)	(1366)
GOP	(58)	(100)	(100)	(100)	(100)	(458)
Total	838	7640	8682	6208	2132	25500
Total A.I.D.	(658)	(6762)	(6882)	(3864)	(834)	19,000
Total GOP	(180)	(878)	(1800)	(2344)	(1298)	(6500)

1/ The reserves for inflation and contingencies have been factored in each investment category.

The heaviest years of A.I.D. contributions are the second, third, and fourth years. It is during this period that the majority of the Project's infrastructure will be developed including penetration roads, machinery parks, and marketing centers. As the infrastructure components are developed complementary activities (extension, road maintenance, Project direction and land surveying and titling) also expand rapidly.

The financial plan as presented holds GOP contributions to a minimum during 1979 and 1980. Current projections anticipate an improvement in the Peruvian economy by 1981. During 1981 and 1982 the GOP contribution reaches its peak. Most of the counterpart contribution is to be used to finance continuing services to the Project area, both during and after the disbursement period, such as credit, Project direction, extension services, land surveying and titling and road maintenance.

Table (III B) 3 provides a detailed breakdown of the technical assistance component. The A.I.D. portion ($1,366,000) is to fund approximately 20 man years of long-term loan funded technical assistance. It is anticipated that most of these funds will be used to cover foreign exchange costs of the technicians. The GOP portion of US $458,000 is for contracting of engineering services.

2. Recurrent Budget Analysis of Implementing Agencies

a. General

Budgeting within GOP Ministries begins within the functional Directorates and zonal offices and is based on activities and targets to be achieved in the course of a year. Budget requests are examined by the planning offices of each Ministry at the national level and are brought into line with overall availabilities established primarily by the Ministry of Economy and Finance. Then, at the operating level, adjustments are made in activity targets in accordance with actual availabilities. Most of this work is accomplished in the last half of each calendar year and an overall budget is published in January, for the following 12-month period. Once established, the budget of each Ministry is reasonably predictable though adjustments may be made to allow shifts of funds from less active to more active programs. Quarterly analyses are performed to evaluate achievements against expenditures.

TABLE (III B) 3

SUB-TROPICAL LANDS DEVELOPMENT

Technical Assistance Component 1/
(Thousands of U.S. Dollars)

Application	SOURCES A.I.D.	GOP	Total
1. Machinery Parks			
1.1 Management Advisor (3 man-years)	180		180
1.2 Maintenance Specialist (3 man-years)	150		150
1.3 Agricultural Engineer (2 man-years)	105		105
1.4 Specialist on Soil Conservation (2.5 man-years)	125		125
1.5 Engineering services		30	30
Sub-total (1)	560	30	590
2. Marketing & Collection Centers			
2.1 Agricultural Engineer, Specialist in Handling & Storage Facilities (1 man-year)	60		60
2.2 Maintenance Specialist (2.5 man-years)	150		150
2.3 Engineering Services		50	50
Sub-total (2)	210	50	260
3. Resources Studies			
3.1 Specialist in Evaluation and Inventory of Resources (3 man-years)	230		230
3.2 Professional Services		150	150
Sub-total (3)	230	150	380
4. Land Surveying & Titling			
4.1 Aerial Photographic Services & Maps		150	150
Sub-total (4)		150	150
5. Project Direction			
5.1 Management Specialist (3.5 man-years)	190		190
Total (1) to (4)	1190	380	1570
Plus: Inflation & Contingencies	176	78	254
Grand Total	1366	458	1824

1/ GOP portion is either for engineering design services or personnel.

Under the existing conditions of austerity and inflation, Ministerial budgets are often inadequate. Near year's end, for example, funds allocated for travel expenses are often exhausted, even though allowances are kept below actual costs. In addition, funds for new or replacement equipment are extremely scarce and limitations on contracting and hiring personnel have hampered achievement of planned targets. Such restrictions produce inadequate provision for contingency costs or unforeseen expenses. Thus, operating units often lack the ability to respond to emergency needs and are somewhat inflexible as to the activities that can be undertaken. Austerity is likely to be in force for some time to come, with some relief possible by 1980. For these reasons, USAID has structured the Project to minimize counterpart requirements in the first two Project years.

b. MINFOOD

In 1977 MINFOOD has an annual budget of S/.5,763 million ($72.0 million - US $1.00 = S/.80.00) of which S/.825,100,000 ($10.3 million) is earmarked for investments. These levels are consistent with past years and represent a reliable basis for future projections. Each Food Zone and Research Center is allocated a share of the MINFOOD budget based on requests from the zones and centers which are tied to activities projected for the year. A summary of the 1975-76 and 1977 budgets for Food Zone IX appears below:

Table — Food Zone IX Budget (000 Soles)

Purpose	Biennial 1975-76	1977
Salaries	68,140	73,572
Materials	9,588	13,349
Services	70,316	16,931
Transfers	8,877	5,388
Capital Goods	12,430	3,800
TOTAL:	169,351	113,041
	(US $3,387,000)	(US $1,413,000)
	US $1.00 = S/.50	US $1.00 = S/.80

Start up costs for training, equiping and operating the extension service during the Project (additional expenses) are projected as follows:

SOLES (000)				
1979	1980	1981	1982	TOTAL
4,000	7,750	10,750	12,500	35,000

(US $430,000)

Beyond the life of the Project, the annual level of expenditures will remain constant.

Additional expenditures caused by the Project in any given year will not exceed seven per cent of the present budget. Because the Project area represents about ten per cent of the crop production capacity of the country, and because extension is the principal function of the Food Zone, it is expected that MINFOOD will be able to justify and absorb this additional cost.

Machinery and marketing functions are planned so as to avoid placing demands on GOP budgetary resources beyond the original investment. This leaves one major Project element which will require continuous outlays -- road maintenance. During the life of the Project, additional maintenance costs are projected at a maximum of $262,000 per year for 174 Km. of additional roads.

c. Ministry of Transportation

The policy of the Ministry of Transportation has been, of necessity, to allocate maintenance funds to roads according to the traffic they bear. The Department of San Martin has been isolated during its entire history. As a result, any vehicles that entered the Department arrived by air shipment. Their number is small; hence the traffic is light and roads are little used. It was understandable that little attention was paid to road maintenance in the zone. Essentially, only emergency maintenance jobs were undertaken.

With the opening of the Tarapoto-Rio Nieva highway and the improvement of the internal road network, traffic counts on all roads are expected to increase steadily. Truckers will begin to penetrate the area to deliver and pick up goods and there will be a need and a justification for greater maintenance outlays. Under the terms of the A.I.D. Loan for the construction of the Tarapoto highway, the GOP is committed to the maintenance of the main truck road between Rio Nieva and Tarapoto. Some of $3.0 million in construction equipment for this loan Project is scheduled to arrive late in 1977. This equipment will be used to finish the highway

construction and will be available for maintenance work. Thus, part of the maintenance needs of the zone can be met from existing resources. Given the productive potential of the zone and the expected use of, and dependence on, roads to extract economically important agricultural commodities, the remaining funds to maintain the roads should be readily available. The conomic advantages of roads are made obvious by the recent airlift of corn by C-130 aircraft from Tarapoto to Trujillo and Yurimaguas. Some 2,300 tons of corn were shipped over a 30-day period at an undisclosed but very high cost. At commercial rates the cost would be in the neighborhood of $287,000, enough to maintain all Project roads for a year. Airlifts of petroleum products involving heavy subsidies have also been necessary.

The judgment of the USAID is that an increased effort in road maintenance will be undertaken by the GOP. This effort, however, must be evaluated in the light of the difficulty of the task in the climate of zone and an anticipated nationwide scarcity of financial resources. It must also be noted that any maintenance outlays depend on actual road utilization, i.e. on the economic importance of various highways as measured by traffic counts. Therefore, if the Project succeeds in creating an area of high productivity, maintenance financing will increase to optimum levels. Further discussion relating to budget and management capacity has been developed and is presented in Part III 1, by individual Ministry and Agency.

3. Farm Budget Economic Analysis

The Project was analyzed for its impact on both the financial status of its beneficiaries as well as the economy as a whole using the AID/W Small Farm Budget Computer Program. Three basic tests -- one economic and two financial -- were used to analyze the economic desirability of the Project. The following is a description of the decision criteria used in the analysis of the project, the cash-flow procedures specific to the Project analysis, and the sequence of tests used in establishing the economic and financial viability of the Project.

a) <u>With and Without Approach</u>

Financial and economic tests specify the incremental increases in costs and benefits associated with Project implementation compared to the situation if the Project were not to be undertaken. Without the Project it was assumed that gradual growth in farming activities would occur at low levels of investment. It was further assumed that marginal shifts in production patterns and crop mixes would occur in response to markets now operating in the Project area. With the Project a gradual, but more rapid, increase in

agricultural activity was assumed. Expansion of land under cultivation, double cropping, mechanization, reduced crop losses, more pronounced shifts toward high return cash crops (with higher farm gate prices) were assumed to accelerate rapidly beginning in the third and fourth year of the Project and to continue through the Project life until nearly all land would be fully and continuously utilized.

For the farm level analysis, two prototype cases were studied and computations were made to reflect the "without" and "with" Project situation. The prototypes analyzed were: (a) a crop farm and (b) a livestock operation. In the "with" Project case, the incremental cash flow was discounted to arrive at a financial rate of return. Shadow prices for labor were then applied to arrive at the economic rate of return.

b) Model Assumptions

i. Project Life

A Project life of 13 years was assumed to reflect the relatively short economic life of Project inputs such as machinery, grain storage and handling equipment. This is conservative since with proper maintenance the life of roads is much longer.

ii. Working Capital

It was assumed that farmers would require and utilize working capital for seed, fertilizer, veterinary supplies, pesticides, traction, and fencing. An interest rate of 16% was assumed. 1/

iii. Rate of Development

To achieve nearly full and continuous land utilization a period of 10 years was allowed with the Project. This was based on the traditional, subsistence nature of agricultural practices developed for survival in an isolated area and on the physical limitations which must be overcome to develop fully the land resources of that area once it is linked with wider markets.

iv. Costs and Prices

For the economic and financial rate of return constant prices as of July 1977 (80 soles = 1 US dollar) were used on the assumption that long-term trends would leave future prices in roughly the same relationship. The effect of inflation on prices of goods and services to be procured under the Project is thus subsumed under the cost estimates themselves. However, hired labor was ascribed its legal wage beginning in the seventh year of the project when demand for it equaled 50% of available family labor.

1/ An interest rate of 16% was used throughout, for both production credit and intermediate credit. Since the GOP has announced its intentions of raising interest rates over the next year, in order to reach positive rates, sensitivity analysis was performed using a 25% rate, and both projects still met financial and economic rate of return criteria.

v.) Shadow Prices

Daily wages for unskilled labor in the Project area are S/.70.00, substantially lower than the official wage rate of S/.140.00. However, most non family labor is performed on an exchange basis without monetary compensation. On-farm family labor was therefore shadow-priced at 50% of the going wage rate because of its composition which includes children and youth. Non-farm labor would command the full official price.

With exchange rates being adjusted upward periodically a reasonable value for local currency has been established. This eliminates the need for a premium on foreign exchange.

vi.) Sensitivity Analysis

Sensitivity calculations were performed to evaluate the effects of:

-- An increase of 15% in costs of production, combined with a 15% drop in yields.

-- Land reduced by 25% and yields reduced by 15%.

-- Land reduced by 25% alone

-- Interest rate increased to 25%.

c) Data Sources and Data

Data on yields, costs of production and existing crop patterns were derived from a series of reports and studies prepared in early 1977 by various entities in the Project area. As a basis for determining the composition of a typical farm, three farm case studies performed by COPERHOLTA 1/ were used. Their areas, labor supplies and cropping patterns were combined into one unit of 30 hectares with a labor supply equivalent to that of three families. Project costs equivalent to approximately $15 million 2/ were attributed to the farm after dividing them equally into 50,000 hectares which represents 50% of the class I, II, and III land in the Project area.

1/ Villanueva Carbajal, Lincoln and Th.De Uries, David "Proyecto de Desarrollo Agropecuario Del Huallaga Central Bajo Mayo (Departmento de San Martin)" Proyecto COPERHOLTA, 1977.

2/ Double counting would result if the total project cost were factored in. Therefore, the figure charged per hectare in the farm budget analysis is net of the medium-term credit and machinery parks.

Costs of production for traditional and nontraditional practices were derived from a feasibility study for a Project similar to the one proposed here. This study was performed by COPERHOLTA in February 1977, and was adjusted by data from a Rural Settlement Plan formulated by the Ministry of Agriculture at about the same time. COPERHOLTA farm case studies were used to round out and cross-check the data.

d) Analytical Results (Calculations are presented in Annex II Exhibit 3)

The small farm budget data was used to calculate three indicators whose values convey the economic and financial viability of the project. The logic of the sequence of indicators is as follows. The economic rate of return indicates whether the project is in the national interest. A rate of return above 15% satisfactorily meets this test, while a rate below 15% suggests that the project is an inefficient use of the country's investment and other resources.

Once the economic rate of return had been determined two financial rates of return where calculated to indicate the impact on the individual farmer costs. The two financial tests carried out for the project measure:

i.) The rate of return to the farm unit for labor management, and investment (labelled "on-farm net benefit") where family labor is valued at the market rate and;

ii.) An end of year cash balance where family labor is netted out.

Net on-farm benefit is calculated to determine whether the project is sufficiently attractive to the individual farmer to ensure his participation. Specific rates of return that will assure farmer participation are conjectural. However, rates over 30% are intuitively attractive. Returns to labor and management are calculated in order to determine whether the farm unit will generate sufficient cash flow to repay amortization costs.

The results of the analysis are contained in Tables (IIIB)4 and (IIIB)5. These tables include the with project results including the sensitivity analysis. Results are presented for both Crop and Livestock; no analysis was attempted for a mixed crop and livestock farm.

Table (III B)4

PERU SUB-TROPICAL LANDS WITH PROJECT (CROPS)
RATE OF RETURN ANALYSIS

	On Farm Net Benefit	End of Year Cash Balance	Net Economic Cash Flow
1. Without sensitivity analysis	>50%	>50%	34.09%
2. Production reduced 15% and costs increased 15%	35.44%	>50%	14.50%
3. Land reduced 25% and production decreased 15%	>50%	>50%	14.38%
4. Land reduced 25%	>50%	>50%	24.07%
5. Interest rate increased to 25% (both production and intermediate credit)	38.93%	>50%	29.15%

Table (III B)5

PERU SUB-TROPICAL LANDS WITH PROJECT (LIVESTOCK)
RATE OF RETURN ANALYSIS

	On Farm Net Benefit	End of Year Cash Balance	Net Economic Cash Flow
1. Without sensitivity analysis	>50%	>50%	40.74%
2. Production reduced 15% and costs increased 15%	17.03%	>50%	20.88%
3. Land reduced 25% and production decreased 15%	18.25%	>50%	17.07%
4. Land reduced 25%	25.73%	>50%	26.68%
5. Interest rate increased to 25% (both production and intermediate credit)	23.74	>50%	34.71%

e) Conclusions

Based on the foregoing analysis the Project is an efficient use of development resources. Both crop and livestock operations show substantial on-farm benefits and returns to the economy as a result of the projected investment. Additionally farm units will generate sufficient cash flows to allow them to amortize their individual loans. While these benefits could be reduced by higher costs or lower prices, they would remain positive. In fact, prices are expected to rise as a result of the project. Costs are expected to fall. In this sense the rise of current farm gate prices to estimate financial and economic benefits presents the most consecutive case.

4. Macro Economic Considerations

The far reaching socioeconomic reforms initiated during the Velasco regime have now stabilized under the government's consolidation program. These socioeconomic reforms have had high short-term costs in terms of agriculture and industrial production and have been a heavy budgetary burden. These coupled with the disappearance of the anchovy, major price declines of Peru's principal exports (sugar, and minerals, especially cooper) and a growing debt burden which has emphasized short-term borrowers, have resulted in the current economic crisis.

During 1977 the Peruvian GNP and GNP per capita (at current prices) are expected to grow at the rate of -9.7% and -12.4% respectively*.

The Sol during the months of October and November declined approximately 43%. Peru's net reserve position has gone from a positive balance of US $116 million at the end of 1975 to a projected negative balance of US $1.1 billion. (Additional balance of payments information is presented in Table (III B)6.)

Peru's response to this economic situation has been to sign a tough IMF stand by agreement (Nov. 18, 1977). The terms of the IMF agreement call for a floating exchange rate, tax increases, and a further cut-backs (the third this year) in the national government budget. In short, the GOP is undertaking a major economic stabilization program.

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* Since the Sol has declined markedly since these projects were made growth in dollar terms will be considerably worse than these figures indicate.

Peru: Balance of Payments, 1975-78

Table (III B)6

(In millions of U.S. dollars)

	1975	1976 First Semester	1976 Second Semester	1976 Total	Proj. 1977	Proj. 1978
Current account	-1,538	-696	-467	-1,163	-857	-483
Trade balance	-1,099	-483	-258	-741	-368	50
Exports, f.o.b.	(1,291)	(548)	(811)	(1,359)	(1,782)	(2,050)
Imports, f.o.b.	(-2,390)	(-1,031)	(-1,069)	(-2,100)	(-2,150)	(-2,000)
Services	-488	-236	-244	-480	-546	-588
Investment income	(-240)	(-159)	(-178)	(-337)	(-436)	(-513)
Other services	(-248)	(-77)	(-66)	(-143)	(-110)	(-75)
Transfers	49	23	35	58	57	55
Capital account	1,291	258	383	641	665	278
Private sector	342	96	100	196	69	120
Official loans	791	172	341	513	602	161
Disbursements	(1,068)	(300)	(497)	(797)	(993)	(800)
Amortization	(-277)	(-128)	(-156)	(-284)	(-391)	(-639)
Other public sector	158	-10	-58	-68	-6	-3
Basic balance	-247	-438	-84	-522	-192	-205
Short-term capital and errors and omissions	-319	-230	-115	-345	-143	55 1/
Surplus or deficit, net of balance of payments support loans	-566	-668	-199	-867	-335	-150
Memorandum						
Balance of payments support loans	--	--	165	165	222	-47 2/

Sources: Central Reserve Bank of Peru; and Fund staff estimates.

1/ Includes a US$65 million estimated net outflow due to reduction of minimum financing requirements for imports.

2/ Excludes disbursements on possible new balance of payments support loans.

The longer run economic outlook for Peru is not as bleak as the short run. Part of the huge deficit has been caused by major investments in the mining sector, the trans-andean oil pipeline and major coastal irrigation projects. These investments are just beginning to be productive with major improvements expected in the overall reserve and economic situation expected during the early 1980s.

The Sub-Tropical Lands Project will have important positive long-term impacts on the national economy. The Project, taking into consideration the current situation, is oriented exclusively toward agricultural production. Once the Project infrastructure is in place the area will become a major food supplier for the heavily propulated Peruvian coastal area. The impact will be significant at the national level as evidenced by the fact that the Project area contains approximately seven per cent of Peru's class I, II and III land. This increased production will have a strong substitution effect for currently imported agricultrual commodities.

A consequence of the current economic situation is a counterpart crisis (see Lima 9074 and State 259630). Every effort has been made during the intensive review to hold GOP counterpart to 25%. Further, during the early years of the Project GOP counterpart has been reduced to the maximum extent possible so as not to endanger Project success or cause lengthy delays during the implementation period.

C. SOCIAL ANALYSIS

1. The Target Group

The present population of the Project area is approximately 180,000 with 60% living in rural areas (outside of communities larger than 5,000) and 75% depending upon agriculture, forestry, hunting and fishing for its livelihood. The rural people are composed presently of about 11,200 families which constitute the principle target group of this Project and live in small communities or individual farms along the banks of the Huallaga river and its tributaries.

This target population is composed principally of descendents of early settlers who arrived in the area 150 years or more ago. A smaller sub-group of the population are more recent arrivals with less than 20 years in the area who still have roots in Cajamarca, Ancash, Huanuco and other sierra locations.

Mestizos are the dominant group, constituting about 25% of the population. They are involved in the professions and trade with a few still practicing agriculture on a somewhat larger scale than their neighbors. Most, however, live in the larger population centers.

Campesinos (peasants) constitute 65% of the population. Their major occupation is subsistence farming (with a growing market orientation) on farms averaging about five hectares. They tend to be more native to the zone (more indian) than the Mestizo group, though their only language is Spanish. Campesinos tend to be less educated than Mestizos.

Lamistas are the earliest settlers. A Quechua group settled in Inca times. They are now found scattered throughout the area, though their center is the town of Lamas. Though they are a distinct ethnic group with strong traditions they are increasingly being integrated into the regional economic and social life. Traditionally monolingual in Quechua, the Lamista is now beginning to use Spanish and to intermarry with other groups.

There are no tribes of jungle indians living in the Project area. Mestizos, campesinos and Lamistas are generally intermixed throughout the Project area in nuclear settlements of which Tarapoto, with its 30,000 inhabitants, is the largest. Most of the rest of the population are in linear settlements of from 1,000-10,000 inhabitants, and dispersed settlements, located away from major transportation routes, with up to 1,000 people each. There are 366 communities in all, 234 with less than 200 inhabitants; 80 with 200 to 500; 30 with 501 to 1,000; 21 with 1,001 to 5,000 and only one with more than 5,000 persons. The inhabitants of these communities account for 94% of the total population, showing a strong preference for community life and security.

This tendency is not reflected in the formation of strong farmer organizations. While farmers live close together for social reasons in small communities and share their labor at critical times on a one for one exchange basis, they guard their independence zealously and make individual decisions and investments. Cooperativism, as an economic mode, has encountered resistance and land distributed along cooperative lines has generally been farmed individually.

An informal survey of attitudes toward development in the Project area reveals distinct differences between beneficary groups, principally between the Mestizos on the one hand and the Campesinos and Lamistas on the other. Mestizos would prefer urban oriented development and large, independent farming enterprises. Their main concern is land access to the coast for commercial purposes. Campesinos, particularly the most market-oriented of them, seem to emphasize the need for feeder roads and guaranteed markets. However, at the subsistence level, Campesinos are somewhat indifferent, tending to believe that past development efforts have passed them by in favor of other groups and expecting little in the future.

a. Education

In comparison with Peru as a whole the Project area is comparatively well off in terms of literacy and educational facilities at the primary level. The population is 70% literate, compared with 61% for the country as a whole. This is attributed to the existence of a normal school in the Project area supplying teachers to some 523 primary schools scattered throughout the zone.

b. Health

There are two hospitals, nine medical posts and 68 sanitation posts scattered throughout the area. These are staffed by 34 doctors, 17 nurses and various other professionals along with 255 paramedics or medical technicians. Nevertheless, the reality of disease and sanitation problems surfaced in the social-anthropological study of this Project has led to a preliminary conclusion that additional efforts in the fields of health and environmental sanitation may be advisable. The USAID has made an initial provision through the ABS for a health and environmental sanitation OPG to a private voluntary organization which is now preparing a proposal for this purpose.

c. Migration

The population growth rate is 3.9 per cent annually with 2.3 per cent the result of natural growth in the area and the remaining 1.6% caused by in-migration. Tarapoto, the major population center is growing at a reported rate of 15 per cent each year and other centers in the Huallaga river valley are experiencing major growth as well. In consequence the USAID is investigating accommodation of this growth through housing investment guarantees and related market-town development projects. The need for viable urban centers to serve an expanding rural population has become more urgent as the rate of in-migration has accelerated.

The possibility of obtaining land contributes most to the influx of people to the Project area. Nevertheless, at the same time, some individuals, mostly the upwardly mobile Mestizos, are induced to emigrate from the zone to other, more culturally attractive parts of the country. Aspirations regarding higher education and cultural advantages are responsible for much of the emigration.

In the last four years news of the impending opening of the Tarapoto-Rio Nieva highway has attracted new settlers to Rioja just north of the Project area. Six new communities have been established and the more recent arrivals are beginning to filter to Tarapoto and Juanjui from the Northern sierra and coast. Many of the new settlers come first as migrant laborers or, having accumulated some capital as farm or city workers, come to find land and establish themselves. Typical campesino immigrants are farmers, literate, and between 25 and 30 years of age. They aspire to own land which can be bought or claimed. There are no major conflicts between old and new settlers. The latter have access to abandoned or unused land which has been widely regarded as a free good.

d. Income

Farm income is not wholy dependent on farm size in the Project area. It is, however, dependent on the amount of labor the farm family can dedicate to the land. With present technology the average farm family can handle no more than five hectares of crops or perhaps 30 hectares of pasture. Isolation, lack of markets and the labor-short situation have tended to keep farm sizes small and rural income low -- about one fourth of the national average or between $100 and $200 per capita.

c. Land Tenure

Except in rare cases ownership or legal possession of the land is the mode. Renting and sharecropping are avoided because they lead to tenure disputes with the tenant able to make a claim against the owner for title to the land.

A study of 1,000 representative farms in the land records office showed only two properties larger than 340 hectares and 30 with more than 100 hectares. Properties in the 10 - 30 hectare range were common. A study of tenure patterns in the lower Sisa valley showed 34 per cent of the 1,205 properties had less than five hectares. Another 53% ranged from five to thirty hectares. Only 25 properties were larger than 100 hectares. The National Agricultural Census of 1972 shows that the larger the farms in the Ceja de Selva, the smaller the percentage of land suitable for crops and livestock. Farms of more than 500 hectares typically have less than one per cent arable land and a high proportion of waste land or forest. There were 428 titled and 777 untitled properties but only 100 of the titled properties were being worked by the individual to whom the title was issued originally. The remaining 328 titles had changed hands, usually through oral agreement, showing the fluidity of land tenure in the zone. The constant shifting of families from one farm to another, abandoning and re-opening of agricultural land has created a confused tenure picture.

2. Project Impact

The impact of this Project on the tenure pattern remains unclear particularly regarding the number of new families that will be accommodated on farm land in the Project area. The confused situation will continue until the area is more densely populated and the value of land rises because of greater competition for it and because there will be a market for its produce. Under such conditions the practice of shifting agriculture will subside and the farming pattern will stabilize. Expert judgement and examination of cadastral registers, various documents and studies, aerial observation and field visits have led to the conclusion that approximately 3,000 - 5,000 new settlers can be absorbed. As a

result, some of the larger registered properties will be reduced in size but most farm boundaries will remain intact. Reduction of farm size will not work a hardship on the larger farmers since historically they have used only a small portion of their land. Moreover, their right to as much as 1,000 hectares (of pasture land) is protected if they are able to exploit it. Most of the new farms, however, will be established on abandoned land, since the larger titled units tend to contain a large percentage of waste land or forest.

A more important effect of the Project will be the increase in the number of hectares farmed by the families now established in the area. Farmers of the area now have more land than they are using. But, with markets, roads, credit and technical assistance, they will have the opportunity to expand the cultivated area. Some obstacles to this process are perceived in the traditional, independent attitude of the farmers and, to some extent, in their distrust of development programs. Some observers have also noted a preference for leisure among the present campesinos contrasting with a marked work orientation among newcomers. However, there have been notable responses to market opportunities in corn and tobacco which lead to the conclusion that leisure preference is at least partly attributable to the lack of opportunity for remunerative labor. All Project elements are aimed at providing such opportunities and rewarding productive effort in a wider range of commodities. The risks of farming are certainly no greater in this Project area than elsewhere in the tropics and they are less than those encountered in much of Peru. It is probable that, with part or all of the Project elements functioning, the farmers of the area will respond productively.

3. Role of Women

The information on which this section is based comes from conversations with two anthropologists who have studied the Bajo Mayo-Huallaga Central region (Prof. Teofilo Altamirano, of the Universidad Católica and José Rondón, employed by the Ministry of Agriculture in Tarapoto), and a sociology student (Marta Arellano), who recently did her thesis research on the role of women in Tarapoto. The information they provided was complemented by observations and questioning during field work in connection with the Social Soundness Analysis. In most respects, the various sources of information were in agreement and, overall, there emerged an image of the campesino woman in the Project area as heavily involved in agricultural production and traditional female tasks, more educated than her counterpart in other rural areas, and possessing a strong voice in decision-making within the family unit.

According to a study conducted recently in the adjacent Alto Mayo area, 1/ where adult men were assigned a daily agricultural work unit of "1", women over 18 years of age were assigned a value of 0.6. That is, a woman's contribution to the total amount of family agricultural labor is 60% that of the male head of household. This work is separate from, and in addition to, the contribution women make in domestic tasks. In addition to her work in the fields, particularly in sowing, harvesting, and processing agricultural products, the women prepares the mid-day meal in the field. In addition women carry excess produce to local markets within the region.

Despite the significant economic contribution women make to the family unit, conflicting assessments were made of the perceived value of women by two different observers. One, an anthropologist, claimed that women were abandoned and divorced by their men at a perilously high rate, resulting in a trend towards disintegration of the family unit. The female sociologist disagreed with this conclusion, saying that men in the area respected the value of the woman's contribution and had not yet been tainted by the urban machismo attitude. In her survey, women were more likely to say that they could get along without their husbands, than men without their wives. Legally, women can own land. If, however, a divorced or widowed woman has a male child over 18, he is more likely to be in charge of the family's fields.

A conversation with the resident anthropologist, who is closely involved with farmers in the area, is worth describing, for it exemplifies the constraints on the involvement of women in the Sub-Tropical Lands Project. The anthropologist stated that government employees from the various ministries working in the region were wary of promoting the participation of women in agricultural development in the zone. One government official was threatened physically by the men of a community that thought the employee had violated one of its women. His act of promoting the participation of a woman by offering a form of assistance implied to the community that he expected sexual favors in return.

1/ Portuguez, Jaime and Rondón, José. "Determinación de la Unidad Agrícola Familiar en la Región de Selva para la Zona del Alto Mayo". Ministry of Agriculture, Zone IX, Tarapoto, 1977.

The official stated definitevely that he would personally never attempt to secure land for a woman or try to get her to join a cooperative venture because it would ultimately lead to losing at least his job.

Whatever the arguments against this mentality, it is improbable that male agricultural extension workers will be able to work directly with women in the Project. There are some female extension workers, but they are minuscule in number. Moreover, it is unlikely that women will seek direct participation in the Project implementation process. However, given the prominence of women in the agricultural economy, they will be direct beneficiaries of the improvements in agricultural production and marketing. For example, the adoption of machinery by farmers may make the work contribution of young girls less essential than at present, so they may have a better likelihood of attaining a high level of education than at present. The system of penetration roads will greatly facilitate the task of transporting commodities to the local markets for sale, easing the woman's task.

Some suggestions have been made regarding the inclusion of women as participants in a Project complementary to the agricultural production activities planned under this Loan. These include chosing women to educate other women in the selection and preparation of nutritional foods. It has also been suggested that, to combat deficient environmental sanitation practices, women be employed to educate other women in the handling of drinking water, and disposal of wastes. These two functions could be performed by the same, locally hired women, and would reinforce improvement in living standards made possible by increased agricultural production. Such a project is currently being developed with a private, voluntary organization.

IV. IMPLEMENTATION ARRANGEMENTS

A. Recipient

1. Development Committee, Eastern Region

Until August, 1977, the Departments of Loreto and San Martin were served by a Regional Development Committee with headquarters in Iquitos. The Committee was advisory in nature, without its own budgetary resources. It was composed of the senior representatives of each Ministry of the central government having functions in the region. The Committee Head, usually a military officer, was appointed by the President and had an office in the National Planning Institute (INP) as his technical secretariat. Subcommittees for development with the same basic structure were present in each of the two Departments. In San Martin, the sub-committee was headquartered in Tarapoto under the leadership of the Prefect of the Department. Historically, the function of the sub-committee has been the preparation of integrated development plans for the region and the coordination of activities between ministries within the region.

Operating and investment budgets for the offices of Ministries operating in the zone were prepared without reference to the Development Committee and were submitted directly to Ministerial planning offices in Lima. They were then passed to INP where they were evaluated against the recommendations of the INP representative in the zone. The budgets were then submitted to the Ministry of Economy and Finance (MEF) for final approval. Approved budgetary resources were channeled back through the Ministries, thence to their zonal offices.

On August 17, 1977, as a first step toward region-alization of the development process long contemplated in Peru, a new administrative law was promulgated for the Department of Loreto, separating it from San Martin, which includes the project area. The basic changes to be implemented are (a) creation of an independent Development Committee; (b) creation of a separate budget for the Department, granting to the Committee authority for approval of all budgets at the zonal level for transmittal to the central offices of INP in Lima, then to MEF for final approval; (c) transmittal of funds by MEF directly back to the Committee for disbursal to the zonal offices of each Ministry.

Under the new law, ministerial zone directors will continue to be appointed by their Ministry in Lima, as will INP officials and the Head of the Development Committee; but they

will work directly under the Head of the Committee. Other employees will work directly for the region, rather than for the Central Ministry, except in the case of SENAMA and EPSA which are semi-autonomous entities with a corporate character and so do not depend on the Development Committee for operational financing. Nevertheless, as dependencies of the Ministry of Food, they would be responsive to the committee, especially since investment funds for their activities would be channeled through the Committee, and the Chief of the Committee has full authority with regard to personnel management.

The administrative arrangements outlined above are described in a decree law for Loreto which provides for further implementational actions including reassignment of property and appointment of personnel to create a working organization. A similar arrangement is being developed for San Martin. The establishment of the committee and the regional administrative arrangements is a condition precedent to the Loan. The Committee for San Martin will have principle responsibility for executing the Project and coordinating the activities of the various participating agencies.

At the time of PRP presentation, after consultation with INP and the MINFOOD, a different administrative setup was contemplated. It was believed that a special project should be developed under MINFOOD auspices, since MINFOOD would administer directly or through EPSA and SENAMA a major portion of the Project's activities. A special project arrangement would, under existing law, permit MINFOOD to transfer Project funds to other Ministries under interministerial agreements for implementation of specific Project elements. The concept was acceptable to the Mission in the absence of the intention to create a more cohesive regional authority in the near term. However, it was recognized that the special project concept has weaknesses, first among which are likely delays in developing interministerial agreements for execution of various project elements, the slowness with which one Ministry can be expected to transfer resources to another, and difficulties in coordinating project activities.

With the existence of the Committee for Loreto as a model and given the fact that the GOP plans to establish a similar Committee for San Martin, the Mission has concluded that the regional committee is the preferred approach to project administration, primarily because of its greater potential to respond to local needs. It also should provide simpler, faster budgetary flows and greater responsiveness of the various zonal offices to project needs. Loan funded technical assistance to the Committee funding 3.5 man-years of management assistance is included in the Project's overall technical assistance package.

i) Ministry of Food (MINFOOD)

-- General

In 1974 the former Ministry of Agriculture was divided into the Ministry of Agriculture (MINAG) and the Ministry of Food (MINFOOD). The former was assigned Agrarian Reform, Irrigation, Industrial Crops and Natural Resources. MINFOOD was charged with defining and executing the policy for food production and marketing. The MINFOOD is headed by the Minister and Director Superior; it has a consultative council, legal and planning offices, staff support and technical divisions. The Minister of Food is responsible for the functioning of decentralized public entities such as the Public Enterprise for Agricultural Services (EPSA) and the Agro-Industrial Research Institute (IIAI).

Nationwide, MINFOOD employs 7,200 persons in all categories, professional, clerical and support. Of the total, somewhat less than 2,000 were stationed in Lima. (EPSA/SENAMA and IIAI personnel are not included in these figures.)

-- The Food Zone

Outside of Lima, MINFOOD is organized into 13 Zonas Alimentarias (Food Zones), each with its Zonal Director who is responsible for all Ministry activities in the zone. Each zone is further broken down into agencies and offices which serve small geographical areas. In effect each Zone constitutes a small-scale ministry with the Zonal Director supervising directly all elements of research, extension, marketing and coordination with the AGBANK and other Ministries, including the Zonal Office of MINAG.

The Project area is located in Food and Agrarian Zones IX with Tarapoto as the center of operations. Food Zone IX has 343 employees, including 104 specialists (agronomists) and 148 midlevel agricultural technicians.

-- Extension

Zone IX is subdivided into 11 Production Agencies which are charged with direct extension and marketing services to farmers. In the Project area there are four such agencies (Tarapoto, Bellavista, Lamas and Juanjui) with 40 agronomists and technicians.

Agricultural colleges such as the one in Tingo Maria are turning out midlevel technicans who are finding employment within the Food Zone. Therefore an increasing proportion of these technicians were born and educated in the jungle areas. The total number of extension agents is expected to rise to 70 in the fifth year of the Project, with most of the increase being recruited from jungle areas, in order to provide a cadre of technicians used to the jungle and familiar with its agricultural problems.

Zone IX has found it difficult to implement the national production system which was to have formed groups of farmers who produce the same crop in the area. By law, extensionists were to be assigned by crop and were to organize producers of that crop into groups called nuclei which would, with the extension agents help, plan the crop, apply for production credit and participate in marketing and related activities. Each nucleus was to have a representative on a local council, which, in turn would be represented on regional and national councils. Though some producers nuclei have been formed, MINFOOD personnel in the zone are modifying the original plan out of necessity. There are not enough extension agents to provide one for each crop in each agency area. If there were enough agents, they would not now have sufficient mobility to serve all potential recipients. Moreover, with farms generally isolated and scattered, agents would tend to compete with each other to encourage their particular crop, rather than cooperate to produce a rational farm plan. Zone officials believe they can achieve a more rational use of resources by eliminating specialization both of extension agents and farmers nuclei and have asked for ratification of this course of action in their zone. Given the wide diversity of crops that are grown on a typical farm, this system makes eminent sense.

By dealing with groups of farmers and covering a wide variety of technical needs an extensionist can serve a vastly greater number of farms. The number of farms served by one extension agent is expected to increase from 50 to 170 during the life of the Project with increased mobility, improved roads and a firm plan of action. Continuous training of extension agents through the ongoing COPERHOLTA project should facilitate this improvement.

-- Research

Another function of the MINFOOD, research, is centered in CRIA (Regional Agricultural Research Center) III, "El Porvenir". The Center is well equipped for its present functions which include a wide range of research in crops and livestock. The center has over 300 hectares, some of which should be used to provide high quality seed. This loan contemplates financing a seed handling and storage facility to complement this potential.

-- Institutional Capability

Country-wide, particularly in the Project area, MINFOOD has operated under a series of handicaps. The first of these arose at its creation when the old Ministry of Agriculture was divided into the Ministries of Food and Agriculture. Much time was spent in allocating personnel, dividing budgets, and handling related administrative details. Then, in 1975 shortly after its formation, MINFOOD faced two large tasks which strained its resources -- decentralizing, and building a national production system. Decentralization involved transferring a large number of employees to the field and setting up zonal budgetary, accounting, and operational procedures, all time-consuming processes. Formation of the national production system involved internal reorganizations for the purpose of creating and staffing an extension service which had earlier been dispersed or diverted to the execution of the agrarian reform. That the foregoing were accomplished in the face of freezes on wages and hiring for new positions and other budget related problems attests to the vigor of the Ministry.

In the Project area, problems were compounded by distance and isolation as well as scarce financial resources. Extension agents remain hampered by lack of vehicles and other equipment with which to reach their clientele. There are periodic shortages of gasoline, the supply of spare parts is minimal, offices often lack electricity for operating machines and there is a shortage of adequate housing for technicians and their families. Most of these problems are related to the isolation of the area, now ending with the completion of the Tarapoto-Rio Nieva Highway. This highway permits the regular entry of goods, most importantly fuel and spare parts but also building materials and other necessary supplies. The Dutch financed COPERHOLTA project has helped, since 1972, to alleviate some of the more severe supply and transportation problems and to envigorate the extension system through the addition of technicians. In this way a cadre of Peruvian technicians has been created and is functioning in the area. The group is small and the number of farmers served is correspondingly reduced. However, the Project was concentrated to on-farm research and was not geared up for the broader extension effort. COPERHOLTA is expected to continue its technical assistance and to expand it to broader technician and farmer training possibly through a center financed by the Dutch government. This, coupled with the resources contemplated in this Project, should enable Zone IX to fulfill its principal function, extension, in an efficient way.

ii) EPSA (Peruvian Agricultural Services Enterprise)

As a semi-autonomous enterprise of MINFOOD, EPSA operates with its own capital resources to perform the primary task of marketing agricultural commodities. It does so with a view to maintaining incentive prices for producers of primary commodities, corn, rice, soybean, sorghum, wheat, barley, beef, poultry and others. At the same time, EPSA operates its own retail outlets and supplies a large number of affiliated independent stores in an effort to keep consumer prices within reason. To this end, EPSA also allocates imported foodstuffs, principally wheat and corn, but also beef and other commodities, as needed.

EPSA's annual operating budget is about S/.35 billion ($437.5 million) with only S/.3.0 billion supplied by the GOP. The remaining funds are proceeds from sales, amounting to approximately $375.0 million. Both public and private financial institutions provide loans for operating expenses and EPSA has shown a small average profit overall for the last three years. However, a loss is projected for 1977, primarily because of a reduced GOP contribution. Employees number 2,718 in 1977, down from 3,455 in 1976 as a result of reductions in the number of temporary personnel.

-- Marketing in the Project Area

Grain warehousing facilities in the Project area are minimal. Tarapoto has 3,300 MT of storage capacity (EPSA owned) and there are cotton and tobacco warehouses of 7,500 and 6,000 MT capacity, respectively. During 1977, a 3,500 MT grain facility is to be built in Tarapoto and a 2,500 MT storage facility for corn and rice is to be built north of the Project area on the highway to the coast. Grain cleaning and drying equipment are insufficient and most farmers are far from collection centers. Hauling grain long distances within the Project area is an expensive undertaking for farmers.

EPSA's response under these conditions has been to limit its commitments on the types and amounts of grain purchased in the zone. It has made every effort, however, to ship grain by whatever means available, in order to free up storage space for additional purchases. In addition, EPSA has rented storage space and has asked private citizens to store grain temporarily in their houses.

There are ample funds for grain purchases. However, given the additional storage rental costs, losses from weather damage and the high costs of air transportation, there is a considerable subsidy involved. To date, volumes have been small and losses are made up from profits in other areas.

As production increases, EPSA's primary problem will be maintaining a flow of grain to markets in the Amazon basin and on the coast as well as preventing spoilage. Flow problems will be reduced when the Tarapoto-Rio Nieve Highway is completed. The Project will provide cleaning and drying equipment as well as an expanded system of collection centers giving ready access to the majority of farmers. Under these conditions it is expected that EPSA will be fully able to operate profitably in the area, eliminating the subsidy.

-- Operations and Administration

EPSA will buy designated products at fixed prices from any farmer with a land title or certificate of possession. Payment is made by check which can be cashed at any bank. Using lists of AGBANK clients, EPSA determines whether the seller has any debt to the AGBANK. If he does, the check is made payable to both the seller and the AGBANK so that payment will be made as appropriate.

EPSA then moves the products from its warehouse as the market dictates, using contract truckers. This system has proven adequate where land routes are available. Since EPSA offers incentive prices and a differential for jungle production, farmers prefer it as a market even though payment is often slower than from private buyers because of the AGBANK's role.

In addition to its grain marketing functions, EPSA operates a 2,500 hectare ranch in the Project area. The ranch has 4,550 head of cattle, mainly Zebu, which provide breeding stock for farmers of the Zone. A cross between Zebu and Brown Swiss is offered as a dual purpose dairy and beef animal. Credit for livestock purchases is available under a World Bank loan. In 1976 the ranch sold 777 head of breeding stock and sent 56 head to slaughter for domestic consumption.

EPSA has just taken over the principal slaughter house in Tarapoto. The facility will be renovated, a refrigeration unit will be installed, and full use is to be made of by-products such as offal, bones and tripe. Boned beef and pork will be shipped by air to Iquitos and Lima.

iii) SENAMA (Machinery Services)

SENAMA began operations in 1970 with the receipt of farm machinery valued at $263,000 from the GOP. In reality, 90% of the machinery received at that time had passed its useful life. SENAMA received financing from COFIDE (Corporación Financiera de

Desarrollo) and equipment dealers on commercial terms to finance its first years of operation. With the exception of the original GOP transfer, SENAMA has financed its own activities, operating in the manner of a business enterprise but remaining a semi-autonomous agency of the Ministry of Food.

The purposes of the organization are: (a) to provide specialized agricultural equipment rental services the cost of which is not within the reach of individual farm enterprises; (b) incorporate new lands through deforestation and land improvement; (c) participate in small and medium irrigation projects; (d) perform river defense works; (e) support programs of agricultural production; and (f) plan, program and execute the acquisition and placement of agricultural equipment to accomplish its mission.

SENAMA is a direct dependency of EPSA, described above. At the national level, it consists of the Directorate of Agricultural Machinery and three subdirectorates: Operations, Technical and Administration. The entitites charged with providing actual services are the seven Regional Agricultural Machinery Offices, one of which is found in the Project area at Tarapoto.

SENAMA maintains a respectably low overhead in its Lima Office which employs only 18 of its 463 employees. The 18 Lima employees constitute the professional or clerical staff which controls all operations, handling logistics, payrolls, procurement and transfers of employees and equipment between areas of operation as well as architectural and engineering designs. The seven field offices have 59 professional and clerical personnel and 346 workers (tractor operators and mechanics).

SENAMA suffers from liquidity problems which it attributes largely to a lack of operating capital coupled with the need to accept delayed payments from state enterprises and associative enterprises which have acceptable credit ratings. Also, since its services are in great demand because of the inability of individual farm enterprises to acquire and maintain farm machinery, it cannot satisfy all needs for its services. In attempting to keep profits to a minimum, SENAMA appears to have failed to generate enough income to grow as rapidly as it should in order to meet demand, as the following tables demonstrate.

Table (IV) 1

Profit/Loss Summary, SENAMA, 1972-1976

(S/.000)

	1972	1973	1974	1975	1976
Income	38,700	93,000	101,600	134,000	171,000
Expenses	32,200	84,000	100,000	132,700	187,000
Net Profit (Loss)	2,500	9,000	1,600	1,300	(18,000)

Table (IV) 2

Hours of SENAMA Machinery Services 1972-1975

(000 Hours)

	1972	1973	1974	1975	1976 *
Crawler Tractors	84	152	178	190	155
Wheeled Farm Tractors	30	22	22	25	24
Stationary Threshers	1	4	5	6	5
Backhoes	-	-	1	2	1
Motor Graders	5	7	7	8	7
Total	120	185	215	231	192

* Preliminary

The sharp drop in services rendered in 1976 is attributed almost entirely to the drought that struck the Sierra late that year and deprived the coast of needed irrigation water. In some coastal zones half of the tractors were idled, leaving SENAMA with fixed overhead costs and reduced income. The result was a net loss, the first in the history of the organization.

In 1977 SENAMA plans to acquire 110 new tractors (to replace some of the 185 it now owns) and auxiliary equipment for which bids have already been solicited. In coordination with MINFOOD, new tractor pools will be placed in Ayacucho, Cajamarca and Puno.

SENAMA maintains a regional office in Tarapoto which has at its disposal 17 track type tractors and 10 wheeled tractors. With these, 39 employees provide land preparation services on 1,200 hectares of farm land. In addition, land clearance is progressing at a rate of 300-400 hectares a year. Land clearing services are currently being provided to AZUCAR SELVA, a state owned sugar plantation now being established in the Project area. Constraints on SENAMA operations in the zone are divided into the physical and the administrative.

Physically, the lack of access roads limits the area in which tractors can operate and the general poor quality of existing roads creates logistical problems. Auxiliary vehicles are in short supply to transport tractors, fuel and supplies and relief operators to areas of operation. As a result, much time is wasted in moving to and from widely dispersed fields or in waiting for the arrival of fuel or spare parts. Though operators may work long hours, multiple shifts are not employed. Therefore, a maximum of 12 hours of operation per tractor is all that can be expected under present conditions, whereas, by working in multiple shifts, night operations would be possible in well established areas and 18-20 tractor hours a day would be feasible. Such operations require vehicles for transportation of relief drivers, a field maintenance capability, fuel trailers, tractor-office radio communications and detailed programming for serving an optimum number of contiguous farms. Another physical limitation is the lack of tractor operators trained for jungle conditions. SENAMA now shifts operators between areas of operation to meet peak demands. Coastal operators, however, are unused to jungle conditions and hazards. Moreover, they are assigned only temporarily and have no ties to the area. It is therefore necessary to train local personnel as mechanics and operators in order to develop a work force attuned to, and willing to function under, jungle conditions.

The condition of the land on some farms presents an obstacle to efficient machinery operations. When secondary vegetative growth called "purma" is cut and burned, sharp stumps and roots are often left to impede the use of rubber wheeled tractors.

It is believed possible to deep plow such fields with crawler type tractors to eliminate this hazard and clear the way for wheeled farm tractors. A related limitation on efficient use of tractors is the small size of farms and fields. Even though farms may be close to one another, the tractor operator often wastes valuable machine time in moving from field to field around obstacles such as tree lines which demark boundries or streams, ditches and the like. Partial administrative solutions will be attempted to overcome these last two limitations. Farmers who have cut purma fields will be advised to invest in land clearing by caterpillar operations in order to qualify for land preparation services. To facilitate operations in small fields, farmers will be advised to provide ready access by eliminating barriers or providing means of crossing them.

Administratively, demand for SENAMA's services are limited by (a) lack of land titles and (b) the consequent lack of credit. A farmer without a title or certificate of possession for his land is unlikely to invest in improvements. By the same token, the AGBANK will not risk lending to farmers who cannot provide collateral. Without credit, the farmer cannot pay for machinery services. For these reasons the Project design includes accelerated regularization of land tenure in the Project area which will qualify farmers to receive AGBANK credit and stimulate them to invest in SENAMA services.

The machinery pools of the size contemplated by this agreement will represent about 30% of SENAMA's total operation. In effect, the Project will create a mini-SENAMA which will need its own, semi-independent planning, programming, operational and financial capability. Revenues generated within the Project area must accrue entirely to the regional office to assure continuation and growth of the service within the area. These assets must not be drawn off to benefit other areas. SENAMA officials believe that technical assistance will be required for an operation of the size contemplated. Such assistance will be provided under the loan to train operators and mechanics, design a programming model, design pools, maintenance facilities, spare parts supply systems, provide guidance on stream lining operations, and advise on financial and accounting systems to assure the financial health of the enterprise.

iv) Agrarian Bank (AGBANK)

The AGBANK has existed since 1931 under a series of names. With authorized capitalization of US $.231.0 million and paid in capital of US $.73.0 million as of June 30, 1976, it operates 108 offices from its headquarters in Lima. There are approximately 2,700 employees, countrywide, after expanding at about 6% a year to accommodate the expansion of lending to small farmers.

Decree Law 21117 of July 1975 is the basic enabling legislation for the AGBANK. In addition to changing the Bank's name the law outlined its organization and called for a six year process of decentralization which would grant branches and agencies autonomous functional and administrative powers. The central office in Lima gradually will take normative, support and control functions.

The AGBANK is controlled by a Board of Directors which includes two representatives from MINFOOD and two from MINAG. There are 18 Branches and 90 Agencies and Inspectorates. Under the decentralization plan all Branches and 34 Type "A" Agencies now keep their own accounting records. Branch administrators may approve loans of up to $46,000 to individuals and $77,000 to cooperatives.

Administrators of Type "A" Agencies may approve short-term loans of $9,200 and medium to long term loans of $4,600. Likewise, without reference to higher authority, administrators of Type "B" Agencies may approve loans of up to $2,300. Inspectorates may process and oversee loans but have no approval authority.

Agronomists make up 75% of the AGBANK's 455 professional staff, 79% of which is employed outside Lima. All field offices have at least one agronomist; all Agencies and Branches have a lawyer. In addition to the professional staff, the bank employs 162 technicians and 1,649 administrative personnel along with some 586 service personnel.

Other donor experience with the AGBANK indicates that the institution has been able to retain qualified career employees and expand the total number of personnel despite recent freezes on wages. Professional employees have career status and the Bank holds regular training courses to maintain and improve skills. Operational and administrative manuals consistent with decentralization, a new data processing system and an improved information system are being developed. The most significant indicators of the AGBANK's capacity to use and maintain additional funds in its portfolio is the fact that its total annual loans have increased in equivalent dollar amounts from $89.5 million in 1968 to $329.8 million in 1975, a compounded rate of 20% per annum. Despite stepped-up group lending, the number of loans granted per annum also increased 38% during the same period. Another significant indicator of the Bank's orientation and capability is that the value of loans to small farmers increased from 38% of the portfolio in 1968 to 82% in 1975 while 63% of all loans were less than $1,111.00 in value.

-- AGBANK Activity in the Project Area

AGBANK agencies in the Project area report to the Iquitos Branch. One Type "A" Agency is located in Tarapoto and

there is a Type "B" Agency in Bellavista, about 100 Km. to the south of Tarapoto along the main trunk road. In Roja, about 200 Km. to the north of Tarapoto is another Type "B" Agency which reports to Tarapoto but is not in the Project area.

In 1976 the Tarapoto Agency and its outlying dependencies made 3,124 loans for S/.196,900,000 (about $3.0 million in 1976). Of these loans only 44 were for medium or long-term purposes, accounting for $252,000 (8%) of the total loan portfolio. All but three of the 44 medium-long term loans were World Bank funded.

Despite the severe communications, transportation and marketing problems of the Project area the Tarapoto loan portfolio's delinquency rate is about average for the country. As of December 31, 1976 2.2% of the portfolio was delinquent 90 days or less and 1?% was delinquent more than 90 days.

The capacity of the Tarapoto Agency of the Bank to expand operations is reflected in its growth record from 1971 when it processed 185 loans for S/.11.8 million to 1976 when it made 3,124 loans for S/.196.9 million. Loan volume and value are expected to double again in 1977 to about 6,000 loans and S/.400.0 million (about $5.3 million). Of the total, 70% are placed in the Project area. This growth has been accomplished without significant increases in personnel. The present complement of 44 employees includes eight professionals and 35 clerical, accounting and service personnel. For the future, however, the bank has plans to expand its professional staff by an additional 34 inspectors and agronomists and 29 support personnel as it upgrades the Tarapoto Agency to the equivalent of Branch status and opens at least two new Agencies, one each in the Sisa and Biabo river valleys.

This Project will help to alleviate several of the Bank's operational problems. The difficulty of field operations caused by inaccessibility of farms will be reduced by improvement and expansion of the road network. Marketing problems, which affect farmers' ability to repay, will be eliminated in much of the zone. Land tenure problems will be resolved, thus qualifying more farmers for credit. In addition, the Project will provide vehicles and office equipment to facilitate loan processing, inspection and collection.

The AGBANK's orientation toward the needs of small farmers nationwide and its success in expanding its operations accordingly lead to the conclusion that its criteria and its capacity are adequate to insure that the target group will benefit from credits supplied under this loan, from the regular production loan portfolio of the bank, and from the longer term credits for livestock and farm improvement available through an IDB loan. The use of A.I.D. loan

funds for medium-term credit will be limited to purposes of land clearance and perhaps road spurs or tracks providing access to groups of farms. (These minimal tracks would be built by SENAMA at about $4,300 per kilometer.) Upper limits on the amount of land clearance to be performed per farmer benefitted per year will assure equitable distribution of benefits. The limit will, of course, have to be consistent with SENAMA's needs as a business enterprise and will not of itself exclude farms because of size, since a major purpose of the project is to bring more land into production. Moreover, the few large farms of the area typically contain a great percentage of land unsuitable for cultivation and so have a relatively small resource base and income.

v) Ministry of Agriculture (MINAG)

When the former MINAG's functions were divided between MINAG and the new MINFOOD, the former retained the functions of (a) agrarian reform, (b) industrial crop production, (c) expansion and conservation of agricultural and forest areas, (d) natural resources development use, and conservation and (e) formation and functioning of associative enterprises.

Agrarian Zone IX corresponds with Food Zone IX. Within the Project area, MINAG services four associative enterprises and regulates land tenure. In addition, it is responsible for planning irrigation and reforestation projects.

Agrarian Reform has not affected the Project area in the sense of the major confiscations and redistributions of land that have occurred on the coast and in the sierra. In the absence of funds for major investments in forestry and irrigation, however, land tenure is a major function of Agrarian Zone IX. This is particularly true because of the state of flux in land tenure which prevails in the semi-nomadic, slash and burn style of farming now practiced. While a farmer may have an established title for a specific plot in a given year, he may have abandoned the tract, leaving it fallow and, in effect, giving up his rights to anyone who choses to occupy it. This situation, multiplied many times, makes difficult the job of keeping track of land ownership.

Despite this major difficulty, nearly 10,000 farm units were delineated by MINAG in the Project area between 1969 and 1974. Five cadastral teams used photo maps dating from 1966 for this purpose.

As stated in the technical analysis, it is recognized that much of the cadaster is now out of date because of shifting cultivation, subdivisions and related factors. For this reason MINAG is reactivating the cadastral activity. Technically,

the cadastral procedure is soundly based on aerial photos and on-site consultation with affected farmers. A local register is maintained and feeds into the national registry. Experienced personnel are available in the zone and the MINAG is clearly capable of performing the title registration and issuance required for this Project. The Project provides for both the hardware and the software required to complete a new cadaster by the fifth year of the Project.

vi) Ministry of Transportation and Communications (MTC)

The Ministry of Transportation and Communications was established in 1968. Its responsibilities are (a) to direct, coordinate and supervise the implementation of transportation and communications plans and programs; (b) to promote activities in fields of transportation and communications, (c) to direct, coordinate, implement and supervise the construction, maintenance and use of transportation routes and related installations.

-- Organization and Functioning

The Executive Office of the Ministry consists of the offices of the Minister and of the Superior Director (Deputy Minister). In addition, there is an overall advisory committee on Transportation and Communications and several advisory offices. The MTC carries out its activities within the country through the Regional Bureaus of Chiclayo, Huaraz, Arequipa, Cuzco, Huancayo and Iquitos. In addition, several decentralized agencies are attached to the Ministry. The principal activities of the Ministry are carried out by four General Bureaus: (a) Civil Aeronautics; (b) Communications; (c) Water Transportation; and (d) Land Transportation. The latter will be responsible for the physical execution of the roads within the project.

-- Personnel

In Lima the MTC has a total of 2,348 regular employees plus 750 under contract. In the rest of the country there are 280 regular employees plus 850 under contract. The total labor force employed in MTC projects is estimated at 10,000 countrywide.

-- General Bureau of Land Transportation (DGTT)

The functions and powers of the DGTT include the planning, direction, coordination, regulation, implementation and supervision of the following activities: (a) studies on proposed investments in land transportation; (b) activities related to highway construction; (c) operations to ensure road maintenance; and (d) activities related to urban traffic and transportation.

The DGTT is headed by a Director-General. Specialized advisory services are provided by (a) the Office of Planning, which helps to define sectoral policy through the supervision and evaluation of studies for investment projects, the continuous updating of DGTT plans and programs, the compilation of statistical data required for analysis, and the assignment of priorities within DGTT programs. This office is also responsible for liaison with international financing agencies, and coordinates the final utilization of loan funds; (b) the Office of the Legal Advisor; (c) the Office of Organization and Methods, which evaluates and updates the structure, functions and information processing of the DGTT. The Bureau also has two supporting units: The Technical Secretariat and the Bureau of Special Studies.

The Offices of the DGTT that will be most involved with the projected roads are: (a) the Bureau of Engineering, which programs, directs, coordinates and executes feasibility studies for projects and develops and maintains updated highway design standards; (b) the Bureau of Construction, which programs, directs, coordinates and supervises the construction of highway infrastructure works in Peru and supervises their execution. It is also responsible for issuing calls for bids on highway projects; (c) the Bureau of Administration, which is responsible for the accounting and financial activities of the MTC; (d) the Bureau of Operations, which regulates, programs, executes and supervises the operation of regional, national and international overland transportation services.

-- Mechanical Equipment Division (SEM):

The "Servicio de Equipo Mecánico" (SEM) is the Division of the MTC which provides the heavy construction equipment needed for road construction and maintenance. The Director of SEM reports directly to the MTC's Director Superior. SEM has a total of 1,980 employees and workers throughout the country. In the Regional Office of Iquitos, which includes the Tarapoto region, the SEM has 19 regular employees and 76 workers.

SEM's equipment throughout the country includes:

N° Units	Construction Equipment	Maintenance Equipment	Vehicles
In operation	213	404	632
Under repair	153	429	399
Total:	366	833	1031

The SEM's equipment assigned to the Regional Office of Iquitos includes:

N° Units	Construction & Maintenance Equipment	Vehicles
In operation	82	41
Under repair	138	54
Total:	220	95

In 1977 SEM has an approved budget of S/.300 million (approximately US $3.7 million) of which S/.15 million (approximately US $185,000) is assigned to the Iquitos Regional Office. In 1978 the SEM will request a total budget of S/.750 million (approximately US $9.3 million) which will be assigned to the Iquitos Regional Office.

-- MTC's Public Investment

The amount of public investment in the transportation sector during 1977 is S/.9,420 million (approximately US $116 million), of which S/.2,815 million (approximately US $23 million) is assigned to the Iquitos Office.

The investment budget for 1977 is mainly directed to the following projects: continuation of the construction of the Huanuco-Aguaytía road which leads into the project area from the South; improvement of the river ports at Iquitos, Pucallpa and Yurimaguas; rehabilitation of the railway system; completion of the Tarapoto-Rio Nieva and the Chamaya-Jaen-San Ignacio roads leading into the Project area from the North Coast; installation of permanent steel bridges in the Huallaga Central Area South of Juanjui; continuation of the construction of the Corral Quemado-Ayar Manco, Ingenio-Quebrada Honda, Puente Paucartambo-Puerto Bermudez, Inambari-Puerto Maldonado and Jenaro-Colonia Angamos roads; and completion of the Iquitos and Arequipa Airports. For the year 1978 the MTC will request the approval of a total budget of S/.11,400 million (approximately US $142 million).

At present and for the near future the MTC's resources are almost completely employed. Mission discussions with the DGTT Chief and his head of the Bureau of Engineering indicate that MTC will only be able to contract private engineering firms for road construction in the Project area and will be unable to perform any of the construction itself for possibly two years. Nevertheless, they have provided a complete list of qualified contractors with experience and interest in jungle road construction and believe there would be no scarcity of bidders for such jobs.

The DCPP has indicated that the MTC would be fully capable of implementing the contracting phase of the project, including the terms of reference for detailed engineering studies and designs, actual construction and supervision. Recent satisfactory experience with MTC in the A.I.D. sponsored Tarapoto road project as well as reports of satisfactory progress in World Bank and IDB projects lead to the conclusion that the MTC is fully capable of undertaking its part in this Project.

vii) The National Office of Natural Resource Evaluations (ONERN)

ONERN is a semi-autonomous agency of the office of the Presidency and operates under the general guidance of The Primo Minister. Its mission is to establish the potential of Peru's natural resources and define their appropriate use in development from the socio-economic point of view.

With approximately 170 personnel including cartographers, geologists, agronomists, economists, civil engineers and selected specialists, ONERN produced, between 1962 and 1974, an impressive series of resource studies covering most of coastal Peru as well as sections of the Andean region and jungle, including Project area. In the view of the Mission many of these studies have been of sufficiently high quality and reliability to serve as basic planning documents for comprehensive subregional or regional development projects.

In all ONERN has produced 47 major resource inventories and studies in its 15 year history. Of these 11 were at the national level e.g., total land and forest resource inventories; 19 were coastal watershed evaluations; two were total natural resource inventories of Sierra regions; and 15 were inventories and evaluations of jungle areas, some in cooperation with FAO. For most of the areas of possible replication of this project, ONERN has developed preliminary resource inventories and soils studies which could serve as the point of departure for definitive assessments.

ONERN is recognized as one of the most capable technical agencies of the GOP. It coordinates closely with INP and the Military Geographical Service as well as other resource planning entities. With some difficulty it has attempted to keep abreast of modern developments in the field of satelite technology in resource identification and evaluation. The Mission is confident that ONERN's participation will be mutually beneficial to the project and to the technical capacity of the institution to provide reliable resource evaluations rapidly and at reduced cost.

b. ANALYSIS OF MANAGEMENT CAPABILITY AND COORDINATION MECHANISMS

Three of five entities involved in the Project are closely linked administratively -- MINFOOD (including EPSA and SENAMA), MINAG and the AGBANK. All are considered fully capable of administering their specific elements of the Project and of closely coordinating their activities. Project elements to be handled by the three include all but the road construction and resource studies, as delineated below:

i) Credit

The AGBANK has an excellent record in the expansion of credit to small and medium farms, particularly in the Project area, where credit has doubled in each of the last two years. Coordination between MINFOOD and the Bank are close and continuous, so that MINFOOD is able to advise farmers on the availability of credit and the Bank is able to project credit needs. This coordination has a legal, organizational and practical basis. It is expected to continue.

ii) Mechanization

Machinery service is internal to MINFOOD through EPSA/SENAMA but requires coordination with the AGBANK since few farmers can hire machinery without credit. SENAMA is a business-like organization with the capacity to respond to effective demand, given the resources to be provided under this Project. It will be important that SENAMA keep close relationship with extension agents in the application of machinery.

iii) Extension

Extension is also internal to MINFOOD's central organization, requiring little coordination other than that already noted under the credit and machinery elements. MINFOOD's zonal personnel have a good grasp of the development needs of the Project area and a growing fund of experience within it. Through its marketing office, MINFOOD is in constant touch with EPSA to fix floor prices and import levels as well as to predict marketing and transportation requirements. These are wll established methods of coordination since EPSA is an agency of the Ministry.

iv) Marketing

Marketing mechanisms for the products of the Project area are well established. At present, only the lack of infrastructure and access prevents EPSA from serving the Project area as it does

other areas of the country. EPSA has both the ability and the incentive to serve the area since its products are strategic to the economy of Peru. Corn, soybean, rice, and sorghum, are all imported in significant quantities.

v) Land Tenure

Land tenure affairs will be handled by MINAG, which has adequate procedures, core personnel, and experience to meet Project requirements.

vi) Resource Studies

Studies of similar development areas will be undertaken by ONERN, which will also assist in monitoring resource use in the Project area. It is expected that ERTS imagery will be employed. ONERN produced the basic resource information for this Project in cooperation with FAO and is now developing experience with satelite imagery. Its technical capacity is excellent and will be enhanced by participation in this Project.

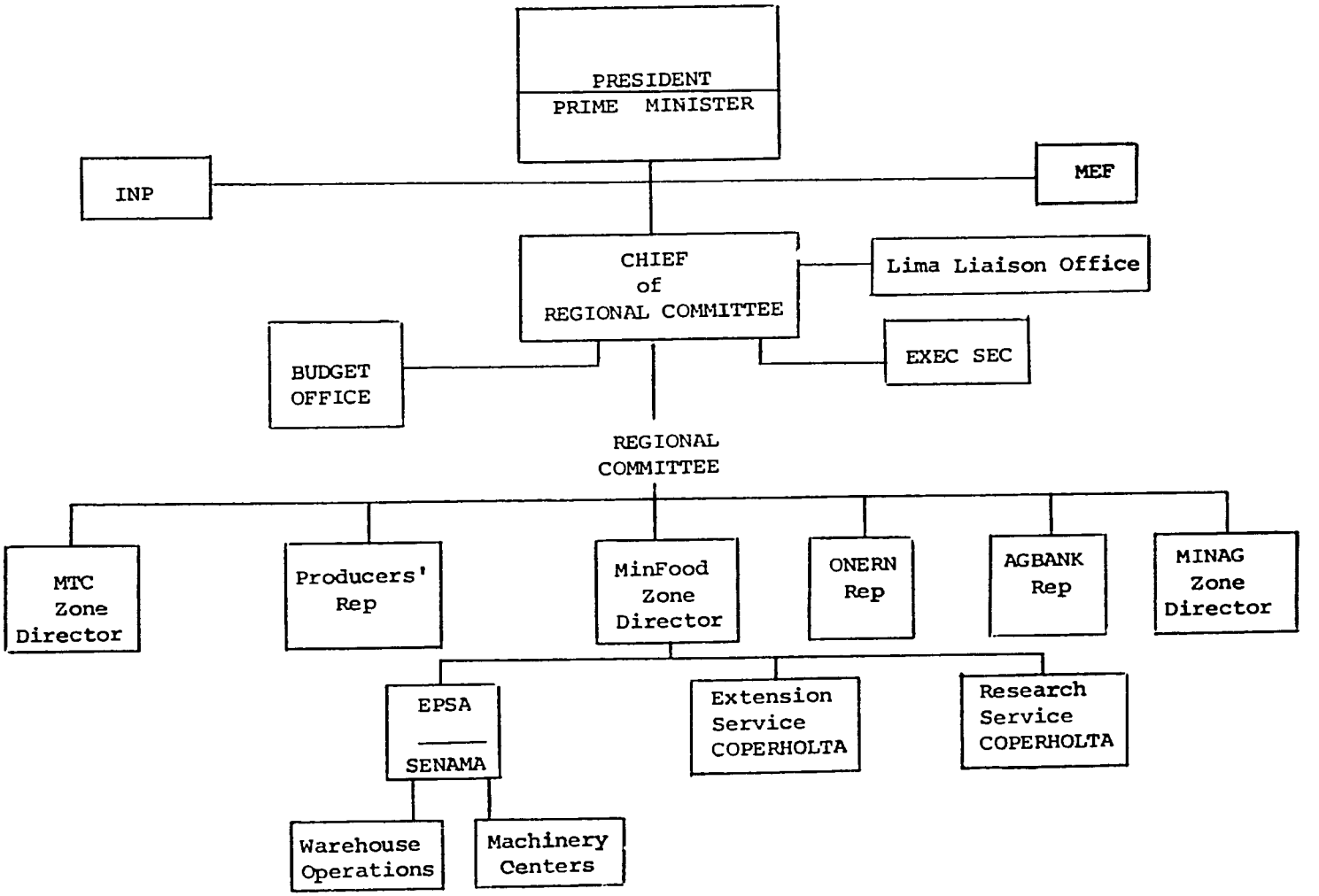
c. ADMINISTRATIVE ARRANGEMENTS

As outlined above in section IV.A.1a Zonal Directors of all the Ministries and other executing agencies will make up the Regional Committee which will implement this Project and other development activities in the Project area. Included in the Committee will be farmer representatives elected through the producers nuclei in the National Production System. The Regional Committee will work under the direction of an appointee of the Prime Minister who will have operational and budgetary authority over all GOP offices in the Department, as illustrated in the following organization chart.

Operating budgets and Project funds, both A.I.D. appropriated and GOP counterpart, will be allocated to the Committee and then to the agency or office implementing a specific Project element or activity.

This arrangement affords an improved ability to orchestrate the entire Project, since virtually all of the authority and responsibility for implementation would reside with the Chief of the Development Committee in the zone. Based on the legislation establishing a regional authority for the neighboring Department of Loreto, the Mission has concluded that a similar arrangement for the Project area would afford the best possible means of coordinating Project activities, with the possible exception of the contracting and procurement functions described in the following paragraphs.

ORGANIZATION CHART
ADMINISTRATIVE AGENCIES



Goods and services procured under the Loan will have their source and origin in Peru and in countries included in Code 941 of the A.I.D. Geographic Code Book. An estimated US.$7.5 million of Loan funds might be used for procurement of imported goods and all services, of which approximately US$6.5 million might be used for the purchase of U.S. construction equipment, machinery, and vehicles. The procurement of these goods is expected to be pursuant to Letters of Commitment procedures, and will comply with A.I.D.'s shipping requirements. Approximately $7.0 million will be used to finance local costs of road construction contracts.

Distance and social and ecological differences make far reaching regional autonomy of loan implementation advisable. This remoteness, however, also impedes management of the procurement function from that area. The scheduled loan financed acquisition of various goods and services (including professional and construction services) requires continued quick access to the business and financial centers at the coast. The Tarapoto area lacks the required communication system to provide the necessary linkage on which the success of the loan will depend. Therefore, the Lima liasion office of the Regional Development Committee will coordinate procurement activities. Procurement specifications will originate from the Regional Committee which will direct the Lima office to proceed with the proposed procurement. The specialized procurement sections of the various Ministries will be used to develop the Project's IFBs.

2. A.I.D.

A.I.D.'s principal active role in Project Implementation will be in the contracting and procurement function where A.I.D.'s approval will be required prior to disbursement, and where advice and assistance will be needed. Such assistance will be required intermittently during the first year of the Project to assure the smooth functioning of the procurement process and compliance with A.I.D. regulations. The USAID will engage the services of a Procurement Advisor on a TDY basis as needed for this purpose. Because much of the detailed procurement work will occur before the first disbursement, the Mission will finance this assistance from the Mission Operational Budget.

During the life of the Project monthly field inspections will be conducted, primarily by USAID engineers and agriculturists. This activity is within the capability of the present Mission staff.

B. Evaluation Plan

This Project provides a concerted response to complex problems in a rapidly developing area that is expected to become a major production center of Peru. Development of the region will offer new opportunities for employment and income for rural families now residing in the area and migrants entering the region from poor over populated areas. The evaluation will focus on several issues: (a) the productivity of the Project area; (b) the efficacy of the physical and administrative infrastructure and services; and (c) the Project's impact on employment, incomes and living conditions of the present population and additional settlers. 1/

During the first two years of infrastructure build-up limited impact can be expected. Roads will be under construction; materials and equipment will be en route. The cadastral process will have been implemented but other Project components will have only begun to develop by the end of the second year

Evaluation during the first two years of the Project will be limited to monitoring and measuring inputs for infrastructure build-up as indicated in the logical framework. Baseline data (e.g. crop production, marketing, land tenure patterns, migration flows, etc.) will be collected in representative communities within the Project area to be able to better assess the long-term socio-economic impact of the Project.

Three levels of Project performance indicators will be utilized in the evaluation, each corresponding to different stages of Project development.

1. Level I indicators will be used to evaluate the first Project implementation and will essentially involve a summary of Project monitoring. The outputs to be measured include:

a. the number of hectares of land cleared, based on SENAMA records and satelite imagery;

b. the number of kilometers of penetration roads constructed based on supervisory reports;

c. the number of land titles normalized;

d. progress made in the amplification of extension services and of the construction of storage facilities.

2. Level II indicators will be evaluated at the end of the second year and in subsequent annual evaluations at which time the

1/ Baseline data will be collected during the early stages of the Project. The Mission's social scientist will coordinate this effort and will be assisted by the Regional Development Committee.

first formal evaluation of the Project will be possible since infrastructure buildup should be nearing completion. Among the level II indicators to be utilized in measuring progress toward meeting established output and Project purpose targets are:

a. measurements of gross production based on EPSA marketing data, cadaster reports and satelite imagery;

b. efficiency of marketing services based on EPSA purchases and shipments weighed against local consumption and gross production;

c. continued progress in land clearing based on SENAMA records and satelite imagery;

d. utilization of farm machinery services based on SENAMA records; AGBANK records and information from the cadastral survey;

e. effectiveness of extension and research functions in serving farm population based on USAID monitoring and inspection, and MINFOOD records;

f. the efficiency of the administrative infrastructure and the institutional arrangements for project implementation will also be reviewed by the end of the second year and in subsequent evaluations.

3. Level III indicators will be measured at the end of the Project and in the final evaluation several years later to ascertain whether longer range targets of the project have been reached. Among these indicators of purpose and goal achievement to be measured include:

a. measurements of gross production based on MINFOOD/ EPSA records;

b. amount of land in crops and in permanent pasture;

c. annual income data by farm size measured through extension records, AGBANK data and cadastral survey;

d. changes in employment patterns.

Since the purpose of this Project is to test a methodology for achievement of optimum use of the economic resources in the high jungle area, it will be useful to evaluate the social implications that attend this new development approach. For this purpose,

social welfare indicators will be established and measured. Although the Project itself contains no provisions for health, education or other social infrastructure, health, nutrition and education data will be collected and used to evaluate the impact of economic development on the standard of living of the Project's beneficiaries. In order to better ascertain the Project's impact on the social welfare of the target group, such welfare indicators as increased access to educational and health facilities, mobility, reduction of class boundaries and increased range of individual choice, will be measured by an attitudinal survey which is contemplated after the termination of the project. The survey techniques applied by the A.I.D. Mission's social scientist will be both formal and informal, and will attempt to ascertain attitudinal changes in the perceptions of quality of life for project beneficiaries. Two groups will be surveyed separately: long-term residents of the area and recent migrants who were attracted to the region for economic self-improvement.

Data from the cadastral process will also be used to measure the impact of the Project on the intended beneficiaries. In their surveys, cadaster teams will be collecting socio-economic data on individual farms in the area. Information will include housing, income, family size and education as well as crops and livestock. Since the cadaster process will be continuous throughout the life of the project, it can provide sufficient baseline data for evaluation purposes.

Resource evaluation studies performed by ONERN as part of the project will furnish a detailed overview of land use at various intervals during the life of the Project. These evaluations will be compared with aerial photos made at the beginning of the project to aid in cadastral work, thus providing accurate measurements of progress in bringing land into cultivation. Satelite imagery will also generate detailed information on the areas planted in specific crops during several stages of the project.

Provision for annual joint evaluations with the participation of A.I.D., INP and the executing agencies will be included in the Project Agreement. These evaluations will measure Project progress during the course of the preceding year against output levels and other indicators listed above as contained in the Log Frame and annual work plans. All inputs will be monitored. The timing of the yearly evaluations will be established by implementation letter.

C. Implementation Plan

The Project implementation plan has two principal objectives: 1) a rapid infrastructure build up during the first two years (penetration roads, machinery parks and marketing facilities) and 2) the early start up and continuation of project components that are on-going in nature (project direction, land surveying and titling, resource inventories and studies, intermediate credit and extension services).

Chart (IV C) 1 shows how the various elements of the Project will be time phased. Infrastructure development starts early in the Project and is completed by the end of the third Project year. All other activities after start up continue throughout life of the project with the exception of the resource inventories and studies. Time phasing in the implementation plan is based on the technical analysis found in Part III A and is consistent with the financial plan found in Part III B.Implementation aspects are further discussed in Section IV.A.

D. Conditions, Covenants and Negotiating Status

The language of the conditions and special covenants proposed for inclusion in the Loan Agreement (in addition to the "standard" provisions) is set forth in Annex H except for three covenants 1/ which will be on the agenda during negotiations. The conditions and covenants are designed to provide adequate safeguards that:

1. the required GOP implementing mechanism and adequate personnel are assigned to the Project;

2. medium-term credit is used in accordance with Project design;

3. adequate short-term production credits are made available to Project farmers;

4. adequate engineering designs and maintenance plans for road construction, marketing collection centers, and machinery parks;

5. that the trunk highway from Juanjui through Tarapoto to Chiclayo will be maintained on an all weather basis.

1/ The covenants are tentatively formulated as follows:

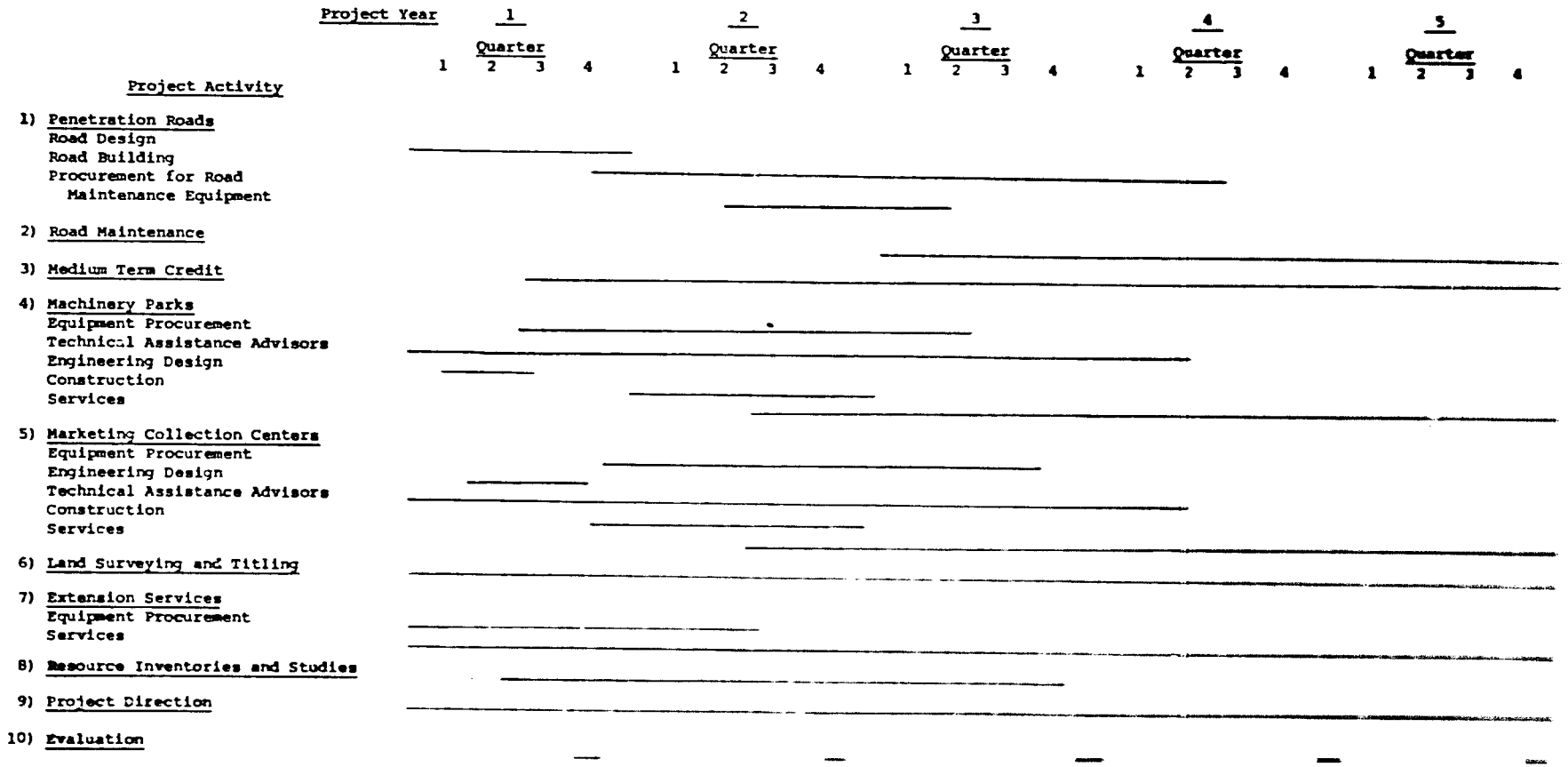
a. The Borrower agrees to make available adequate resources for production credits complementary to the Project.

b. The Borrower agrees to review on an annual basis its food pricing poli with regard to impact on the Project area.

c. The Borrower will take appropriate measures to prohibit illegal production of coca in the Project area.

CHART (IV C) 1

Illustrative Project Implementation Phasing Plan



The project has been developed jointly with the GOT staff from the different agencies involved including the Ministries of Finance, Agriculture, Food, Transportation and DM. The Ministry of Finance has authorized the project through its loan application letter which has been cleared by DM and is set forth in Annex C. To the best of USAID's knowledge, there are no unresolved negotiating issues.

DEPARTMENT OF STATE ACTION COPY

TELEGRAM

ANNEX A

ACTION: AID
INFO: AMB DCM ECON CHRON

UNCLASSIFIED
Classification

STATE 296088
4 DEC 76 11:00AM

R 040401Z DEC 76
FM SECSTATE WASHDC
TO AMEMBASSY LIMA 8867
BT
UNCLAS STATE 296088

ACTION: AGR (FILES)
INFO: PRM
CAP
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AD
ENG

Due date 12/10

Action	Date
	11242
Date	Initials
12/14/76	JM Stone

RECEIVED
USAID
MAIL ROOM
DEC 6 1 35 AM '76

AIDAC

E.O. 11652: N/A

TAGS:

SUBJECT: SUB-TROPICAL LANDS DEVELOPMENT LOAN PRP

THE DAEC REVIEWED SUBJECT PRP ON NOVEMBER 4 AND AUTHORIZED INTENSIVE REVIEW OF PROJECT SUBJECT TO INTERIM CLARIFICATION ON CREDIT COMPONENT OUTLINED BELOW IN PARA 10. THE DAEC REVIEW RESULTED IN THE FOLLOWING GUIDANCE WHICH IS BEING PROVIDED MISSION FOR PREPARATION OF PP:

1. PROJECT STRATEGY: THE DAEC EXPRESSED CONCERN THAT SIMILAR PROJECTS IN LATIN AMERICA, ALSO DEALING WITH THE CONSOLIDATION STAGE OF COLONIZATION, HAVE BEEN RELATIVELY UNSUCCESSFUL DESPITE THE PRESENCE OF ALL INPUTS THAT RESEARCH AND EXPERIENCE DICTATE SHOULD BE INCLUDED. IT IS CONCEIVABLE THAT THE MIX AND TIMING OF SUCH INPUTS MAY BE A CRITICAL ELEMENT IN WHETHER A PROJECT IS RELATIVELY SUCCESSFUL. INTENSIVE REVIEW SHOULD INCLUDE AN EXAMINATION OF PROPOSED PROJECT COMPONENTS TO INSURE THAT A TIMELY AND COMPLEMENTARY MIX EXISTS AMONG THEM. ELEMENTS THAT DO NOT MEET THESE CRITERIA, OR THAT ARE LIKELY TO HOLD BACK OTHER ELEMENTS, SHOULD BE POSTPONED. THE SILO/WAREHOUSING PORTION IS AN EXAMPLE; WILL THIS ELEMENT BE NEEDED CONCURRENTLY WITH ROADS AND LAND CLEARING WHEN IT IS EXPECTED THAT COMMERCIAL PRODUCTION IN THE PROJECT AREA IS LIKELY TO LAG BY SEVERAL YEARS? DATA COLLECTED BY THE UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION (FAO) ON PROJECT AREA CONDITIONS SHOULD BE UTILIZED DURING INTENSIVE REVIEW.

2. INFRASTRUCTURE ANALYSIS: DURING INTENSIVE REVIEW MISSION SHOULD ANALYZE EXISTING SOCIAL AND ADMINISTRATIVE INFRASTRUCTURE IN PROJECT AREAS TO INSURE THAT IT WILL BE ADEQUATE TO SUPPORT AND RETAIN EVENTUAL ANTICIPATED POPULATION OF 15,000 FAMILIES. BASED ON SUCH AN ANALYSIS, THE PP SHOULD INDICATE WHETHER ADDITIONAL INFRASTRUCTURE WILL BE REQUIRED DURING PROJECT EXECUTION AND WHAT WOULD BE MOST APPROPRIATE FINANCING MECHANISM.

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(Formerly FS-412
January 1975
Dept. of State

3. ROAD COMPONENT: THE PP SHOULD ELABORATE ON THIS IMPORTANT COMPONENT OF THE PROJECT. ROADS TO BE CONSTRUCTED UNDER THE PROJECT SHOULD BE SUBSTANTIALLY IDENTIFIED BY THE TIME THE PP IS FINALIZED. DESIGN CRITERIA SHOULD BE INDICATED, AND NECESSARY ENGINEERING STUDIES COMPLETED AND COST ESTIMATES FIRMED (ESTIMATES SHOULD ALSO BE FIRM FOR OTHER CONSTRUCTION ACTIVITIES IN ORDER TO MEET THE REQUIREMENTS OF SECTION 611 OFTHE FAA). DIRECT MISSION INVOLVEMENT IN MONITORING OF THIS COMPONENT SHOULD BE MINIMIZED THROUGH THE ADOPTION OF THE FIXED AMOUNT REIMBURSEMENT METHOD (FAR) OF DISBURSEMENT. THE IN-HOUSE CAPACITY OF THE MINISTRY OF TRANSPORT TO PLAN, CONSTRUCT AND MAINTAIN THESE TYPES OF ROADS (AS WELL AS MAINTAIN EQUIPMENT) SHOULD BE EVALUATED AND ADDITIONAL TECHNICAL AND INSTITUTIONAL NEEDS IDENTIFIED AND TREATED. FINALLY, THE FEASIBILITY OF PROVIDING FOOD FOR WORK SHOULD BE ADDRESSED.

4. LAND TENURE: SINCE LAND TENURE IS A KEY INDICATOR OF GOP COMMITMENT TO PROJECT, AS WELL AS A POSSIBLE CONSTRAINT TO CREDIT UTILIZATION, MISSION SHOULD INCORPORATE LAND TITLING INTO OVERALL PROJECT DESIGN. IN ADDITION, MISSION SHOULD ENCOURAGE GOP TO SUBSTANTIALLY ADVANCE TITLING PROCESS IN PROJECT AREA DURING INTENSIVE REV W PERIOD.

:. TARGET GROUP: INTENSIVE REVIEW SHOULD RESULT IN MISSION INCORPORATION INTO PP OF SPECIFIC CRITERIA FOR SUB-LENDING ACTIVITIES, ROAD ALIGNMENT, AND LOCATION OF WAREHOUSES, EQUIPMENT POOLS AND OTHER PHYSICAL INFRASTRUCTURE, IN ORDER TO INSURE GREATEST IMPACT ON AID'S TARGET GROUP.

6. PROJECT IMPLEMENTATION:
-----A. INSTITUTIONAL COORDINATION. DURING INTENSIVE REVIEW MISSION SHOULD ANALYZE HOW INTER-INSTITUTIONAL ZONAL WORKING COMMITTEE MIGHT BEST BE STAFFED DURING

INTERMINISTERIAL COMPACTS) WILL BE REQUIRED TO INSURE THAT PROJECT IMPLEMENTATION WILL OCCUR ON A TIMELY AND RATIONAL BASIS. THE PP SHOULD SPECIFY THE LEVEL OF DECISION-MAKING WHICH WILL BE REPRESENTED ON THE ZONAL COMMITTEE AND TO WHAT EXTENT DECISIONS RELEVANT TO PROJECT EXECUTION MAY BE MADE WITHOUT RECOURSE TO CENTRAL OFFICES IN LIMA.
-----B. STAFFING. DURING INTENSIVE REVIEW MISSION SHOULD

ADDRESS CURRENT AND ANTICIPATED STAFFING LEVELS OF VARIOUS COOPERATING AGENCIES IN THE ZONAL OFFICE AND INDICATE A TIME FRAME FOR STAFF BUILD-UP IN LIGHT OF CURRENT DEFICITS AND EXTRA REQUIREMENTS DUE TO ANTICIPATED PROJECT ACTIVITIES. THE PP SHOULD GIVE PARTICULAR ATTENTION TO MINFOOD EXTENSION SERVICE REQUIREMENTS AND INDICATE WHERE ADDITIONAL EXTENSION AGENTS WILL BE RECRUITED, THEIR LEVEL OF EXPERTISE AND HOW EXTENSION EFFORTS WILL BE COORDINATED WITH OTHER AGENCY ACTIVITIES.

7. APPROPRIATE TECHNOLOGY. DURING INTENSIVE REVIEW MISSION SHOULD ANALYZE HUMAN AND CAPITAL RESOURCE CAPACITY OF PROJECT AREA, AS WELL AS PHYSICAL CHARACTERISTICS, IN ORDER TO DETERMINE MOST APPROPRIATE TECHNOLOGY FOR ANTICIPATED ROAD CONSTRUCTION AND LAND CLEARING ACTIVITIES, AS WELL AS EQUIPPING OF MACHINERY POOLS AND WAREHOUSE FACILITIES. TECHNOLOGY MIX SHOULD BE IDENTIFIED IN VIEW OF THE POSSIBLE SCARCITY OF LABOR IN PROJECT AREAS AS SETTLERS CONCENTRATE ON THEIR PARTICULAR PLOTS OF LAND.

8. SUBSIDIES: PP SHOULD ADDRESS THE EXTENT TO WHICH CREDIT AND EQUIPMENT RENTAL WILL BE SUBSIDIZED AND DETERMINE WHETHER A MAINTENANCE OF VALUE PROVISION WOULD OE AN APPROPRIATE MECHANISM TO INSURE PROGRAM CONTINUITY FOLLOWING LOAN DISBURSEMENT.

9. TECHNICAL ASSISTANCE: DURING INTENSIVE REVIEW MISSION WILL ASSESS TECHNICAL ASSISTANCE REQUIREMENTS FOR PROJECT SUCCESS, AND INDICATE WHAT ADDITIONAL ASSISTANCE WOULD NEED TO BE INCORPORATED INTO PROJECT DESIGN IF DUTCH COPERHOLTA TEAM TERMINATES ITS PROGRAM.

10. INTERMEDIATE AND LONG TERM CREDIT: AN INTERIM REPORT IS REQUESTED TO ADDRESS POINTS RAISED DURING THE DAEC REVIEW ON THE RATIONALE FOR A DISTINCT INTERMEDIATE AND LONG TERM CREDIT FUND TO FINANCE FARM IMPROVEMENTS AND AGRO-INDUSTRIES IN THE PROJECT AREA. SPECIFICALLY THE MISSION SHOULD ASSESS THE PROBABLE DEMAND FOR SUCH CREDIT AMONG TARGET GROUP IN PROJECT AREA AND EXPLORE WHETHER THIS DEMAND COULD BE MET UTILIZING FUNDS WHICH

UNCLASSIFIED
MAY BE AVAILABLE UNDER THE PROPOSED AGRICULTURAL SERVICES PRODUCTION FUND LOAN. THE REPORT MAY BE SUBMITTED SEPARATELY OR BE INCORPORATED INTO THE INTERIM REPORT REQUIRED FOR THE AGRICULTURAL SERVICES PRODUCTION

DEPARTMENT OF STATE

TELEGRAM

FUND LOAN

11. TDY ASSISTANCE: DURING INTENSIVE REVIEW LA/DR AND DOT WILL PROVIDE TDY ASSISTANCE TO CONDUCT LAND USE INVENTORY IN PROJECT AREA USING REMOTE SENSING TECHNIQUES AND ASSIST IN ECONOMIC AND FINANCIAL ANALYSIS.

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

ANNEX B

Exhibits 1, 2, and 3

PERU Sub-Tropical Land Development

ANNEX B
Exhibit I

ENGINEERING ANALYSIS

A. ROAD CONSTRUCTION PROGRAM

1. General
2. Design Criteria
3. Description of Road Construction Work
   - 3.1. Earthwork - Grading
     - 3.1.1. Flat Terrain
     - 3.1.2. Rolling Terrain
     - 3.1.3. Mountainous Terrain
   - 3.2. Road Surfacing
   - 3.3. Drainage
   - 3.4. Bridges
4. Cost Analysis
   - 4.1. Methodology
   - 4.2. Unit Prices
   - 4.3. Engineering and Supervision Costs
   - 4.4. Total Construction Cost and Cost per Kilometer
5. Engineering Plan for Project Execution
   - 5.1. Preliminary Design
   - 5.2. Studies, Design and Preparation of Plans and Specifications
   - 5.3. Selection of Construction Contractors
   - 5.4. Construction Arrangements
   - 5.5. Construction Supervision
   - 5.6. USAID Monitoring
6. Road Maintenance
   - 6.1. Maintenance Equipment
   - 6.2. Estimation of Maintenance Cost
7. Methodology Used for Cost Estimation
   - 7.1. Earthwork
   - 7.2. Overhaul
   - 7.3. Road Surfacing
   - 7.4. Drainage
   - 7.5. Bridges
   - 7.6. Breakdown of Construction Costs
8. Engineering Conclusions

Table 1 - Location Map
Table 2 - Typical Sections

B. BUILDING CONSTRUCTION PROGRAM

A. ROAD CONSTRUCTION PROGRAM

1. GENERAL

The Project will finance the construction or rehabilitation of six rural roads with a total length of 175 Km. These roads will run along valleys tributary to the Huallaga river and will connect their agricultural production areas to the existing Tarapoto-Juanjui highway. On five of the proposed routes there are already sub-standard dry weather, third class roads according to Peruvian standards. One of the projects will involve complete new construction and another one will require new construction for approximately 50 percent of its length and rehabilitation on the remaining 50 percent.

The Tarapoto-Juanjui road runs along the west bank of the Huallaga river and is a part of the Marginal Jungle Highway. Its 136 Km. are transitable the year round. It was built in 1966 - 1969 and was partially financed with an AID PL-480 Loan. With the completion this year of the Olmos-Tarapoto road, the sector of the Huallaga valley between Tarapoto and Juanjui will be permanently linked to the coastal Panamerican Highway.

Four of the valleys served by the proposed rural roads are on the west side of the Huallaga river and two are on the east side. Since the Tarapoto - Juanjui road is on the west side, there will be need of two ferry-boats to cross the Huallaga and gain access to the Eastern valleys.

2. DESIGN CRITERIA

The design criteria to be used for the engineering work on the seven rural roads will be in accordance with the AASHO geometric standards for roads with an ADT of under 100, modified to conform to Peruvian Third Class Highway Standards as follows:

Terrain	Design Speed	Maximum Grade	Maximum Radius (Meters)	Minimum Sight Distance (Meters)
Flat	50 KPH	5.0	65	60
Rolling	35	5.0-7.0	30	38
Mountainous	25	7.0-10.0	15	25

The final section of the roads will be designed for a road bed of 4.0 m. This will include one traffic lane of 3.00 m.

(app. 10 feet) with minimum 3% slopes and with 0.50 m. shoulders over all sections. Cut slopes will generally be 1.5:1. The road will be surfaced with a 0.20 thick course of selected granular material. Side ditches and culverts will also be provided as well as wooden or steel and concrete bridges for the crossing of all the rivers and streams with the exception of the Huallaga river. The consulting firm P. & V. has developed several typical cross sections for fill, cut and hillside conditions for various possible types of terrain.

In order to allow passing and overtaking the road bed will be widened approximately every 200 mts. to a width of 6.00 m. The length of these turn-out sections will be of approximately 40 mts.

Upgrading of the existing dry weather roads will include compaction, elevation and widening of the road bed with the addition of the surface course and the drainage facilities. Typical Road Sections are attached to this Section.

3. DESCRIPTION OF ROAD CONSTRUCTION WORK

3.1. EARTHWORK - GRADING

3.1.1. Flat Terrain

For clay soils with organic material, high plasticity and high moisture content, the elimination of 0.30 of top soil and its replacement by selected fill material will be needed; the fill embankment will be built 0.60 m. to 0.90 m. thick and compacted to densities between 90 and 95% of the maximum density; and the subgrade or road platform will be leveled.

For non-plastic soils with good bearing capacity, there will be no need to eliminate the top soil. The road embankment will be 0.30 m. thick.

3.1.2. Rolling Terrain

The work will involve the widening of the road prisms in the case of the existing trails and the construction of a new section for new roads or in the case of change of alignment. The road bed will also be levelled and, at both ends, will slope down 1.5:1. On the hill side, the slope of the cut will generally be 1:3.

3.1.3. Mountainous Terrain

The earthwork will involve either the widening of an existing section entirely or partially in cut or the construction

of a completely new section. Road platform will be levelled and at both sides, it will slope down 1.5:1. On the hillside, the slope of the cut will generally be 1:5.

3.2. ROAD SURFACING

A 20 cm. thick sub-base of selected granular material will be placed on a width of 3.00 m. of all roads. In general, the material will consist of granular material of low plasticity and will include gravel of sizes below 10 cm. This material will be obtained from nearby quarries, transported to the road site and compacted to a density at not less than 95% of the maximum obtained by the Modified Proctor Method.

3.3. DRAINAGE

It is anticipated that on the average, three 36 inch diameter culverts will be installed in each kilometer of road. Drainage ditches will be constructed along the full length of the roads, with cross sections varying from 0.5 to 1.5 square meters according to the type of soild and precipitation records. In extreme conditions, the work will also include the installations of perforated pipe.

3.4. BRIDGES

Some small creeks may be crossed with temporary structures of wood or timber. For larger creeks small permenent concrete or steel bridges may be constructed. The main crossings requiring larger structures are: The Sisa river (50 m. to 60 m.) Bombanajillo (10 m.), Ponasillo (15 m.), Eslabon (15 m.), Piscoyacu (15 m.) and Sacanche river (50 m.). Some of the existing roads already have permanent bridges such as the ones on the Saposoa, Balsayacu, and Ashcoyacu rivers.

With regard to the crossing of the Huallaga river to gain access to the Valle Biabo and Ponaza roads, there will be need of motor powered ferries since the width of the river is at least 250 meters wide and carries large trees and other debris. Cable ferries would require towers 25 to 30 meters high. Special foundation and anchorage problems would exist. To cross the river with heavy construction equipment, rafts can be joined with a top platform to carry loads of up to 12 tons under optimum conditions.

4. COST ANALYSIS:

4.1. METHODOLOGY:

For the purpose of estimating the road construction costs, unit costs per kilometer have been determined for each one of the nine typical cross sections developed. The unit prices for each

item of work, are based on the unit prices used by the Ministry of Transportation and Communications for bidding in February 1977 on the La Coipa - Rumipite road. This road is also located in the high jungle area and has similar characteristics to the proposed Huallaga roads, with regard to design, location, topography, geology and climate.

For the earthwork, in addition to the costs of excavation, filling and levelling, overhaul costs for borrowed material have been estimated based on the distances to the known or likely borrow pits. The cost of the road surfacing is also based on the distances to the possible sources of the required granular sub-base material which have been tentatively identified.

The consulting firm P. & V., using a field inspection and available maps and aerophotographs has selected the route of each road, the typical cross sections which are most adequate to the topography and soil conditions. Similarly, one of five possible drainage solutions has been selected for each section of road. With regard to bridges, all stream crossings have been identified and construction costs have been estimated according to length.

In Section 7, we describe in greater detail the methodology used for the cost estimation.

4.2. UNIT PRICES:

The unit prices considered for the main items of work are the following:

Item	Unit	Unit cost (US$)
General Excavation	cub. mt.	1.00
Rock Excavation	cub. mt.	2.00
Fill (excab. material)	cub. mt.	0.50
Borrow Fill	cub. mt.	1.50
Grading	sq. mt.	0.17
Sub Base	sq. mt.	0.55
Overhaul	cub.Mt./Km. (average distance = 5 km)	0.68
36 in. metal culverts	m.	131.25
Drainage ditch (1.5 sq.mt.)	m.	3.13
Drainage ditch (0.5 sq. mt.)	m.	1.13

4.3. ENGINEERING AND SUPERVISION COSTS:

Based on local experience, we have assumed that the Engineering Costs will amount to approximately 4% of the cost of construction (approx.$270,000) while the supervision and inspection costs will be in the order of 6% (approx. $400,000).

4.4. TOTAL CONSTRUCTION COST AND COST PER KILOMETER

The cost estimates developed by the firm P. & V. are based on the adoption of sections with a 6.00 meter road bed along the entire length of the roads. The estimated total construction cost for this design including 10% for engineering and supervision amounts to $9,660,000. for the 174.1 km. The average construction cost per kilometer varies from $32,000 f for the Sacancha - Saposoa road to $69,610 for the new Ponaza Valley road. The overall average cost per kilometer for the seven roads is $55,480.

By using a 4.00 meter road bed, with 6.00 meter crossing platform every 200 meters construction costs may be reduced by approximately 25%. USAID has reestimated the construction costs for each road, following the same methodology used by P. & V. for the 6.00 meter section. The total construction costs under these conditions would amount to $7,470,000 with an average cost per kilometer of $42,906. In the following chart. total and unit construction costs for each road are presented:

ROAD CONSTRUCTION COSTS

Road	Length (Km.)	6 mt.Road Bed		4.mt. Road Bed with passing platforms	
		Total Cost (US$)	Cost per Km. (US$)	Total Cost (US$)	Cost per Km. (US$)
1. Bellavista-San Pablo	34.0	1,428,000	42,000	1,056,000	31,060
1.A. San Pablo-San José	35.5	2,224,000	62,650	1,785,000	50,281
2. Biabo Valley	31.8	2,006,000	63,900	1,588,000	49,937
3. Ponaza Valley	30.0	2,088,000	69,610	1,642,000	54,733
4. P cacaca - West Valley	10.3	523,000	50,840	381,000	37,030
5. Bs. Aires-Paujilsapa	12.5	752,000	60,190	559,000	44,740
6. Sacanche - Sapozoa	20.0	638,000	31,903	458,000	22,900
	174.1	9,659,000	55,479 (Average	7,470,000	42,906 (Average)

In Section 7 of this Annex we present a breakdown of the construction costs for each one of the six roads.

5. ENGINEERING PLAN FOR PROJECT EXECUTION:

5.1. PRELIMINARY DESIGN

Preliminary layouts and typical sections have been prepared by the local consulting firm P. & V. Ingenieros S.A. based on existing plans, aerophotographs and inspection of the existing trails. Since the general topography, drainage patterns and soil types are known, cost estimates, based on predetermined cross sections and the length of roads have been developed on a fairly firm basis. The amount of improvement work was estimated by field inspection of the existing roads.

5.2. STUDIES, DESIGN AND PREPARATION OF PLANS AND SPECIFICATIONS:

The preparation of project studies, plans and specifications will be contracted by the MTC from the private sector. Such services will be solicited from elegible firms simultaneously pre-qualified for the job and subject to the written approval of AID. The selected consultant will be responsible for carrying out the engineering survey, soils studies and the final design.

The engineering surveying will include the determination of the center line alignment with profile and of the location of culverts. This will provide sufficient information for the design. In the case of the existing roads, no location surveys are required but, where it appears that a change in alignment would result in a better design or in a less expensive construction, the necessary surveys will be done to make the determination.

Soils studies are proposed for each road sub-project to determine the plasticity and bearing capacity of the soils. For this purpose, hand auger borings to a depth of about 2 mts. will be made at intervals of approximately 200 mts. Small samples of representative materials will be taken for laboratory classification tests. Several sources of selected fill and surfacing materials have already been identified. However, further investigation and testing of these deposits will also be required prior to the construction.

Conceptual drawings and preliminary layouts, based on the engineering surveys and soils studies will be submitted for the review and approval of the MTC and AID prior to the final preparation of the contract drawings.

In general, final plans for each sub-project will be simple. They will include centerline profiles and alignment and cross sections. Details of drainage structures, bridges and unusual soil conditions

will complete the requirements for the construction plans. Final plans and specifications for all six roads may then be completed in 6 to 8 mos.

5.3. SELECTION OF CONSTRUCTION CONTRACTORS

All construction will be done by private contractors. All contracts will be awarded by the MTC through public bidding. It is anticipated that there will be separate contracts for each road. This will permit bidding for the construction contract for each road as soon as the bidding documents are ready.

Contractors from Peru and Code 941 countries will be invited to bid. Invitation for bids will be published in the Commerce Business Daily and in the local press. There is an ample supply of local firms with the experience and equipment to construct the roads successfully. All qualified firms in Peru and Code 941 countries will be allowed to submit price proposals and contracts will be awarded to the lowest responsive bidder in accordance with Manual Order 11.

5.4. CONSTRUCTION ARRANGEMENTS

The MTC will enter into contract with the selected contractors. AID will review and approve in writing all the construction contracts and subsequent modifications to such contracts including all subcontracts.

To the extent possible, construction work will be scheduled to start at the beginning of the dry season. Contract construction periods will depend on the size of each job. It is estimated however that they will vary between 18 and 24 months with all six roads completed within a period of 36 months.

5.5. CONSTRUCTION SUPERVISION

All construction work will be supervised by the MTC either directly or through an engineering firm. To that end, a supervisory office will be established in the project area under the direction of a qualified engineer with ample experience in road construction in the jungle area. Full time engineering specialists on soils mechanics and road construction will also be assigned to the supervisory office. Specialists on geology and bridge construction will be assigned on an "as needed basis". The MTC's Construction and Engineering Divisions will provide support to the Supervisory Office during the period of construction.

The Supervisory Office will inspect all construction work to ensure its compliance with approved plans and specifications. For this purpose it will conduct all the controls and tests required to ensure that project specifications and general sound construction practices are being followed by the contractors. The office will have technical support personnel in adequate number to conduct all controls and tests.

The Supervisory Office will also review and approve all payment requests submitted by the contractors and will have the authority to approve minor changes in plans and specifications.

5.6. USAID MONITORING

USAID/Engineering/Lima will conduct periodic site inspections to all construction sites. The construction progress and the findings of these field inspection visits will determine the frequency of the USAID Engineering site visits, although it is anticipated that on average there will be a visit per month.

6. ROAD MAINTENANCE

The Zonal Office of the MTC will be responsible for the following maintenance of the roads constructed under the Loan Program. Since past experience indicates that road maintenance by the MTC is generally poor due to the lack of adequate equipment, Loan funds will be used on the procurement of basic maintenance equipment for the six roads.

6.1. MAINTENANCE EQUIPMENT

The list and estimated costs of the required maintenance equipment are shown below:

Equipment Unit 1/	No.	(US $) Per Unit	Total
Truck, dump, 5 CY, 27500 GVW	6	26,000	156,000
Truck, stake body, 27,500 GVW	1	23,000	23,000
Truck, fuel, 1500 gal; 27,500 GVW	1	28,000	28,000
Truck, water, 1500 gal; 27,500 GVW	1	28,000	28,000
Truck shop, w/equip., 27,500 GVW	1	76,000	76,000
Truck, pickup, 4X2	2	7,250	14,500
Trailer, grease, w/air compressor	1	10,000	10,000
Motor grader, 6X4, 125 HP w/scarifier rigid frame	3	54,000	162,000
Loader, front end, pneumatic, ZCY	1	45,000	45,000
Tractor, crawler, 130 HP w/angle blade & scarifier	1	76,000	76,000
Air compressor, portable, 150 CFM	1	15,500	15,500
Roller, Pneumatic, self-propelled 4-14 Ton	1	25,500	25,500
Tilt Trailer	1	15,000	15,000
Sub-Total estimated cost, FAS port of exit			674,500
Spare parts, 25%			168,625
Sub-Total			843,125
Freight & Insurance, 15%			126,468
Sub-Total			969,593
Escalation/contingency			80,407
Total Estimated CIF cost			$1,050,000

6.2. ESTIMATION OF MAINTENANCE COSTS

The consulting firm P. & V. has developed a formula for road maintenance costs, based on practices recommended by the firm Roy Rogersen and Associates which is at present carrying out a study on maintenance systems for the Ministry of Transportation and Communications. The formula for the annual maintenance cost for kilometer is the following:

$$C = 23{,}156\, A^{0.0329}\, CMSR$$

The correction factors A, G, M, S and R take into account the following variables:

A = Daily traffic and type of vehicles

G = Geographical area

M = Type of maintenance

S = Type of surfacing

R = Rain precipitation records

For a preliminary estimate, the correction factors corresponding to the following conditions have been used:

1/ This equipment will be used both for maintenance and for developing access trucks off of the penetration roads.

average daily traffic of 20 two axle trucks, high jungle area, permanent maintenance, no asphalt surfacing, and an annual total rain of over 1000 mm. Since the formula is based on the April 1976 Sol value, the exchange rate to the dollar corresponding to that data has also been used.

The maintenance cost obtained with the formula is of $735 per year for kilometer or $129,000 per year for the 175 kilometers of roads.

Since this estimate appears to be rather low, we have developed cost analysis based on the replacement value of the equipment and the normal operating expenses including maintenance and spare parts for the equipment. The maintenance cost obtained through this method is approximately $2,200 per kilometer per year. However, considering that some of the new equipment will also be used for the maintenance of the Tarapoto-Juanjui road, it would be more realistic to assume for the project roads a maintenance cost of $1,500 per kilometer per year. This would lead to a total of $262,000 per year for the 175 kilometers of new roads.

7. METHODOLOGY USED FOR COST ESTIMATION

7.1 EARTHWORK

Quantities for excavation, fill and grading work have been determined for each one of the eight typical sections both for 6 meter and 4 meter road beds. Applying the unit prices listed in Section 4.2 of this Annex, costs per kilometer have been determined for each type of section. To illustrate this procedure, quantities and costs per kilometer for Section A.1.2 are given below:

WORK ITEM	UNIT PRICE ($)	6.00 m. Roadbed		4.00 m. Roadbed	
		Quantity (m^3/Km)	Cost ($/Km)	Quantity (m^3/Km)	Cost ($/Km)
Excavation (m3)	1.00	2,600	2,600	2,000	2,000
Borrow Fill (m3)	1.50	9,600	14,400	6,800	10,200
Grading (m2)	0.17	6,000	1,020	4,000	680
COSTS PER KILCMETER			18,020		12,880

The costs per kilometer obtained for each one of the typical road sections are the following:

SECTION		Costs per Kilometer	
		6.00 m. Roadbed	4.00 m. Roadbed
Level	A.1.2	18,037	12,900
	A.1.3	12,938	9,500
	A.2	3,825	2,600
Rolling	B.1	8,475	4,250
	B.2	10,725	8,850
Mountainous	C.1.1	22,800	11,400
	C.1.2	19,325	9,680
	C.2.1	29,637	17,875
	C.2.2	49,475	28,725

7.2 OVERHAUL

Required quantities of borrow material per kilometer of road have also been estimated for each one of the typical road sections. Overhaul costs for each section of road have then been determined based on the distances to the borrow pits. For instance, Section II of the Ponaza Valley road has a total length of 20.5 Km. and for a 6.00 m. roadbed requires 196,800 cu.mts. of borrow material. With an average hauling distance of 4.0 kilometers and an overhaul cost of $0.75 per cu.mt./kilometer, the total overhaul cost would be $588,600.

0.75 x 4.0 x 196,200 = $ 588,600

For a 4. mts. road bed the quantity of borrow fill is 139,400 cu. mt. and the overhaul cost $418,200.

0.75 x 4.00 x 139,400 = $ 418,200.

7.3 ROAD SURFACING

The cost of the 0.20 meter thick road surfacing has been estimated in $0.55 per sq.mt. In addition, there are the overhaul costs, estimated in the manner described in the previous paragraph. Following the example of the 30 km. long Ponaza Valley road, the total cost for a 6.00 mt. road bed would be $83,250 for the construction and $100,230 for the overhaul. These costs are reduced to $44,400 and $53,120 respectively for a 4.00 m. road bed.

7.4. DRAINAGE

Different drainage solutions have been considered in accordance with the nature of topography and soils. Costs per kilometer vary from $5,160 to $15,475. A drainage solution has been chosen for each section of the roads and total costs per road have been computed. Costs for the 4.00 mts. road bed are estimated to be 70% of the costs for the 6.00 meter road bed. In the cost of the Ponaza Valley Road total drainage costs are estimated in $221,000 for a 6.00 meter road and $155,000 for the 4.00 meter road bed.

7.5. BRIDGES

All stream crossings have been identified. The cost of the small bridges has been estimated in $4,375 per meter. The cost of the larger bridges has also been estimated based on local experience. For instance, in the case of the Ponaza Road, there are four small stream crossings with a total length of 43 mts. and an estimated total cost of $190,625. Large bridges are not required but one ferry is necessary to cross the Huallaga river.

7.6. BREAKDOWN OF CONSTRUCTION COSTS:

In the following chart there is a breakdown of the estimated construction costs for each one of the six roads. Costs have been divided among the four major work activities. A 10% for engineering and supervision costs. Costs of the farries have been estimated at $50,000 each.

BREAKDOWN OF CONSTRUCTION COSTS

(in thousands of US$)

ROAD / WORK ITEM	BELLAVISTA SAN PABLO	SAN PABLO SAN JOSE	BIABO	PONAZA	PAUCACACA	BUENOS AIRES	SACANCHE
EARTHWORK	385,	536,	806,	762,	205,	319,	126,
PAVEMENT	100,	97,	93,	98,	29,	40,	56,
DRAINAGE	179,	223,	156,	155,	52,	64,	104,
BRIDGES	131,	529,	159,	237,	-	-	56,
SUB-TOTAL: 1	795,	1,385,	1,214,	1,252,	286,	423,	342,
MINOR STRUCTURES AND OTHER WORK - 10%	80,	139,	121,	125,	29,	42,	34,
SUB-TOTAL: 2	875,	1,524,	1,335,	1,377,	315,	465,	376,
ENGINEER AND SUPER-VISION 10%	88,	152,	134,	138,	31,	46,	38,
SUB-TOTAL: 3	963,	1,676,	1,470,	1,515,	346,	511,	414,
ROAD WIDEN-ING FOR PASSING PLATFORMS	93,	109,	118,	127,	35,	48,	44,
TOTAL:	1,056,	1,785,	1,588,	1,642,	381,	559,	458,

8. ENGINEERING CONCLUSIONS

- All aspects of the project have been investigated to determine their technical feasibility.

- Field surveys indicate that approximately 84% of the total road length will be constructed over flat or rolling terrain with transverse slopes from 0° to 35°. Therefore, excavation work will be minimal, although there will be need of considerable amounts of borrow material to construct the fill embankments.

- Road sections over high plasticity clayey soils are minimal. In this case the top layer of soil will be removed and replaced with selected material, and 0.90 m. embankment will be constructed with same material.

- Suitable borrow pits for selected fill and for surfacing material have been located along all the routes.

- Drainage does not seem to pose any particular technical problems. Both, longitudinal and transverse drainage will be provided.

- It will be necessary to study in detail all the stream crossings in order to adequately locate and design all the needed bridges.

- Due to the considerable width of the Huallaga river, motor ferries will be required for gaining access to the two roads located at the east side of the valley.

- No problems are anticipated with regard to procurement of engineering and construction services. There is a good supply of local firms with the experience and equipment to construct the roads successfully.

- Skilled labor will have to be brought from Lima and other cities but workers in the project area can meet minimal requirements for unskilled labor.

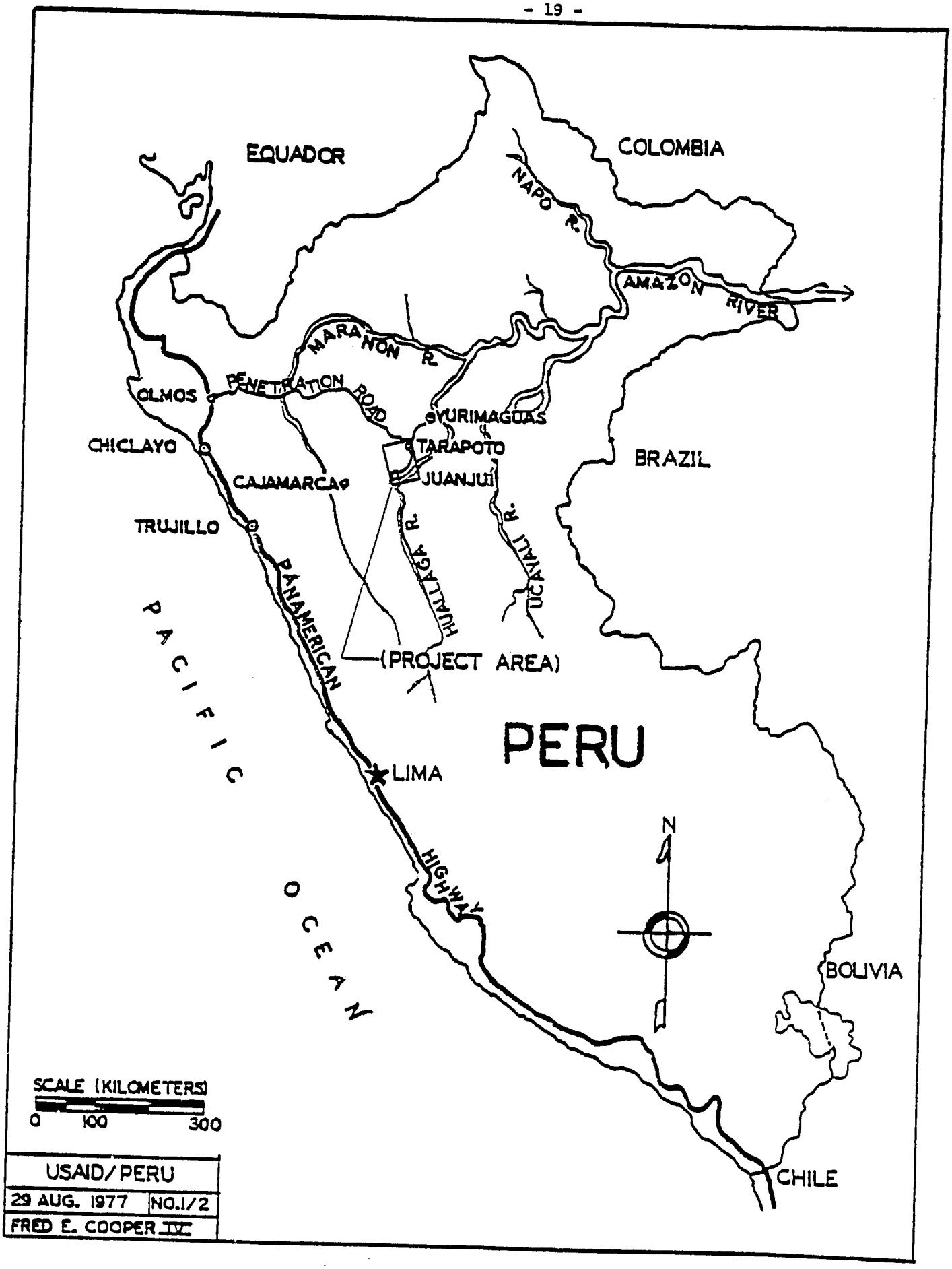
- It is estimated that all the road construction work will be completed within a period of 36 months.

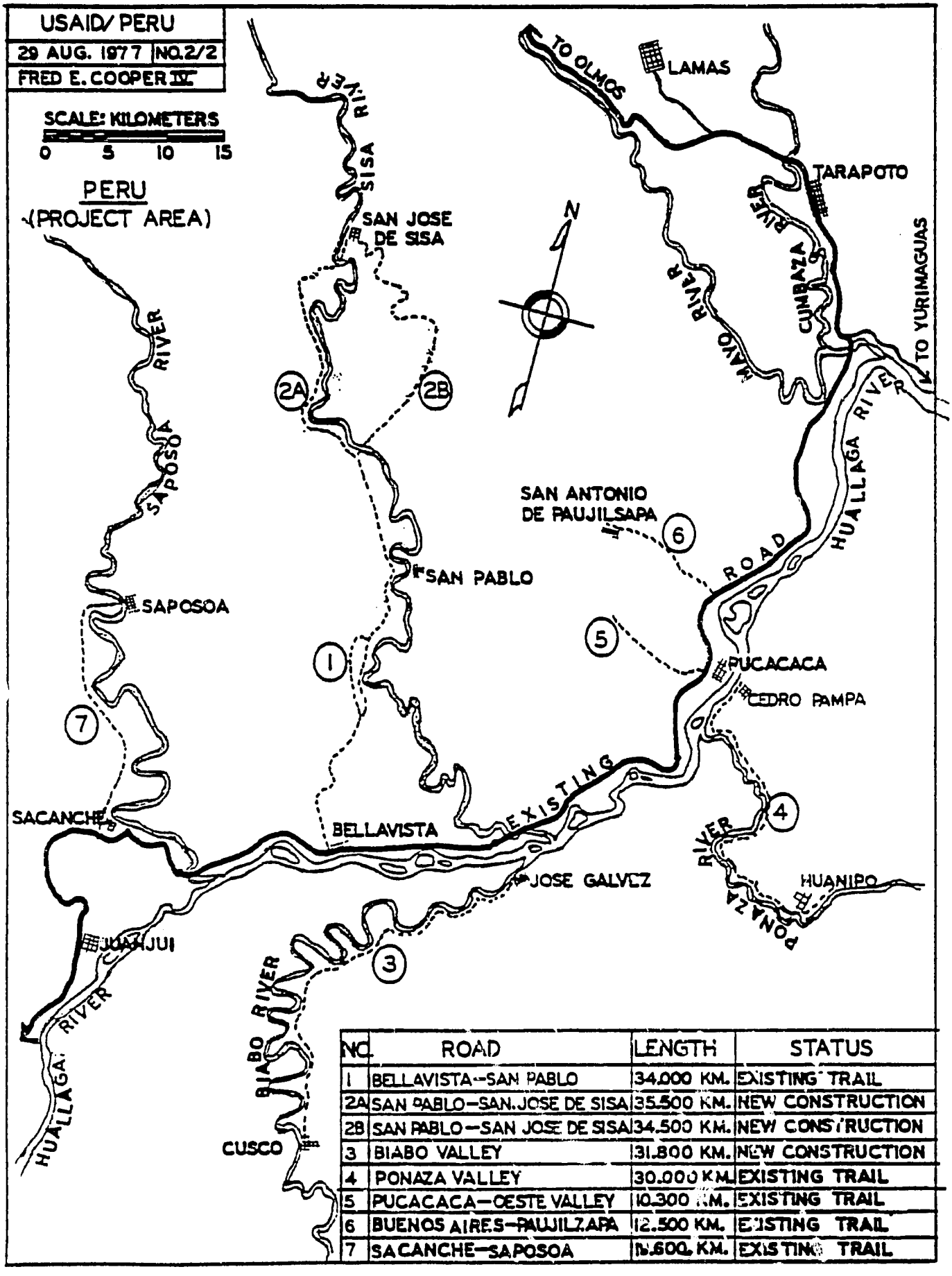
- Road maintenance in the jungle area has always presented problems due to the fact that the MTC lacks adequate equipment

for this work. However, since the Loan will be financing the required maintenance equipment, it is expected that the MTC will keep the project roads in adequate conditions and that they will be transitable the year round.

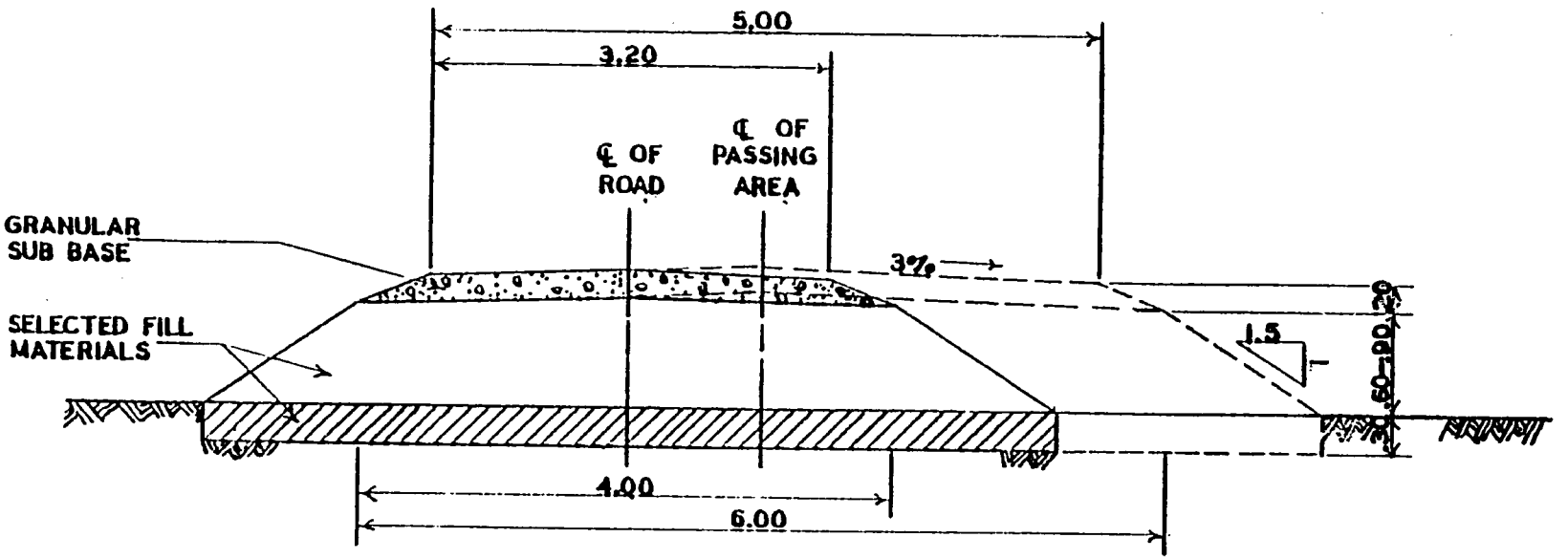
- Cost estimates for engineering, construction and maintenance have been carefully developed and are considered reasonably firm.

- Based on all the above, the project from an engineering standpoint is considered feasible.


EQUADOR
COLOMBIA
NAPO R.
AMAZON RIVER
MARANON R.
PENETRATION ROAD
OLMOS
YURIMAGUAS
TARAPOTO
CHICLAYO
BRAZIL
CAJAMARCA
JUANJUI
TRUJILLO
HUALLAGA R.
UCAYALI R.
PANAMERICAN
(PROJECT AREA)
PACIFIC OCEAN
PERU
LIMA
N
HIGHWAY
BOLIVIA
CHILE
SCALE (KILOMETERS)
0 100 300
USAID/PERU
29 AUG. 1977 NO.1/2
FRED E. COOPER IV



NO.	ROAD	LENGTH	STATUS
1	BELLAVISTA–SAN PABLO	34.000 KM.	EXISTING TRAIL
2A	SAN PABLO–SAN JOSE DE SISA	35.500 KM.	NEW CONSTRUCTION
2B	SAN PABLO–SAN JOSE DE SISA	34.500 KM.	NEW CONSTRUCTION
3	BIABO VALLEY	31.800 KM.	NEW CONSTRUCTION
4	PONAZA VALLEY	30.000 KM.	EXISTING TRAIL
5	PUCACACA–OESTE VALLEY	10.300 KM.	EXISTING TRAIL
6	BUENOS AIRES–PAUJILZAPA	12.500 KM.	EXISTING TRAIL
7	SACANCHE–SAPOSOA	15.600 KM.	EXISTING TRAIL



TYPICAL "FILL" SECTION

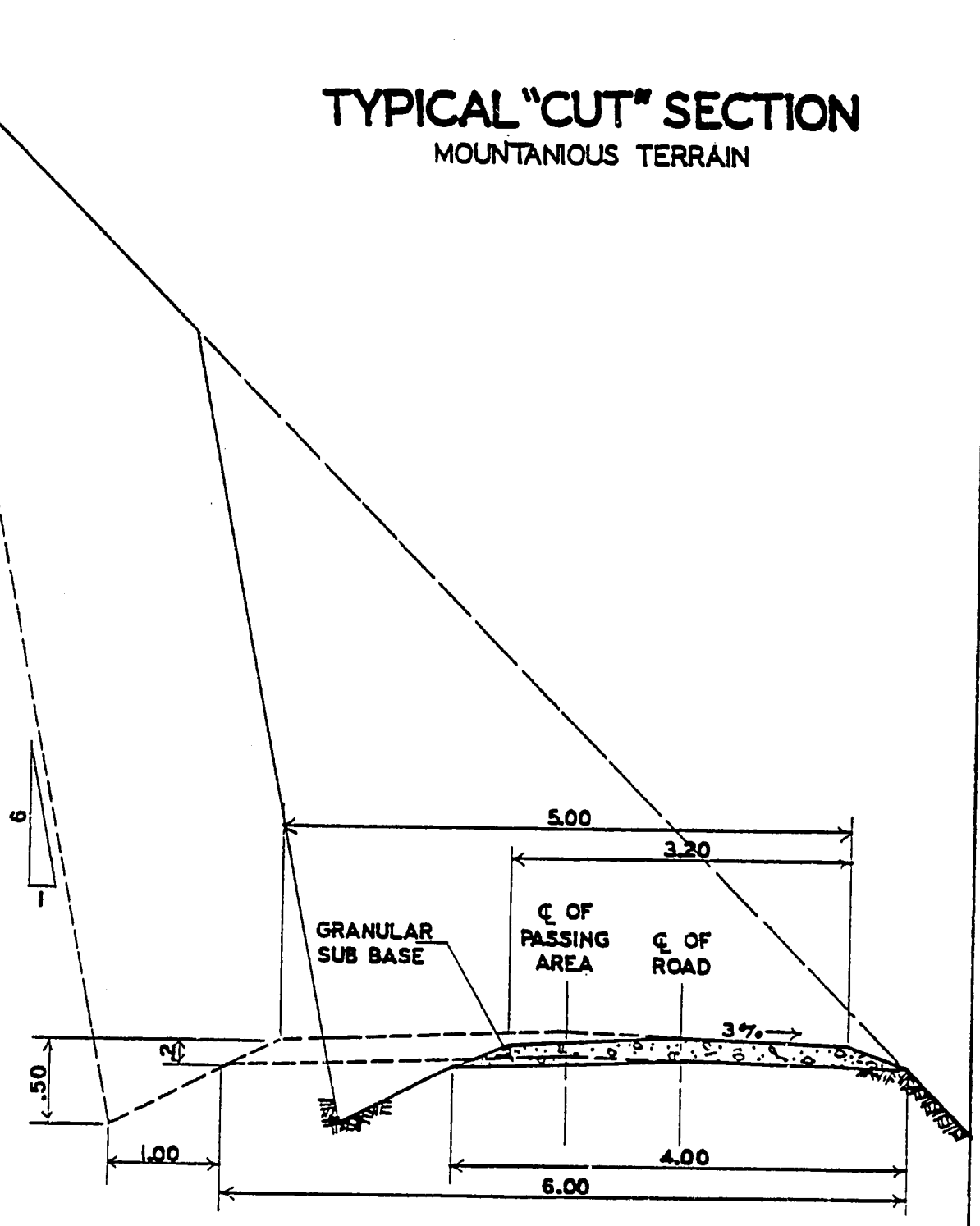
FLAT TERRAIN

CLAYEY SOIL WITH ORGANIC MATERIAL,
HIGH PLASTICITY AND MOISTURE CONTENT

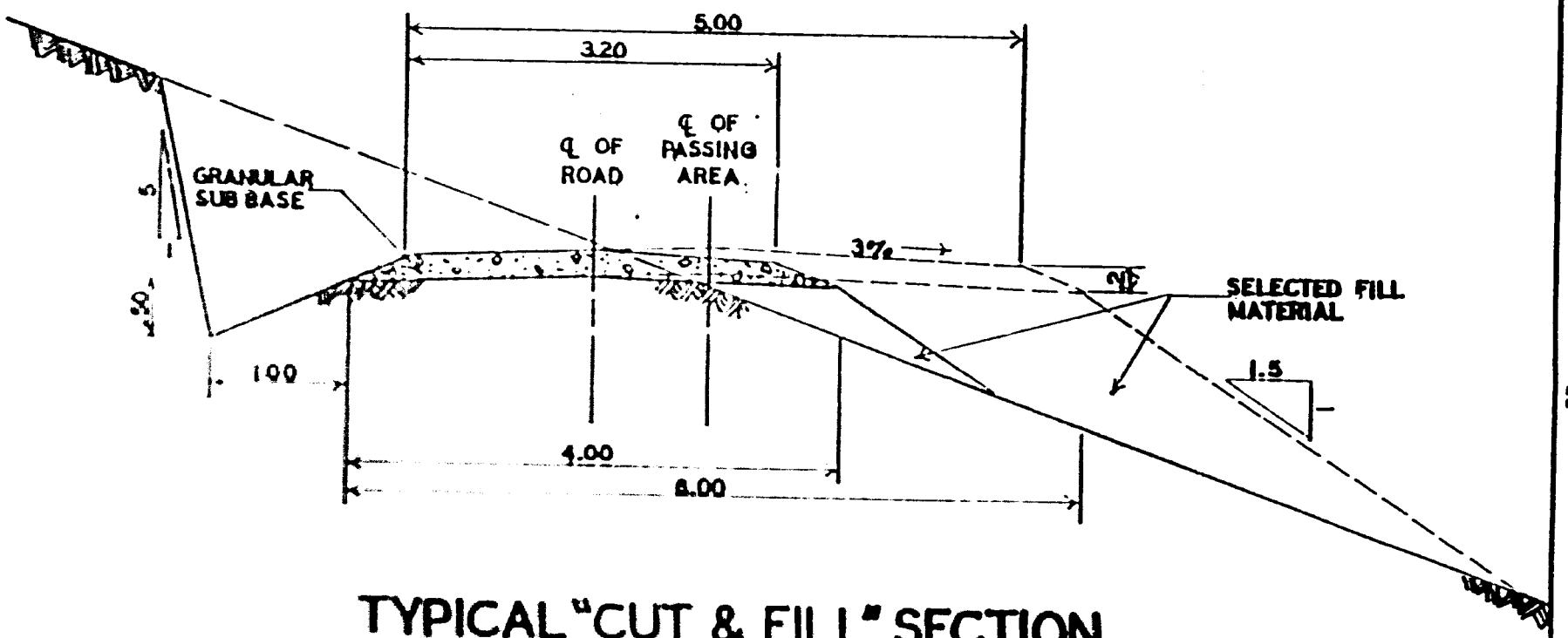
USAID/PERU	
SCALE—1:50	9 AUG. 1977
FRED E. COOPER IV	NO. 1/3

TYPICAL "CUT" SECTION

MOUNTANIOUS TERRAIN



USAID/PERU	
SCALE—1:50	9 AUG 1977
FRED E. COOPER IV	NO.3/3



TYPICAL "CUT & FILL" SECTION

ROLLING TERRAIN

USAID/PERU	
SCALE — 1:50	9 AUG. 1977
FRED L. COOPER III	NO.2/3

B. BUILDING CONSTRUCTION PROGRAM

1. GENERAL DESCRIPTION

The Project will finance the construction and equipping of up to five grain collection centers and five farm machinery service centers.

1.1. COLLECTION CENTERS

The Collection Centers or warehouses will be constructed and operated by EPSA. The main facility will be located in Tarapoto (storage capacity 6,500 M.Tons.) and the others will be in Bellavista (1,000 M.T.), Juanjui (1,000 M.T.), Picota (500 M.T.) and San Jose de Sisa (500 M.T.).

The warehouses will be simple structures appropriate for tropical jungle areas. The roof will consist of gauge 24 corrugated metal sheets supported by steel frames made of A-36 structural profiles mainly of L and U shapes. The floor will be constructed of reinforced concrete with drainage provisions.

For reasons of economy, the walls will be made of concrete blocks instead of the corrugated metal sheets that had been originally planned.

The total investment in the warehouses is estimated at $265,250 broken down as follows:

Location	Capacity in Metric Tons	Estimated Costs* S/.	S
Tarapoto	6,500	12,300,000	153,750
Bellavista	1,000	2,850,000	35,625
Juanjui	1,000	2,850,000	35,625
Picota	500	1,610,000	20,125
San José de Sisa	500	1,610,000	20,125
	9,500 M.T.	S/.21,220,000	$265,250

A detailed cost summary along with preliminary design for each type of building is presented in Table 1.

*Costs based on recent experience in construction of identical facilities in similiar areas of the country and site adapted.

1.2. MACHINERY SERVICE CENTERS

These centers will be constructed and run by SENAMA. The main one will be located in Tarapoto and the other four in the localities of Bellavista, Juanjui, Picota and San José de Sisa.

The main center will have a total area of 100 meters by 50 meters. Twenty-five percent of the area will be roofed with asbesto-cement corrugated plates supported by steel poles, fifteen percent by a reinforced concrete roof slab and the rest will be open. The other four centers will be somewhat smaller but keeping more or less the same proportions.

The machinery Service Centers will be provided with all basic facilities such as electricity, water, sewage, drainage, compressed air, fire hydrants and gasoline and diesel filling stations. Thus, they will be able to handle not only maintenance of farm and road machinery but also to provide repair overhaul service as needed. In view of the isolated location of the centers, it will be important to provide them with a good stock of spare parts as well as with qualified mechanics to take care of all the maintenance work and common repairs.

The total investment in the machinery service centers is estimated in $579,500 broken down as follows:

Location	Estimated Cost * S/.	$
Tarapoto	12,200,000	152,500
Bellavista	8,540,000	106,750
Juanjui	8,540,000	106,750
Picota	8,540,000	106,750
San José de Sisa	8,540,000	106,750
Total	S/. 46,360,000	$ 579,500

A detailed cost breakdown along with a sample design for each type of building is presented in Table 2.
* Costs based on recent experience in construction of identical facilities in similar areas of the country and site adapted.

2. PLAN FOR PROJECT EXECUTION

2.1. DESIGN AND PREPARATION OF CONTRACT DOCUMENTS

The implementing agencies have already developed preliminary plans for the collection and service centers. The implementing agencies (EPSA/SENAMA) have the experience and capacity to prepare final plans, specifications and cost estimates for the construction of the buildings and for the procurement of the equipment. It is estimated that all the final documents will be completed approximately 120 days after signing the loan agreement.

2.2. CONSTRUCTION ARRANGEMENTS

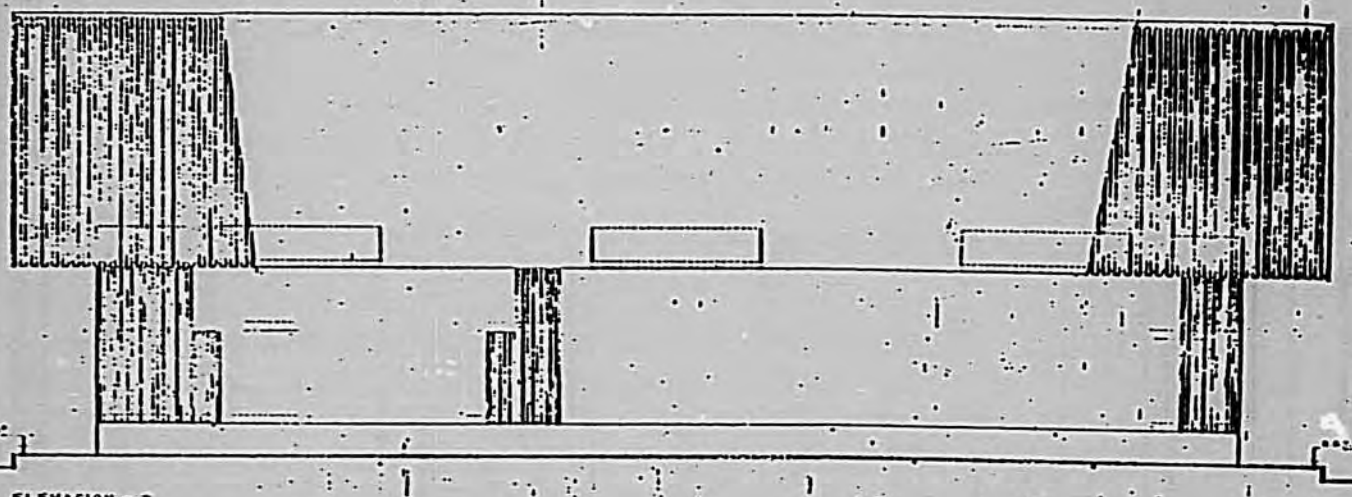
Construction of the service and machinery centers will be done by local private contractors selected by competitive bidding. It is anticipated that the construction work for each building will be completed within a period of 8 to 10 months.

2.3. CONSTRUCTION INSPECTION

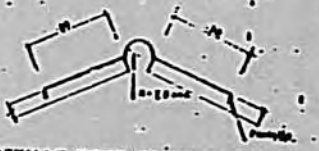
The implementing agencies will be responsible for the inspection of all the construction work through their own central or regional inspectors with experience in building construction in the jungle area.

500 M.T. WAREHOUSE

ELEVATIONS



ELEVACION - 2

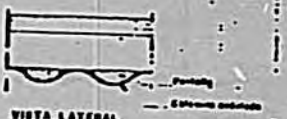


DETALLE TIPICO DE CUMBRERA

1.- Columna placa, gauge 24

2.- Debe cogen la pr desde de los laterales y terminan con un pendolo que se pégan al ondulado de la columna de pes.

3.- Tornillos más cumbreras o pá cm.



VISTA LATERAL

ESPECIFICACIONES:

1°- SE UTILIZARA CALAMINAS ONDULADAS DE ZINC, CALIBRE 26 (0.60mm)

2°- ACERO ESTRUCTURAL, TIPO A-36

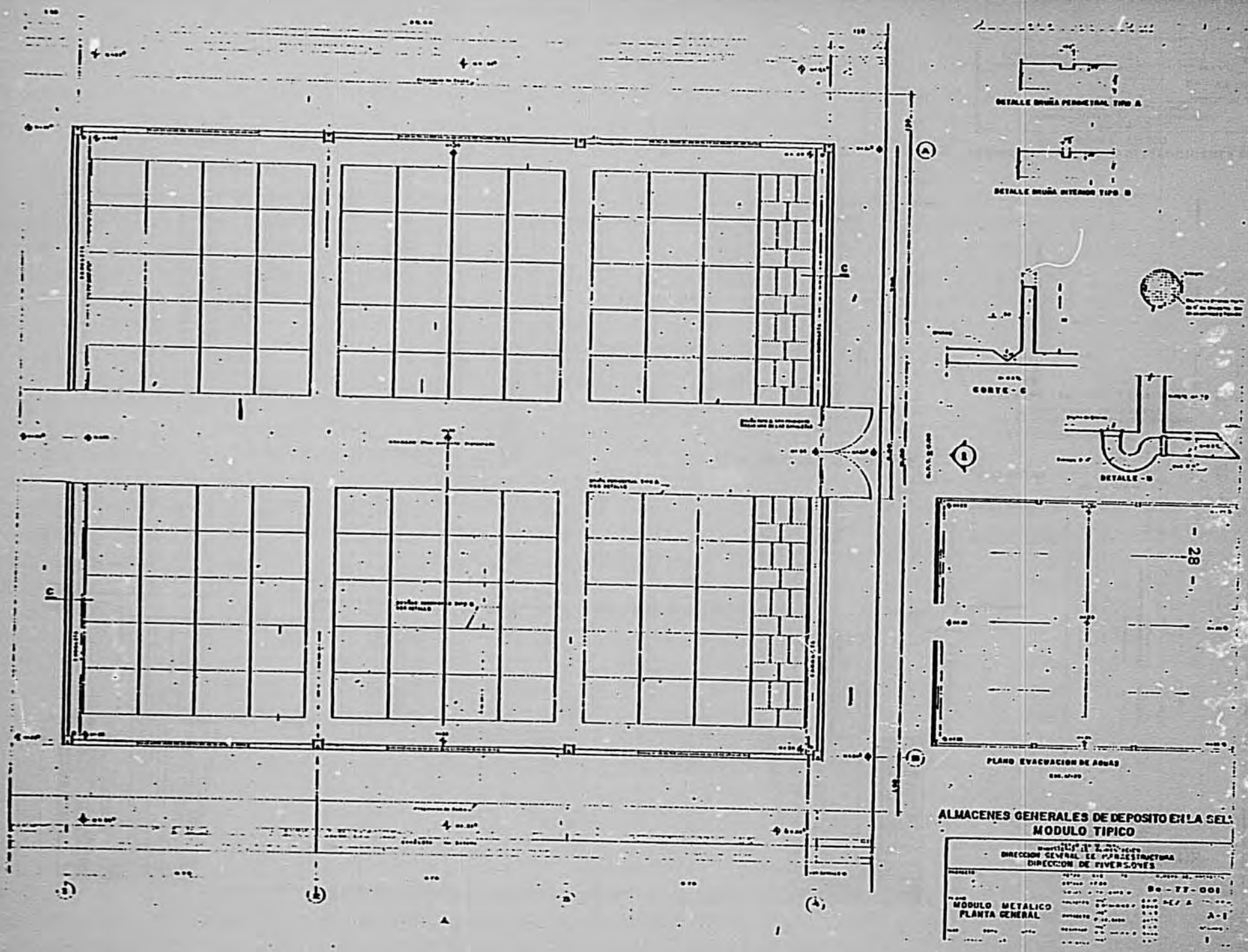
ELEVACION - 1

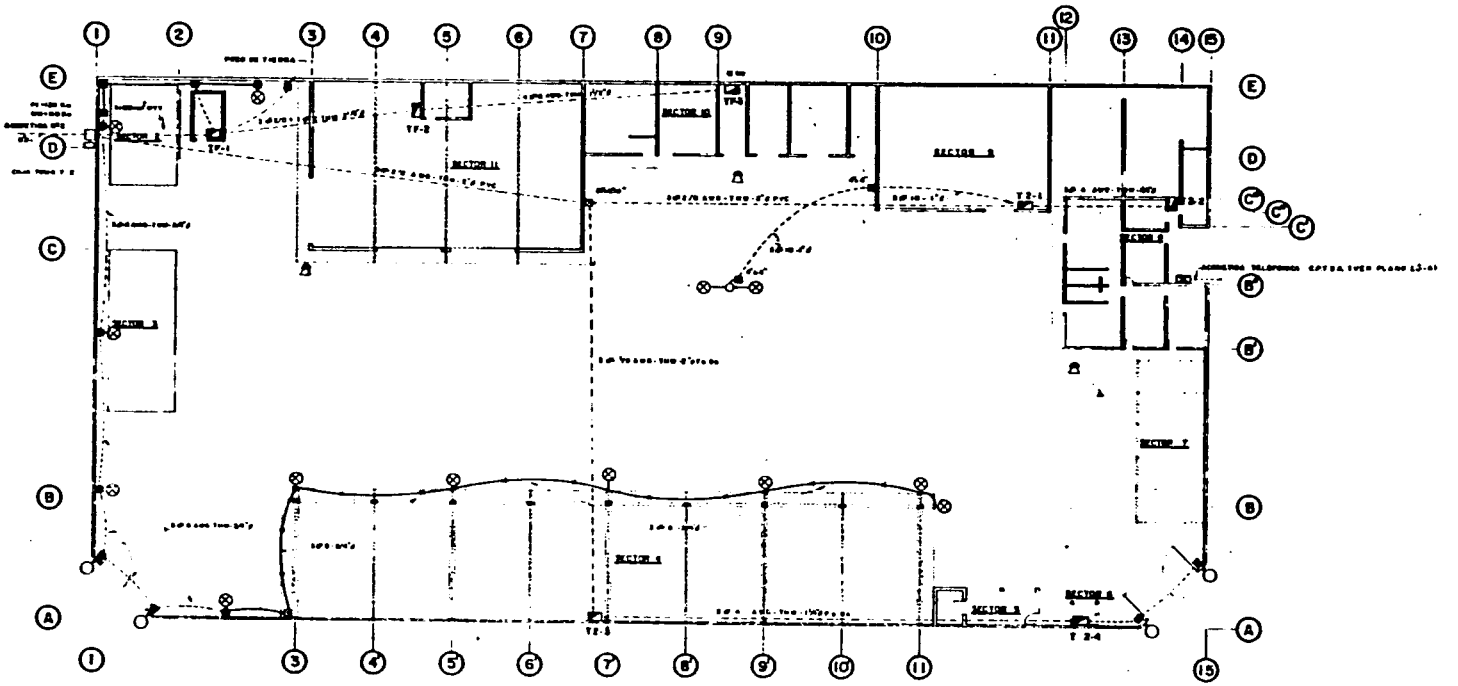
ALMACENES GENERALES DE DEPOSITO EN LA SE

MODULO TIPICO

DIRECCION GENERAL DE INFRAESTRUCTURA
DIRECCION DE INVERSIONES

	86-77-001
MODULO METALICO ELEVACIONES	REV. A
	A-2


DETALLE BRUÑA PERIMETRAL TIPO A
DETALLE BRUÑA INTERIOR TIPO B
CORTE - C
DETALLE - B
PLANO EVACUACION DE AGUAS
ALMACENES GENERALES DE DEPOSITO EN LA SEL
MODULO TIPICO
DIRECCION GENERAL DE INFRAESTRUCTURA
DIRECCION DE INVERSIONES
MODULO METALICO
PLANTA GENERAL
Sa - 77 - 001
A-1



MANZANA Nº 1

MACHINE SERVICE CENTER

INSTALACIONES ELECTRICAS
ALUMBRADO Y FUERZA MOTRIZ

EPSA - COMPLEJO PIURA

PROYECTO DE ELECTRICIDAD		REFERENCIA MANZANA Nº 1	Nº DE PLANO
		SEMAMA	IE-3
	ESCALA	FECHA	NOMBRE

1.b CONSTRUCTION COSTS

COLLECTION CENTER OF 6,500 MT

I. Plans and Administration		
A. Direct Costs		
1. Studies and Designs	S/. 1,000.000	$12,500
2. Equipment and Materials	100,000	1,250
3. Per Diem	100,000	1,250
B. Indirect Costs		
Office Expenses, Insurance and Administration	500,000	6,250
II. Execution		
A. Direct Costs		
1. Construction Contract	6,500,000	81,250
2. Supply Contract	1,500,000	18,750
B. Indirect Costs		
Office Expenses, Insurance and Supervision	1,000,000	12,500
III. Contingencies (10% of Construction & Supply)	800,000	10,000
IV. Inflation (10% of Construction & Supply)	800,000	10,000
TOTAL:	12,300,000	153,750

1.b CONSTRUCTION COSTS

COLLECTION CENTER OF 1,000 M.T.

I.	Plans and Administration		
	A. Direct Costs		
	1. Studies and Designs	S/. 500,000	$6,250
	2. Equipment and Materials	50,000	625
	3. Travel & Per Diem	50,000	625
	B. Indirect Costs		
	Office Expenses, Insurance, etc.	50,000	625
II.	Execution		
	A. Direct Costs		
	1. Construction Contract	1,000,000	12,500
	2. Supply Contracts	500,000	6,250
	B. Indirect Costs		
	Office expenses, Insurance, Supervision	400,000	5,000
III.	Contingencies (10% of Construction & Supply)	150,000	1,875
IV.	Inflation (10% of Construction & Supply)	150,000	1,875
	TOTAL	S/. 2,850.000	$35,625

1.b. CONSTRUCTION COSTS

COLLECTION CENTER OF 500 M.T.

I. Plans and Administration		
A. Direct Costs		
1. Studies and Designs	S/. 400,000	$5,000
2. Equipment and Materials	35,000	438
3. Travel and Per Diem	35,000	437
B. Indirect Costs		
Office Expenses, Insurance and Administration	40,000	500
II. Execution		
A. Direct Costs		
1. Construction Contract	500,000	6,250
2. Supply Contract	250,000	3,125
B. Indirect Costs		
Office Expenses, Insurance and Supervision	200,000	2,500
III. Contingencies (10% of Construction & Supply)	75,000	938
IV. Inflation (10% of Construction & Supply)	75,000	937
TOTAL:	1,610,000	20,125

1.c. CONSTRUCTION COSTS (SENAMA)

PRINCIPAL MACHINERY SERVICE CENTER

TARAPOTO

		S/.	US$
I.	Plans and Administration		
	A. Direct Costs		
	1. Studies and Designs	200,000	2,500
	2. Equipment and Materials	-	-
	3. Travel and Per Diem	50,000	625
	B. Indirect Costs		
	Office Expenses, Insurance, etc.	100,000	1,250
II.	Execution		
	A. Direct Costs		
	1. Construction Contract	3,000,000	37,500
	2. Supply Contracts	6,500.000	81,250
	B. Indirect Costs		
	Office Expenses, Insurance, Supervision	450,000	5,625
III.	Contingencies (10% of construction and supply)	950,000	11,875
IV.	Inflation (10% of construction and supply)	950,000	11,875
	TOTAL:	12,200,000	152,500

CONSTRUCTION COSTS (SENAMA)

MACHINERY SERVICE CENTER

		S/.	US$
I.	Plans and Administration		
	A. Direct Costs		
	1. Studies and Designs	140,000	1,750
	2. Equipment and Materials	-	-
	3. Travel and Per Diem	35,000	438
	B. Indirect Costs		
	Office Expenses, Insurance, etc.	70,000	875
II.	Execution		
	A. Direct Costs		
	1. Construction Contract	2,100,000	26,250
	2. Supply Contracts	4,550,000	56,875
	B. Indirect Costs		
	Office Expenses, Insurance & Supervicion	315,000	3,938
III.	Contingencies (10% of construction and supply)	665,000	8,312
IV.	Inflation (10% of construction and supply)	665,000	8,313
	TOTAL:	8'540,000	106,751

4 Centers: $427,004

ANNEX B
Exhibit 2

AGRONOMIC REPORT ON PRODUCTION POTENTIAL

Huallaga Central - Bajo Mayo

USAID/PERU
May 1977

Soil Summary:

The following is a brief summary of the soils of the zones Huallaga Central and Bajo Mayo. Class I, II and III (according to land use capability) are considered because area development is dependent upon these three classes primarily.

Class I soils - 12,367 ha.

Classification for Slope	Series	% Ca Exchange	Ph	Surface % Organic
1	Huallaga	19.4	7.3	3.4
1	Cumbaza	7.1	7.0	1.79

Class II soils - 49,603 ha.

1	IIi Huallaga inundable			
1	IIs Picoto	39	7.0	5.03
1	IIs Pampas	26.4	7.5	4.68

Class III soils - 48,715 ha.

	IIIs La Unión	6.1	7.1	1.9
1	Porvenir	----------?----------		
and	Tarapoto Amarillo	1.2	4.6 - 5.6	3.24
1C	Pampas	26.4	7.5	3.3 - 4.7
	Picata	39	7	5.03
2	IIIes Moparo	18	7.8	2.5
1 & 1C	IIIsw Saposoa	5.6	4.7 - 5.5	2.27

Slope Classification

1 0 - 5% slope
1C " with breaks
2 5 - 20% slope

Limitations

i - flood danger
S - texture, structure, depth
E - risk of erosion
W - drainage and permiability

There are 110,685 ha. combined in Class I, II and III soils. They are almost entirely located along the river valleys. With the exception of a part of Class III soils which have a slope of 5 to 20%, all are with slopes of 0 to 5%. They are mostly calcarious soils and the top 15 cm.

has an organic content of about 2 to 5%. It was observed that corn grown as the 5th. consecutive crop from the soils virgin state exhibited no nitrogen deficiency symptoms. This is attributed to the high soil surface organic content.

Weeds

The common practice of farming land in the Huallaga area, is to burn the natural vegetation from a desired holding, plant, and wait for harvest. Little is performed between planting and harvesting for weed, disease or insect control. Apparently this practice is successful on an annual basis to the small farmer through the third to fifth cropping cycle. At this point the weed problem forces the farmer to move to a new virgin area and repeat the same process. The organization Cooperacion Peru-Holanda in Tarapoto (Coperholta) has conducted some weed studies on various small farms in cooperation with the farmer. Their studies included week control by hand labor, pre-emergence chemical control and by a combination of both. They found that the most economic control of weeds was by the combination method.

This combination weed control method has some distinct advantages in view of the fact that there is rain during every month of the year which hinders weed control in crops. Some considerations are listed:

1. Repeated weed research by various researchers has shown that weeds allowed to grow with the crop for the first 30 days after planting can reduce the yield of the crop up to 60%, and if the weeds are severe enough can cause the abandonment of the crop.

2. Rain during this first 30 days (the most critical crop growth period) can cause delays in weeding by hand or by machine.

3. Rain usually increases the effectiveness of pre-emergence chemical weed control.

4. The application of the pre-emergence chemicals at 1/2 recommended rate will kill some weeds and stunt or retard the growth of other susceptible weeds. This allows the advantage to the crop and extends the period of time for weeds to be removed for minimum adverse effect on crop yields.

5. Mark H. Versteeg, Extension Agronomist, COPERHOLTA, found in his work that the optimum ...tweeding period for beans and corn lies between the 15th. and 20th. days after planting. This period was enlarged by about two weeks when 1/2 rate of pre-emergence herbicide was applied.

6. The 1/2 rate of pre-emergence herbicide also reduced phytotoxicity to a minimum.

Crops: Most crops that can be grown in the tropics can be grown in this fertile area. The most limiting factor at this time is market availability. Some of the crops that are now being grown are shown below with average and maximum yields recorded by COPERNOLTA on model farms.

Crop	Highest yield	Ave. Yield (Kg)
Corn	3,000	1,632
Yuca	40,000	17,400
Rice	3,500	1,644
Beans	1,200	683
Sugar Cane	45,000	29,857
Sorghum	2,075	-

The remainder of this report will concentrate on agronomic practices which should be employed in the project area, assuming second stage mechanical clearing and soil conditioning, i.e., removal of roots, rocks and other hazards or impediments to the use of conventional tractors and assuming mechanical preparation of soil for planting once a year.

It must be stated clearly that the combination of rainfall and evapotranspiration rates indicates that there is insufficient water available for maximum plant growth during most of the year. This means that crop yields, particularly oil seeds and grains, will achieve less than the full genetic potential of the plant. Nevertheless, yields are generally profitable except in drought conditions which can be expected once in every five years. Even then, some crops have demonstrated drought resistance and produced high yields.

Certain features of the slash and burn system of agriculture have made it the dominant one in the area. Cutting and burning is an inexpensive means of clearing known to all farmers. The practice is superb for weed control and it creates highly fertile conditions for several crop cycles. Where land is abundant and capital resources scarce it is virtually the only feasible system.

Slash and burn agriculture has its limitations, however, it demands extensive use of land that should be used intensively because it forces abandonment of land, giving it up to renewed jungle growth. The practice does not permit the employment of mechanical means of soil preparation, either animal or tractor powered, because it leaves fields cluttered with tree trunks and rocks. The machete is employed to prepare plant and weed and the struggle against weeds become more difficult with each successive crop until the farmer finally abandons the field.

At this point enters the new technology to be employed under this project. It assumes that land is, or will be abandoned only with great

difficulty because farmers will be less and less able to find land of a comparable quality elsewhere, and because attractive markets will make continuous production possible and profitable.

At the point where land is normally abandoned it should, instead, be cleared and deeply plowed. It should be possible to use bulldozers equipped with rake blades and rippers for clearing and then to use Rome plows for seed bed preparation. These actions will give the farmer a temporary advantage over the weed and jungle regrowth and will tap new reservoirs of soil fertility unavailable when only machetes are used to prepare seed beds. Each field will require the use of bulldozers in each of two successive years, but in the second year the rake blade and rippers will not be needed. The Rome plow will suffice. In the years following, conventional, wheeled tractors can be used.

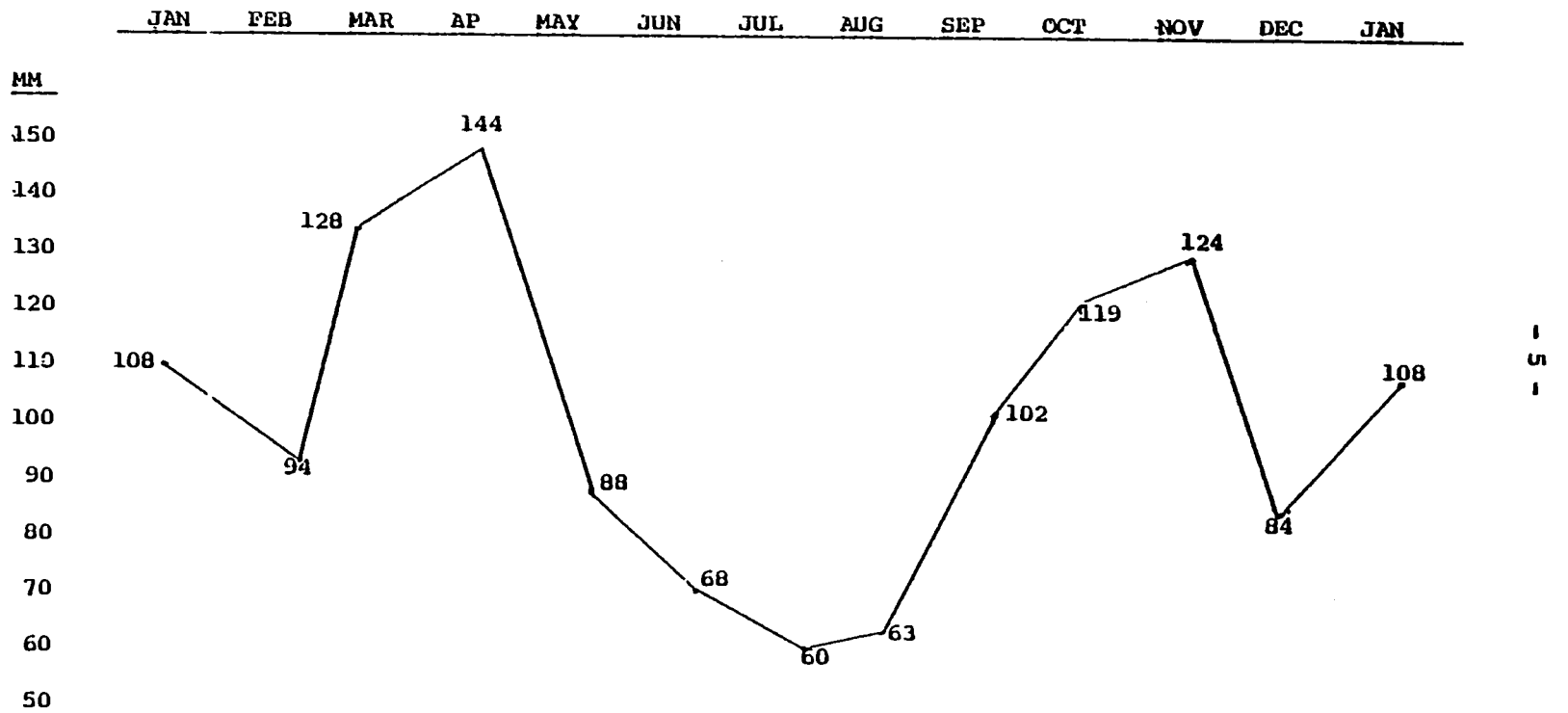
Continuous cropping should be employed to make full use of available rainfall with harvest seasons falling in the two dry seasons of the year -- May- June and December - January. These seasons should also be the periods of greatest intensity of soil preparation. At present, harvest times often fall during rainy periods, with difficult working conditions, losses and transportation problems. Harvesting in the rainy season also inhibits soil preparation and weed control needed for replanting whereas the dryer season offers optimum conditions for all operations.

The following figure graphically shows the cycle of rains and dry periods.

HUALLAGA CENTRAL/BAJO MAYO

MONTHLY AVERAGE RAINFALL

1964 - 1970



Given the high rate of evapo-transpiration, the rainfall and the periods of vegetative growth for the various crops it, appears from an agronomic standpoint, that continuous cropping systems using minimum tillage will be possible and should be recommended. The COPERHOLTA project has experience with the herbicides necessary for such a system. Three possible systems for continuous cropping under minimum tillage. rotations are listed and described below.

Dec - Jan	May - August	Interim Application	Dec - Jan
Prepare seed bed Plant soybeans Use pre-emergence herbicide	Harvest soybeans Use herbicide Plant sorghum	(24D)	Harvest sorghum Prepare seed bed Plant corn or soybeans
Prepare seed bed Plant corn Use post-emergence herbicide	Harvest corn Pre-emergence herbicide Plant soybean		Harvest soybeans Prepare seed bed Plant corn or sorghum Post-emergence
Prepare seed bed Plant sorghum Use herbicide	Harvest sorghum Apply N Fertilizer Apply herbicide	(24D)	Harvest sorghum ratoon Prepare seed bed Plant soybeans

The above are viable possibilities for the present using known technology and taking advantage of reasonably predictable wet and dry periods -- wet for maximum vegetative growth and dry for the major harvesting and planting operations. Once a year soil preparation is optimum for this system. It will share available equipment more equitably between farms because the December - January, and May - August periods are interchangeable except for length. Soil preparation by tractor can be done in either period, hence either can signal the beginning of the cycle. Eliminating plowing in the second phase will save ground moisture and the farmer's money. The systems takes advantage of the vegetative growth of the previous crop as a partial weed control for the second. Planting of the second crop can take place before the harvesting of the first. Stocks, vines and leaves of the harvested crop should remain on the ground to inhibit weed growth and evapo-transpiration as well as to maintain fertility by returning organic matter to the soil.

There are about 100,000 hectares in the Project area that could be cropped continuously in the foregoing manner, without fallow periods. Of course, the crop choice is not limited to corn, sorghum and soybeans

but could include other beans and oilseeds, cotton, tobacco and bananas, depending upon the distance to markets and the skill of farmers.

A case can be made for concentrating productive resources on a relatively small number of commercial crops on the higher quality soils, taking into account the foregoing factors. Close to major population centers vegetables and bananas would appear most appropriate. In outlying areas the crops for which EPSA has guaranteed prices appear to offer the best mix. These are corn, soy, sorghum and rice. Not enough is known about sunflowers and sesame to recommend their adoption. At the present time it appears that sunflowers could become a weed problem that interferes with the production of other crops.

There is ample room for the development of coffee and cacao plantations, citrus orchards and banana plantations on less level land. Rainfall is more than adequate at the higher elevations. The nursery at Tarapoto should actively promote distribution of trees and provide technology transfer to farmers to establish tree crops where land or steeper slopes might otherwise be abandoned. Consideration should be given to the ENATA activity of promoting the planting of coconut palms around the margins of fields. Coconut oil and meal are valuable products that can provide additional income on little investment. Moreover the palms would be useful for establishing boundaries, fencing in land and providing fuel. Copra processing is a known technology and the COPERHOLTA oil processing plant should be designed to include it.

For better or worse, predictions on productivity in the Project area do not hinge upon agronomic factors alone. Availability of new technologies, mechanization, rationalization of continuous cropping patterns, proximity and reliability of markets, credit systems and far from last, the rate at which the farmers can, or will, take advantage of these developments, all influence what the Project area will actually produce.

At a level of 100% efficiency, with partial mechanization in soil preparation and harvesting, appropriately timed planting and harvesting, the agronomic potential of the Project area would be truly impressive. There should be two full crops per year on Classes I, II and III soils which can be reached easily by existing roads, roads to be built or by navigable river. Yields on each class, by crop, should eventually reach the following levels:

YIELD (KG/HA.)

CROP	SOILD CLASS I	II	III
Rice	5000	2000	1500
Corn	3500	3000	2500
Soybeans	3000	2800	2000
Sorghum	4000	4000	3200
Beans	2000	1900	1500

Discounting inaccessible Class I soils there are about 12,000 ha. total in this category. Some are subject to flooding. This, however, will not damage the rice crop. On such lands two crops of rice will still be feasible.

There are 48,606 hectares of Class II land. Of this it is estimated that 48,000 has. will become accessible during the Project or are already accessible.

There are 48,000 has. of Class III, of which 30,000 will be affected by the Project.

At the present time it is estimated by COPERHOLTA that there are 43,939 ha. of land producing crops in the Project area according to the following breakdown:

CROPS	HECTARES	ESTIMATED DOLLAR VALUE OF CROP*	CURRENT AVERAGE YIELDS/HA.
Banana	16718	10,030	1500 Stocks
Corn	10770	1,117	1250 Kg.
Beans	1163	247	700 "
Yuca	3254	1,373	15000 "
Rice	2693	672	1500 "
Sugar Cane	5386	370	10000 "
Vegetables**	112	143	8000 "
Fruits***	898	670	15000 Units
Coffee	2500	6,600	2000 Kg.
Cotton	449	77	1000 "
Tobacco	1620	842	1600 "
Others**	449	472	
TOTAL	43,839	22,613	

* Yield x Price - Losses in US$000- Corn at $83/MT
** Tomatoes
*** Banana equivalent.

If all of these crops were located on Class I, II or III land, farmers of the zone would be taking advantage of less than 50% of the highly productive land available. The observation that most of the land in cultivation is planted only once a year amplies achievement of less than 25% of productive potential. This is further reduced by the observation that much of the cultivated area, particularly that producing coffee, bananas and corn is located on soils of Class IV or above. At present, then, about 20% of the potential can be said to

be achieved in any given year. This, of course, is not surprising, given the past lack of markets.

The gap between actual production and potential productivity is wide and not likely to be filled during the life of this project. The current estimated value of all crops produced in the zone is $23,474,000. Under intensive cultivation the value of crop production alone should approach or surpass $80.0 million from annual crops on the best soils, leaving aside production of coffee, cacao, bananas and fruit on less desirable soils and omitting production of cattle on roughly 100,000 hectares of land suitable for pasture.

It is worth noting the significant potential of the zone to produce deficit commodities should be mentioned. Peru imported 278,000 MT of corn in 1976. On its Class III land alone, the project could reduce the deficit by more than 50%. In 1976, 35,000 MT of raw soybeans were imported. The Project area could produce twice that much using only half of its Class III land.

B 3-1

Annex B
Exhibit 3

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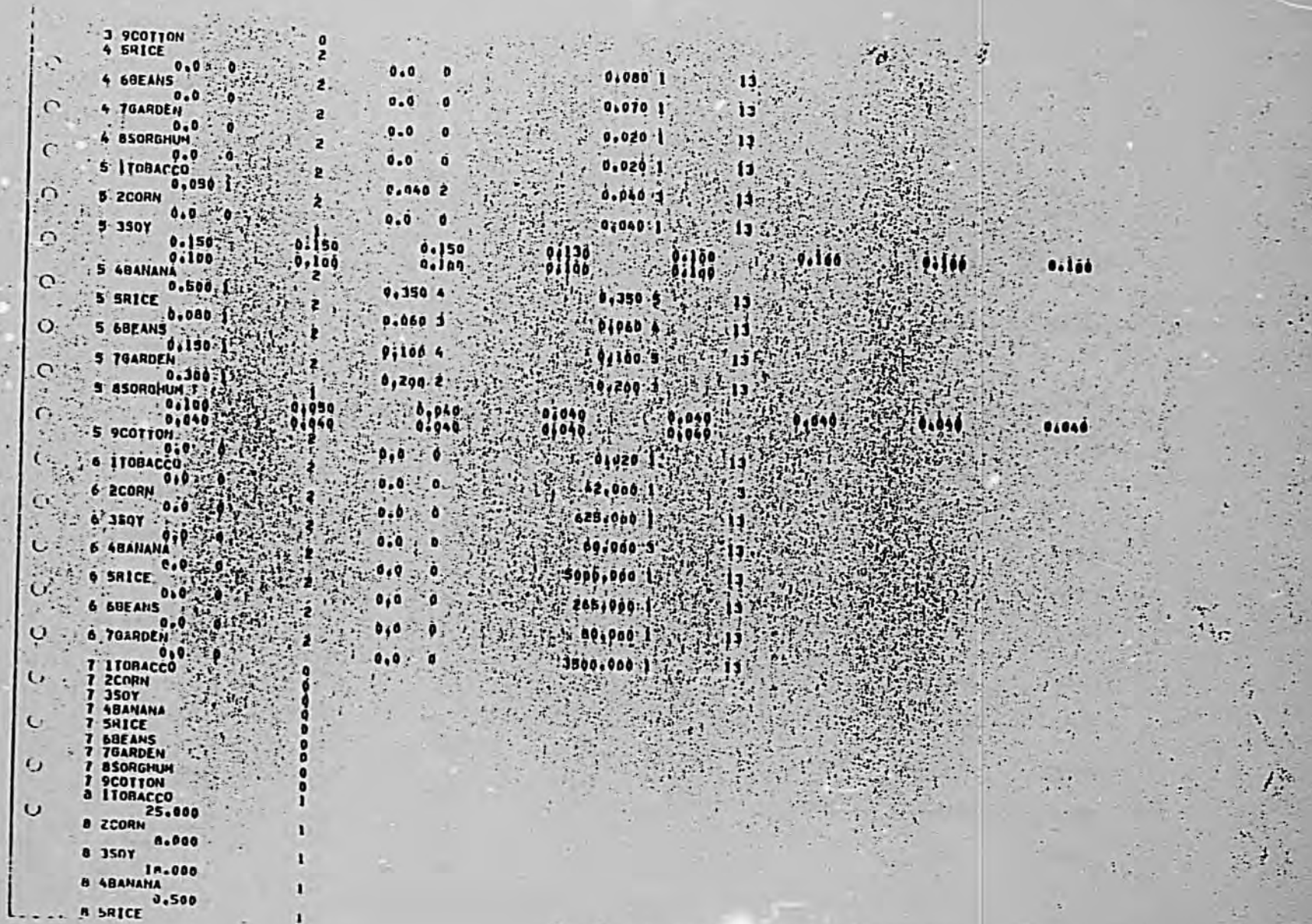
                              PERU SUB-TROPICAL LANDS (CROPS) WITH PROJECT
112077                     0.000          75.000    -115100.00013          2           1
HA          KG               33     S
 9           0           0                      0.0   0                    0.0   0                  0.0
 1  1TOBACCO                 1
          3.900          3.500           3.000          0.0            0.0           0.0          0.0           0.0
          0.0            0.0             0.0            0.0            0.0
 1  2CORN                    1
          2.400          2.850           3.000          6.000          6.000         8.000         10.000        12.000
         16.000         16.000          16.000         16.000         16.000
 1  3SOY                     1
          0.0            0.0             1.000          1.500          3.000         6.000         8.000         10.000
         12.000         16.000          16.000         16.000         16.000
 1  4BANANA                  1
          4.000          4.000           3.000          0.500          0.500         0.500         0.500         0.500
          0.500          0.500           0.500          0.500          0.500
 1  5RICE                    1
          2.200          2.200           2.200          3.300          4.400         4.400         4.400         4.400
          4.400          4.400           4.400          4.400          4.400
 1  6BEANS                   1
          0.800          0.800           0.800          0.200          0.200         0.200         0.200         0.200
          0.200          0.200           0.200          0.200          0.200
 1  7GARDEN                  1
          0.850          0.500           0.500          0.500          0.500         0.500         0.500         0.500
          0.500          0.500           0.500          0.500          0.500
 1  8SORGHUM                 1
          0.0            1.000           2.000          4.000          7.000         8.000         10.000        12.000
         14.000         16.000          16.000         16.000         16.000
 1  9COTTON                  2
          0.0     0                 0.0   0                     0.500  1              2
 2  1TOBACCO                 2
          0.0     0                 0.0   0                  1200.000  1              3
 2  2CORN                    1
       1300.000       1300.000        1450.000       1600.000       1650.000      1700.000      1800.000      2000.000
       2200.000       2200.000        2400.000       2400.000       2400.000
 2  3SOY                     1
          0.0            0.0          1200.000       1500.000       1800.000      2000.000      2300.000      2300.000
       2300.000       2300.000        2300.000       2300.000       2300.000
 2  4BANANA                  2
          0.0     0                 0.0   0                 30000.000  1             13
 2  5RICE                    1
       1200.000       1200.000        1600.000       2000.000       2200.000      2300.000      2500.000      2600.000
       2800.000       3000.000        3000.000       3000.000       3000.000
 2  6BEANS                   2
          0.0     0                 0.0   0                   800.000  1             13
 2  7GARDEN                  1
       8000.000       8000.000       10000.000      10000.000      10000.000     10000.000     10000.000     10000.000
      10000.000      10000.000       10000.000      10000.000      10000.000
 2  8SORGHUM                 1
       1800.000       1800.000        2300.000       2500.000       2700.000      2800.000      2850.000      2900.000
       3000.000       3000.000        3000.000       3000.000       3000.000
 2  9COTTON                  2
          0.0     0                 0.0   0                  1000.000  1              2
 3  1TOBACCO                 0
 3  2CORN                    0
 3  3SOY                     0
 3  4BANANA                  0
 3  5RICE                    0
 3  6BEANS                   0
 3  7GARDEN                  0
 3  8SORGHUM                 0
```


3 9COTTON 0
4 5RICE 2
0.0 0
4 6BEANS 2 0.0 0 0.080 1 13
0.0 0
4 7GARDEN 2 0.0 0 0.070 1 13
0.0 0
4 8SORGHUM 2 0.0 0 0.020 1 13
0.0 0
5 1TOBACCO 2 0.0 0 0.020 1 13
0.090 1
5 2CORN 2 0.040 2 0.040 1 13
0.0 0
5 3SOY 2 0.0 0 0.040 1 13
0.150 0.150 0.150 0.130 0.100 0.100 0.100 0.100
0.100 0.100 0.100 0.100 0.100
5 4BANANA 2
0.600 1
5 5RICE 2 0.350 4 0.350 5 13
0.080 1
5 6BEANS 2 0.060 3 0.060 4 13
0.150 1
5 7GARDEN 2 0.100 4 0.100 5 13
0.300 1
5 8SORGHUM 2 0.200 2 0.200 3 13
0.100 0.050 0.040 0.040 0.040 0.040 0.040 0.040
0.040 0.040 0.040 0.040 0.040
5 9COTTON 2
0.0 0
6 1TOBACCO 2 0.0 0 0.020 1 13
0.0 0
6 2CORN 2 0.0 0 42.000 1 13
0.0 0
6 3SOY 2 0.0 0 625.000 1 13
0.0 0
6 4BANANA 2 0.0 0 60.000 5 13
0.0 0
6 5RICE 2 0.0 0 5000.000 1 13
0.0 0
6 6BEANS 2 0.0 0 265.000 1 13
0.0 0
6 7GARDEN 2 0.0 0 80.000 1 13
0.0 0
7 1TOBACCO 0 0.0 0 3500.000 1 13
7 2CORN 0
7 3SOY 0
7 4BANANA 0
7 5RICE 0
7 6BEANS 0
7 7GARDEN 0
7 8SORGHUM 0
7 9COTTON 0
8 1TOBACCO 1
25.000
8 2CORN 1
8.000
8 3SOY 1
18.000
8 4BANANA 1
0.500
8 5RICE 1

```
        4.000
 8 6BEANS                      1
       15.000
 8 7GARDEN                     1
        5.000
 8 8SORGHUM                    1
        8.000
 8 9COTTON                     1
       12.000
 9 1FAMILY LABOR               1
   -11200.000  -5110.000   -5740.000   -4775.000   -7320.000   -8600.000  -39200.000   -8109.000
   -14480.000
 9 2CONTRACTED LABOR           0
 9 4TRACTION-ANIMAL            1
          0.0        0.0         0.0   -1004.000         0.0   -1000.000   -1000.000         0.0
          0.0
 9 5IMPLEMENTS                 1
     -156.000   -150.000    -150.000    -150.000    -300.000    -150.000    -150.000    -600.000
     -180.000
 9 6SEEDS                      1
     -404.000   -300.000   -1000.000    -760.000   -1440.000    -600.000    -950.000    -306.000
     -450.000
 9 7FERTILIZER                 1
    -1300.000  -1800.000    -440.000         0.0   -1600.000    -400.000   -1500.000   -1400.000
     -900.000
 9 8INSECTICIDE                1
    -1200.000   -800.000   -1700.000         0.0   -1504.000    -400.000   -2000.000    -800.000
    -2800.000
 9 9TRACTION-MACHINERY         1
    -2000.000  -1800.000   -1000.000         0.0   -2400.000         0.0         0.0    -750.000
    -1250.000
10 1PROD CREDIT 16%            1
        2.000      4.000       5.000       6.000       7.000       8.000       9.000         0.0
          0.0        0.0         0.0         0.0         0.0         0.0         0.0         0.0
          0.0        0.0         0.0         0.0         0.0         0.0         0.0         0.0
10 2PROD CREDIT REPAY          0
10 3INTER CREDIT 16%           0
10 5LAND CLEARING-1            1      1
  -144000.000      1.000                 1.000         5.000        0.160
10 6LAND CLEARING-2            1      1
   -90000.000      2.000                 1.000         5.000        0.160
10 7LAND CLEARING-3            1      1
  -180000.000      4.000                 1.000         5.000        0.160
10 8LAND CLEARING-4            1      1
  -126000.000      6.000                 1.000         5.000        0.160
12 1PROJECT COSTS              2
          0.0  0                  0.0   0        -150000.000  1           5
12 2LABOR                      1      END
        0.000      1.000                 0.500
```

AGENCY FOR INTERNATIONAL DEVELOPMENT
FINANCIAL ANALYSIS

DATE: 11/20/77 PROJECT# 1 — PERU SUB-TROPICAL LANDS (CROPS) WITH PROJECT — CASE#2 — PAGE 1

FARM BUDGET W/PROJECT	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
LAND USE 30 HA										
TOBACCO	3.50	3.50	3.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORN	2.40	2.85	3.00	6.00	6.00	8.00	10.00	12.00	16.00	16.00
SOY	0.0	0.0	1.00	1.50	3.00	6.00	8.00	10.00	12.00	16.00
BANANA	4.00	4.00	3.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50
RICE	2.20	2.20	2.20	3.30	4.40	4.40	4.40	4.40	4.40	4.40
BEANS	0.80	0.80	0.80	0.20	0.20	0.20	0.20	0.20	0.20	0.20
GARDEN	0.85	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
SORGHUM	0.0	1.00	2.00	4.00	7.00	8.00	10.00	12.00	16.00	16.00
COTTON	0.50	0.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL LAND IN USE	14.25	15.35	15.50	16.00	21.60	27.60	33.60	39.60	47.60	53.60
YIELD KG /HA										
TOBACCO	1200.0	1200.0	1200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORN	1300.0	1300.0	1450.0	1600.0	1650.0	1700.0	1800.0	2000.0	2200.0	2200.0
SOY	0.0	0.0	1200.0	1500.0	1800.0	2000.0	2300.0	2300.0	2300.0	2300.0
BANANA	30000.0	30000.0	30000.0	30000.0	30000.0	30000.0	30000.0	30000.0	30000.0	30000.0
RICE	1200.0	1200.0	1600.0	2000.0	2200.0	2300.0	2500.0	2600.0	2800.0	3000.0
BEANS	800.0	800.0	800.0	800.0	800.0	800.0	800.0	800.0	800.0	800.0
GARDEN	8000.0	8000.0	10000.0	10000.0	10000.0	10000.0	10000.0	10000.0	10000.0	10000.0
SORGHUM	1800.0	1800.0	2300.0	2500.0	2700.0	2800.0	2850.0	2900.0	3000.0	3000.0
COTTON	1000.0	1000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OUTPUT KG										
TOBACCO	4200.0	4200.0	3600.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORN	3120.0	3705.0	4350.0	9600.0	9900.0	13600.0	18000.0	24000.0	35200.0	35200.0
SOY	0.0	0.0	1200.0	2250.0	5400.0	12000.0	18400.0	23000.0	27600.0	36800.0
BANANA	120000.0	120000.0	90000.0	15000.0	15000.0	15000.0	15000.0	15000.0	15000.0	15000.0
RICE	2640.0	2640.0	3520.0	6600.0	9680.0	10120.0	11000.0	11440.0	12320.0	13200.0
BEANS	640.0	640.0	640.0	160.0	160.0	160.0	160.0	160.0	160.0	160.0
GARDEN	6800.0	4000.0	5000.0	5000.0	5000.0	5000.0	5000.0	5000.0	5000.0	5000.0
SORGHUM	0.0	1800.0	4600.0	10000.0	18900.0	22400.0	28500.0	34800.0	42000.0	48000.0
COTTON	500.0	500.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SEED REQUIREMENT KG										
RICE	211.2	211.2	281.6	528.0	774.4	809.6	880.0	915.2	985.6	1056.0
BEANS	44.8	44.8	44.8	11.2	11.2	11.2	11.2	11.2	11.2	11.2
GARDEN	136.0	80.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SORGHUM	0.0	36.0	92.0	200.0	378.0	448.0	570.0	696.0	840.0	960.0

AGENCY FOR INTERNATIONAL DEVELOPMENT
FINANCIAL ANALYSIS

DATE: 11/20/77 PROJECT# 1 — PERU SUB-TROPICAL LANDS (CROPS) WITH PROJECT — CASE#2 —

FARM BUDGET W/PROJECT	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
ON FARM LOSSES KG										
TOBACCO	210.0	168.0	144.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORN	124.8	148.2	174.0	384.0	396.0	544.0	720.0	960.0	1408.0	1408.0
SOY	0.0	0.0	180.0	292.5	540.0	1200.0	1840.0	2300.0	2760.0	3680.0
BANANA	60000.0	54000.0	36000.0	5250.0	5250.0	5250.0	5250.0	5250.0	5250.0	5250.0
RICE	211.2	184.8	211.2	396.0	500.8	607.2	660.0	686.4	739.2	792.0
BEANS	96.0	85.1	74.7	16.0	16.0	16.0	16.0	16.0	16.0	16.0
GARDEN	2040.0	800.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0
SORGHUM	0.0	90.0	184.0	400.0	756.0	896.0	1140.0	1392.0	1680.0	1920.0
COTTON	10.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOME CONSUMPTION KG										
TOBACCO	42.0	42.0	42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORN	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0
SOY	0.0	0.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
BANANA	5000.0	5000.0	5000.0	5000.0	5000.0	5000.0	5000.0	5000.0	5000.0	5000.0
RICE	265.0	265.0	265.0	265.0	265.0	265.0	265.0	265.0	265.0	265.0
BEANS	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
GARDEN	3500.0	3500.0	3500.0	3500.0	3500.0	3500.0	3500.0	3500.0	3500.0	3500.0
NET PRODUCTION KG										
TOBACCO	3948.0	3990.0	3414.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORN	2370.2	2931.8	3551.0	8591.0	8079.0	12431.0	16655.0	22415.0	33167.0	33167.0
SOY	0.0	0.0	960.0	1897.5	4800.0	10740.0	16500.0	20640.0	24780.0	33060.0
BANANA	55000.0	61000.0	49000.0	4750.0	4750.0	4750.0	4750.0	4750.0	4750.0	4750.0
RICE	1952.6	1979.0	2762.2	5411.0	8059.8	8438.2	9195.0	9573.4	10330.2	11087.0
BEANS	419.2	429.9	440.5	52.8	52.8	52.8	52.8	52.8	52.8	52.8
GARDEN	1124.0	-380.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0
SORGHUM	0.0	1674.0	4324.0	9400.0	17766.0	21056.0	26790.0	32712.0	39480.0	45120.0
COTTON	490.0	490.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

AGENCY FOR INTERNATIONAL DEVELOPMENT
FINANCIAL ANALYSIS

DATE: 11/20/77 PROJECT# 1 — PERU SUB-TROPICAL LANDS (CROPS) WITH PROJECT — CASE#2 —

FARM BUDGET W/PROJECT		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
SALES FARMGATE											
TOBACCO											
#S 25.00/KG	S	98700.0	99750.0	85350.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORN											
#S 8.00/KG	S	18961.6	23454.4	28408.C	60728.0	71032.0	99446.0	133240.0	179320.0	265336.0	265336.0
SOY											
#S 18.00/KG	S	0.0	0.0	17280.0	34155.0	86400.0	193320.0	297000.0	371520.0	446040.0	595080.0
BANANA											
#S 0.50/KG	S	27500.0	30500.0	24500.0	2375.0	2375.0	2375.0	2375.0	2375.0	2375.0	2375.0
RICE											
#S 8.00/KG	S	15620.0	15832.0	22097.6	43288.0	64478.3	67505.5	73559.9	76587.1	82641.5	88695.9
BEANS											
#S 15.00/KG	S	6280.0	6448.0	6608.0	792.0	792.0	792.0	792.0	792.0	792.0	792.0
GARDEN											
#S 5.00/KG	S	5620.0	-1900.0	2000.0	2000.0	2000.0	2000.0	2000.0	2000.0	2000.0	2000.0
SORGHUM											
#S 8.00/KG	S	0.0	13392.0	34592.0	75200.0	142128.0	168448.0	214320.0	261696.0	315840.0	360960.0
COTTON											
#S 12.00/KG	S	5880.0	5880.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GROSS SALES	S	178570.2	193356.3	220835.5	226537.9	369205.3	533888.4	723286.9	894290.1	1115924.0	1315238.0
EXPENDITURES											
FAMILY LABOR	S	-131775.8	-125507.3	-119578.9	-107293.4	-135100.0	-135100.0	-135100.0	-135100.0	-135100.0	-135100.0
CONTRACTED LABOR	S	0.0	0.0	0.0	0.0	-4395.4	-37015.4	-69075.4	-101135.4	-143415.4	-176735.4
TRACTION-ANIMAL	S	-5650.0	-5300.0	-4300.0	-1200.0	-1200.0	-1200.0	-1200.0	-1200.0	-1200.0	-1200.0
IMPLEMENTS	S	-2482.5	-2892.5	-3155.0	-3895.0	-5650.0	-6800.0	-8200.0	-9600.0	-11300.0	-12700.0
SEEDS	S	-9800.5	-9903.0	-10073.0	-10222.0	-14206.0	-18106.0	-21306.0	-24506.0	-28306.0	-32906.0
FERTILIZER	S	-12995.0	-14410.0	-15330.0	-19570.0	-26190.0	-31310.0	-37390.0	-43470.0	-51950.0	-56510.0
INSECTICIDE	S	-12840.0	-13300.0	-13980.0	-16670.0	-23360.0	-31040.0	-37760.0	-44480.0	-52800.0	-61440.0
TRACTION-MACHINERY	S	-15625.0	-17050.0	-17400.0	-20100.0	-24050.0	-32800.0	-39300.0	-45800.0	-55300.0	-60800.0
SUBTOTAL	S	-191168.4	-188367.4	-183814.5	-178950.0	-234151.0	-293371.0	-349331.0	-405291.0	-479371.0	-537391.0
ADD. CASH INCOME + EXP.											
PROD CREDIT 16%	S	59392.9	62860.4	64239.0	71656.9	101051.3	158271.2	214231.0	270191.0	344271.0	402291.0
PROD CREDIT REPAY	S	-68895.8	-72918.1	-74516.0	-83122.0	-117219.4	-183594.5	-248507.9	-313421.5	-399354.3	-466657.4
INTER CREDIT 16%	S	144000.0	-23040.0	30537.9	114137.9	-112425.8	-21953.4	-116651.3	-141520.7	-109356.9	-45029.3
LAND CLEARING-1	S	-144000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAND CLEARING-2	S	0.0	0.0	-90000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAND CLEARING-3	S	0.0	0.0	0.0	-180000.0	0.0	0.0	0.0	0.0	0.0	0.0
LAND CLEARING-4	S	0.0	0.0	0.0	0.0	-126000.0	0.0	0.0	0.0	0.0	0.0
ADDED INCOME + EXP	S	-9502.9	-33097.6	-61740.1	-77327.1	-128593.9	-173276.8	-150928.2	-184751.2	-164440.2	-109395.8
TOTAL FARM INCOME	S	-22101.1	-28108.8	-24721.1	-29733.2	4460.3	67240.7	223027.7	304247.9	471212.8	668451.3
PRE-PROJECT INCOME	S	-765.8	1337.3	17919.4	24918.9	30851.4	53415.8	53612.3	63454.1	81972.8	100405.2
ON FARM NET BENEFIT	S	-21335.3	-29446.1	-42631.5	-54652.1	-26391.1	13824.9	169415.4	240793.8	389240.1	568046.1
END OF YEAR CASH BAL.	S	109674.7	97390.5	94857.8	77554.2	139560.3	202340.7	358127.7	439347.9	606312.8	803551.3

AGENCY FOR INTERNATIONAL DEVELOPMENT
ECONOMIC ANALYSIS

DATE: 11/20/77 PROJECT# 1 — PERU SUB-TROPICAL LANDS (CROPS) WITH PROJECT — CASE#2 — PAGE 7

ECONOMIC BENEFIT W/PROJ		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 16
TOTAL FARM INCOME	S	-22101.1	-28100.8	-24721.1	-29739.2	4460.3	67240.7	223027.7	384247.9	471212.8	668451.3
SHADOW PRICE ADJ											
LABOR	S	65887.9	62753.7	59789.4	53646.7	67550.0	67550.0	67550.0	67550.0	67550.0	67550.0
TOTAL SDW PRICE ADJ	S	65887.9	62753.7	59789.4	53646.7	67550.0	67550.0	67550.0	67550.0	67550.0	67550.0
NET FARM BEN. W/ADJ	S	43786.8	34644.9	35068.3	23907.5	72010.3	134790.7	290577.7	371797.9	538762.8	736001.3
PROJECT COSTS	S	-150000.0	-150000.0	-150000.0	-150000.0	-150000.0	0.0	0.0	0.0	0.0	0.0
NET ECONOMIC CASHFLOW 30 HA	S	-106213.2	-115355.1	-114931.6	-126092.5	-77989.7	134790.7	290577.7	371797.9	538762.8	736001.3

AGENCY FOR INTERNATIONAL DEVELOPMENT
FINANCIAL ANALYSIS

DATE: 11/20/77 PROJECT: 1 — PERU SUB-TROPICAL LANDS (CROPS) WITH PROJECT — CASE#2 — PAGE 2

ECONOMIC BENEFIT W/PROJ	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20
[illegible] 10 HA										
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	15.00	15.00	15.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	10.00	10.00	10.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	0.50	0.50	0.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	4.40	4.40	4.40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	0.20	0.20	0.20	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	0.50	0.50	0.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	10.00	10.00	10.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	53.00	53.00	53.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible] #6 /HA										
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	2[illegible]	2[illegible]	2[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	2[illegible]	2[illegible]	2[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	3[illegible]	3[illegible]	3[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	2[illegible]	[illegible]	2[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	3[illegible]	[illegible]	3[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	2[illegible]	[illegible]	2[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible] #8										
[illegible]	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	5[illegible]	5[illegible]	5[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	5[illegible]	5[illegible]	5[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	2[illegible]	2[illegible]	2[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	3[illegible]	3[illegible]	3[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible] #9										
[illegible]	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0

AGENCY FOR INTERNATIONAL DEVELOPMENT
FINANCIAL ANALYSIS

DATE: 11/20/77 PROJECT# 1 — PERU SUB-TROPICAL LANDS (CROPS) WITH PROJECT — CASE#2 — PAGE 4

ECONOMIC BENEFIT W/PROJ	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20
ON FARM LOSSES KG										
TOBACCO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORN	1536.0	1536.0	1536.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SOY	3680.0	3680.0	3680.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BANANA	5250.0	5250.0	5250.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RICE	792.0	792.0	792.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BEANS	16.0	16.0	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GARDEN	1000.0	1000.0	1000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SORGHUM	1920.0	1920.0	1920.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COTTON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOME CONSUMPTION KG										
TOBACCO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORN	625.0	625.0	625.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SOY	60.0	60.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BANANA	5000.0	5000.0	5000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RICE	265.0	265.0	265.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BEANS	80.0	80.0	80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GARDEN	3500.0	3500.0	3500.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NET PRODUCTION KG										
TOBACCO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORN	36239.0	36239.0	36239.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SOY	33060.0	33060.0	33060.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BANANA	4750.0	4750.0	4750.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RICE	11087.0	11087.0	11087.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BEANS	52.8	52.8	52.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GARDEN	400.0	400.0	400.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SORGHUM	45120.0	45120.0	45120.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COTTON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

AGENCY FOR INTERNATIONAL DEVELOPMENT
FINANCIAL ANALYSIS

DATE: 11/20/77 PROJECT# 1 — PERU SUB-TROPICAL LANDS (CROPS) WITH PROJECT — CASE#2 —

ECONOMIC BENEFIT W/PROJ		YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20
SALES FARMGATE											
TOBACCO											
PS 25.00/KG	$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORN											
PS 8.00/KG	$	289912.0	289912.0	289912.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SOY											
PS 18.00/KG	$	595080.0	595080.0	595080.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BANANA											
PS 0.50/KG	$	2375.0	2375.0	2375.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RICE											
PS 0.00/KG	$	88695.9	88695.9	88695.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BEANS											
PS 15.00/KG	$	792.0	792.0	792.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GARDEN											
PS 5.00/KG	$	2000.0	2000.0	2000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SORGHUM											
PS 8.00/KG	$	360960.0	360960.0	360960.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COTTON											
PS 12.00/KG	$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GROSS SALES	$	1339814.0	1339814.0	1339814.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EXPENDITURES											
FAMILY LABOR	$	-135100.0	-135100.0	-135100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CONTRACTED LABOR	$	-176735.4	-176735.4	-176735.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TRACTION-ANIMAL	$	-1200.0	-1200.0	-1200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IMPLEMENTS	$	-12700.0	-12700.0	-12700.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SEEDS	$	-32906.0	-32906.0	-32906.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FERTILIZER	$	-56510.0	-56510.0	-56510.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INSECTICIDE	$	-61440.0	-61440.0	-61440.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TRACTION-MACHINERY	$	-60800.0	-60800.0	-60800.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBTOTAL	$	-537391.0	-537391.0	-537391.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADD. CASH INCOME + EXP.											
PROD CREDIT 16%	$	402291.0	402291.0	402291.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PROD CREDIT REPAY	$	-466657.4	-466657.4	-466657.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTER CREDIT 16%	$	-45029.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAND CLEARING-1	$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAND CLEARING-2	$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAND CLEARING-3	$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAND CLEARING-4	$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADDED INCOME + EXP	$	-109395.8	-64366.4	-64366.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL FARM INCOME	$	693027.1	738056.6	738056.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PRE-PROJECT INCOME	$	107552.7	107552.7	107552.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ON FARM NET BENEFIT	$	585474.6	630503.9	630503.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
END OF YEAR CASH BAL.	$	428127.1	473156.6	473156.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0

AGENCY FOR INTERNATIONAL DEVELOPMENT
ECONOMIC ANALYSIS

DATE: 11/20/77 PROJECT# 1 PERU SUB-TROPICAL LANDS (CROPS) WITH PROJECT CASE#2 PAGE 8

ECONOMIC BENEFIT W/PROJ		YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20
TOTAL FARM INCOME	S	693027.3	738056.6	738056.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SHADOW PRICE ADJ											
LABOR	S	67550.0	67550.0	67550.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL SDW PRICE ADJ	S	67550.0	67550.0	67550.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NET FARM BEN. W/ADJ	S	760577.3	805606.6	805606.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PROJECT COSTS	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NET ECONOMIC CASHFLOW 30 MA	S	760577.3	805606.6	805606.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0

AGENCY FOR INTERNATIONAL DEVELOPMENT
PRESENT WORTH
&
RATE OF RETURN ANALYSIS

PROJECT # 1

PERU SUB-TROPICAL LANDS (CROPS) WITH PROJECT

CASE #2

ON FARM NET BENEFIT

THE RATE OF RETURN IS OVER 50%

AGENCY FOR INTERNATIONAL DEVELOPMENT
PRESENT WORTH
&
RATE OF RETURN ANALYSIS

PROJECT # 1

PERU SIM-TROPICAL LANDS (CROPS) WITH PROJECT

CASE #2

END OF YEAR CASH BALANCE

THE RATE OF RETURN IS OVER 50%

AGENCY FOR INTERNATIONAL DEVELOPMENT
PRESENT WORTH
&
RATE OF RETURN ANALYSIS

PROJECT # 1

PERU SUB-TROPICAL LANDS (CROPS) WITH PROJECT

CASE #2

NET ECONOMIC CASHFLOW

YEAR	NET CASH FLOW	DISCOUNT RATE 0.30	DISCOUNTED CASH FLOW	DISCOUNT RATE 0.35	DISCOUNTED CASH FLOW
1.	-106213.	0.7692	-81702.	0.7407	-78676.
2.	-115355.	0.5917	-68258.	0.5487	-63295.
3.	-114932.	0.4552	-52313.	0.4064	-46713.
4.	-126093.	0.3501	-44149.	0.3011	-37963.
5.	-77990.	0.2693	-21005.	0.2230	-17393.
6.	134721.	0.2072	27926.	0.1652	22267.
7.	290578.	0.1594	46309.	0.1224	35557.
8.	371798.	0.1226	45579.	0.0906	33701.
9.	538763.	0.0943	50805.	0.0671	36174.
10.	736001.	0.0725	53389.	0.0497	36605.
11.	760577.	0.0558	42439.	0.0368	28020.
12.	805607.	0.0429	34579.	0.0273	21985.
13.	805607.	0.0330	26599.	0.0202	16285.
		PRESENT WORTH =	60197.		-13446.
		RATE OF RETURN =	34.09%		

PERU SUB-TROPICAL LANDS (LIVESTOCK) WITH PROJECT

112077 0.000 75.000 -45150.00013 2 2

HA KG	30 S							
2 0	0							
1 1DAIRY CATTLE	1	0.0 0		0.0 0		0.0		
8.000	9.000	12.000	15.000	15.000	15.000	15.000	15.000	
15.000	15.000	15.000	15.000	15.000				
1 2BEEF CATTLE	1							
8.000	8.000	12.000	15.000	15.000	15.000	15.000	15.000	
15.000	15.000	15.000	15.000	15.000				
2 1MILK	1							
1600.000	1600.000	1600.000	1800.000	1800.000	2000.000	2500.000	2500.000	
3000.000	3500.000	3500.000	3500.000	3500.000				
2 2MEAT	1							
96.000	96.000	96.000	96.000	100.000	100.000	150.000	170.000	
190.000	205.000	205.000	205.000	205.000				
3 1MILK	0							
3 2MEAT	0							
5 1MILK	1							
0.050	0.050	0.050	0.050	0.030	0.030	0.030	0.030	
0.030	0.030	0.030	0.030	0.030				
5 2MEAT	1							
0.100	0.100	0.100	0.100	0.060	0.060	0.060	0.060	
0.060	0.060	0.060	0.060	0.060				
6 1MILK	2							
0.0 0		0.0 0		385.000 1	13			
6 2MEAT	2							
0.0 0		0.0 0		32.000 1	13			
7 1MILK	0							
7 2MEAT	0							
8 1MILK	1							
10.000								
8 2MEAT	1							
80.000								
9 1FAMILY LABOR	1							
-2000.000	-1200.000							
9 2HIRED LABOR	0							
9 4FENCING/MILK PARLOUR	1							
-400.000	-400.000							
9 5IMPLEMENTS	1							
-100.000	-100.000							
9 6SEED PURCHASE	1							
-50.000	-50.000							
9 7VET MEDICINE	1							
-1200.000	-1200.000							
9 8MACHINERY	1							
-350.000	-350.000							
9 9BALANCED FEED	1							
-2500.000	-2000.000							
10 1PRODUCTION CREDIT	1							
4.000	5.000	6.000	7.000	8.000	9.000	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10 2PROD CREDIT REPAY	0							
10 3INTER CREDIT 16%	0							
10 5LAND CLEARANCE-1	1 1							
-10000.000	1.000	1.000	5.000	0.160				
10 6LAND CLEARANCE-2	1 1							
-80000.000	2.000	1.000	5.000	0.160				
10 7LAND CLEARANCE-1	1 1							
-60000.000	3.000	1.000	5.000	0.160				

```
10 LIVESTOCK PURCHASE    1    1
   -120000.000          2.000          1.000          5.000          0.160
10 OFF FARM LABOR        1
      2297.000          1071.000          0.0          0.0          0.0          0.0          0.0          0.0
         0.0               0.0            0.0          0.0          0.0
12 1PROJECT & ADMIN COST 2
         0.0    0                  0.0    0                -150000.000 1          5
12 2FAMILY LABOR ADJ.    1        END
         9.000             1.000          0.500
```

AGENCY FOR INTERNATIONAL DEVELOPMENT
FINANCIAL ANALYSIS

DATE: 11/20/17 PROJECT# 2 — PERU SUB-TROPICAL LANDS (LIVESTOCK) WITH PROJECT — CASE#2 — PAGE 1

FARM BUDGET W/PROJECT		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
LAND USE 30 HA											
DAIRY CATTLE		8.00	9.00	12.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
BEEF CATTLE		8.00	8.00	12.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
TOTAL LAND IN USE		16.00	17.00	24.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
YIELD KG /HA											
MILK		1600.0	1600.0	1600.0	1800.0	1800.0	2000.0	2500.0	2500.0	3000.0	3500.0
MEAT		96.0	96.0	96.0	96.0	100.0	100.0	150.0	170.0	190.0	205.0
OUTPUT KG											
MILK		12800.0	14400.0	19200.0	27000.0	27000.0	30000.0	37500.0	37500.0	45000.0	52500.0
MEAT		768.0	768.0	1152.0	1440.0	1500.0	1500.0	2250.0	2550.0	2850.0	3075.0
ON FARM LOSSES KG											
MILK		640.0	720.0	960.0	1350.0	810.0	900.0	1125.0	1125.0	1350.0	1575.0
MEAT		76.8	76.8	115.2	144.0	90.0	90.0	135.0	153.0	171.0	184.5
HOME CONSUMPTION KG											
MILK		385.0	385.0	385.0	385.0	385.0	385.0	385.0	385.0	385.0	385.0
MEAT		32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
NET PRODUCTION KG											
MILK		11775.0	13295.0	17855.0	25265.0	25805.0	28715.0	35990.0	35990.0	43265.0	50540.0
MEAT		659.2	659.2	1004.8	1264.0	1378.0	1378.0	2083.0	2365.0	2647.0	2858.5
SALES FARMGATE											
MILK											
AS 10.00/KG	$	117750.0	132950.0	178550.0	252650.0	258050.0	287150.0	359900.0	359900.0	432650.0	505400.0
MEAT											
AS 80.00/KG	$	52736.0	52736.0	80384.0	101120.0	110240.0	110240.0	166640.0	189280.0	211760.0	228680.0
GROSS SALES	$	170485.9	185685.9	258934.0	353770.0	368290.0	397390.0	526540.0	549180.0	644410.0	734080.0

AGENCY FOR INTERNATIONAL DEVELOPMENT
FINANCIAL ANALYSIS

DATE: 11/20/77 PROJECT# 2 — PERU SUB-TROPICAL LANDS (LIVESTOCK) WITH PROJECT — CASE#2 — PAGE 3

FARM BUDGET W/PROJECT		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
EXPENDITURES											
FAMILY LABOR	S	-25600.0	-27600.0	-30400.0	-45150.0	-45150.0	-45150.0	-45150.0	-45150.0	-45150.0	-45150.0
HIRED LABOR	S	0.0	0.0	0.0	-2850.0	-2850.0	-2850.0	-2850.0	-2850.0	-2850.0	-2850.0
FENCING/MILK PARLOUR	S	-6400.0	-6800.0	-9600.0	-12000.0	-12000.0	-12000.0	-12000.0	-12000.0	-12000.0	-12000.0
IMPLEMENTS	S	-1600.0	-1700.0	-2400.0	-3000.0	-3000.0	-3000.0	-3000.0	-3000.0	-3000.0	-3000.0
SEED PURCHASE	S	-800.0	-850.0	-1200.0	-1500.0	-1500.0	-1500.0	-1500.0	-1500.0	-1500.0	-1500.0
VET MEDICINE	S	-19200.0	-20400.0	-28800.0	-36000.0	-36000.0	-36000.0	-36000.0	-36000.0	-36000.0	-36000.0
MACHINERY	S	-5600.0	-5950.0	-8400.0	-10500.0	-10500.0	-10500.0	-10500.0	-10500.0	-10500.0	-10500.0
BALANCED FEED	S	-36000.0	-38500.0	-54000.0	-67500.0	-67500.0	-67500.0	-67500.0	-67500.0	-67500.0	-67500.0
SUBTOTAL	S	-95200.0	-101800.0	-142000.0	-178500.0	-178500.0	-178500.0	-178500.0	-178500.0	-178500.0	-178500.0
ADD. CASH INCOME + EXP.											
PRODUCTION CREDIT	S	69600.0	74200.0	104400.0	130500.0	130500.0	130500.0	130500.0	130500.0	130500.0	130500.0
PROD CREDIT REPAY	S	-80735.9	-86071.9	-121103.9	-151379.9	-151379.9	-151379.9	-151379.9	-151379.9	-151379.9	-151379.9
INTER CREDIT 16%	S	10000.0	19840.0	24426.3	-8464B.8	-9649[illegible].4	-9649[illegible].4	-9291[illegible].6	-21442.5	0.0	0.0
LAND CLEARANCE-1	S	-10000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAND CLEARANCE-2	S	0.0	-80000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAND CLEARANCE-3	S	0.0	0.0	-60000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PURCHASE	S	0.0	-120000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OFF FARM LABOR	S	2297.9	1071.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADDED INCOME + EXP	S	-8838.9	-12400.9	-52277.7	-105528.8	-117371.3	-117371.3	-113797.8	-42322.5	-20879.9	-20879.9
TOTAL FARM INCOME	S	86447.0	71485.0	638[illegible].3	69741.3	72418.7	101518.7	234242.4	328277.5	4[illegible]3030.1	534700.1
PRE-PROJECT INCOME	S	95650.1	110577.3	118313.4	126281.6	142207.8	158978.3	166906.9	174835.6	193319.0	212598.9
ON FARM NET BENEFIT	S	-29203.1	39092.3	-54477.1	-56540.4	69789.1	-57459.6	67335.5	153442.0	25171[illegible].1	322101.2
END OF YEAR CASH BAL.	S	92047.0	99085.0	102256.3	114891.3	117568.7	146668.7	279392.4	373427.5	490[illegible]80.1	579850.1

AGENCY FOR INTERNATIONAL DEVELOPMENT
ECONOMIC ANALYSIS

DATE: 11/20/77 PROJECT# 2 PERU SUB-TROPICAL LANDS (LIVESTOCK) WITH PROJECT CASE#2 PAGE 5

ECONOMIC BENEFIT W/PROJ		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
TOTAL FARM INCOME	$	66447.0	71485.0	63856.3	69741.3	72418.7	101518.7	234242.4	328277.5	445038.1	534700.1
SHADOW PRICE ADJ											
FAMILY LABOR ADJ.	$	12800.0	13800.0	19200.0	22575.0	22575.0	22575.0	22575.0	22575.0	22575.0	22575.0
TOTAL SDW PRICE ADJ	$	12800.0	13800.0	19200.0	22575.0	22575.0	22575.0	22575.0	22575.0	22575.0	22575.0
NET FARM BEN. W/ADJ	$	79247.0	85285.0	83056.3	92316.3	94993.7	124093.7	256817.4	350852.5	467605.1	557275.1
PROJECT & ADMIN COST	$	-150000.0	-150000.0	-150000.0	-150000.0	-150000.0	0.0	0.0	0.0	0.0	0.0
NET ECONOMIC CASHFLOW 30 HA	$	-70753.0	-64715.0	-66943.7	-57683.8	-55006.3	124093.7	256817.4	350852.5	467605.1	557275.1

AGENCY FOR INTERNATIONAL DEVELOPMENT
FINANCIAL ANALYSIS

DATE: 11/20/77 PROJECT# 2 PERU SUB-TROPICAL LANDS (LIVESTOCK) WITH PROJECT CASE#2 PAGE 2

ECONOMIC BENEFIT W/PROJ		YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20
LAND USE 30 HA											
DAIRY CATTLE		15.00	15.00	15.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BEEF CATTLE		15.00	15.00	15.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL LAND IN USE		30.00	30.00	30.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YIELD KG /Ha											
MILK		3500.0	3500.0	3500.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAT		205.0	205.0	205.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OUTPUT KG											
MILK		52500.0	52500.0	52500.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAT		3075.0	3075.0	3075.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ON FARM LOSSES KG											
MILK		1575.0	1575.0	1575.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAT		184.5	184.5	184.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOME CONSUMPTION KG											
MILK		385.0	385.0	385.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAT		32.0	32.0	32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NET PRODUCTION KG											
MILK		50540.0	50540.0	50540.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAT		2858.5	2858.5	2858.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SALES FARMGATE											
MILK											
$S 10.00/KG	S	505400.0	505400.0	505400.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAT											
$S 80.00/KG	S	228680.0	228680.0	228680.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GROSS SALES	S	734080.0	734080.0	734080.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

AGENCY FOR INTERNATIONAL DEVELOPMENT
FINANCIAL ANALYSIS

DATE: 11/20/77 PROJECT# 2 PERU SUB-TROPICAL LANDS (LIVESTOCK) WITH PROJECT CASE#2 PAGE 4

ECONOMIC BENEFIT W/PROJ		YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20
EXPENDITURES											
FAMILY LABOR	$	-45150.0	-45150.0	-45150.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HIRED LABOR	$	-2850.0	-2850.0	-2850.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FENCING/MILK PARLOUR	$	-12000.0	-12000.0	-12000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IMPLEMENTS	$	-3000.0	-3000.0	-3000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SEED PURCHASE	$	-1500.0	-1500.0	-1500.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VET MEDICINE	$	-36000.0	-36000.0	-36000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MACHINERY	$	-10500.0	-10500.0	-10500.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BALANCED FEED	$	-67500.0	-67500.0	-67500.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBTOTAL	$	-178500.0	-178500.0	-178500.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADD. CASH INCOME + EXP.											
PRODUCTION CREDIT	$	130500.0	130500.0	130500.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PROD CREDIT REPAY	$	-151379.9	-151379.9	-151379.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTER CREDIT 16%	$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAND CLEARANCE-1	$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAND CLEARANCE-2	$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAND CLEARANCE-3	$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PURCHASE	$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OFF FARM LABOR	$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADDED INCOME + EXP	$	-20879.9	-20879.9	-20879.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL FARM INCOME	$	534700.1	534700.1	534700.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PRE-PROJECT INCOME	$	212599.1	212599.1	212599.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ON FARM NET BENEFIT	$	322101.0	322101.0	322101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
END OF YEAR CASH BAL.	$	579850.1	579850.1	579850.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

AGENCY FOR INTERNATIONAL DEVELOPMENT
ECONOMIC ANALYSIS

DATE: 11/28/77 PROJECT# 2 PERU SUB-TROPICAL LANDS (LIVESTOCK) WITH PROJECT CASE#2 PAGE 6

ECONOMIC BENEFIT W/PROJ		YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20
TOTAL FARM INCOME	$	536778.1	536778.1	536778.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBSIDIARY INCOME											
FAMILY LABOR	$	22575.0	22575.0	22575.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL SUBSIDIARY	$	22575.0	22575.0	22575.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NET FARM INCR. W/PROJ	$	559353.1	559353.1	559353.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PROJECT W/OUT COST	$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NET ECONOMIC BENEFIT FOR PROJECT	$	559353.1	559353.1	559353.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

AGENCY FOR INTERNATIONAL DEVELOPMENT
PRESENT WORTH
&
RATE OF RETURN ANALYSIS

PROJECT # 2

PERU SUB-TROPICAL LANDS (LIVESTOCK) WITH PROJECT

CASE #2

ON FARM NET BENEFIT

YEAR	NET CASH FLOW	DISCOUNT RATE 0.25	DISCOUNTED CASH FLOW	DISCOUNT RATE 0.30	DISCOUNTED CASH FLOW
1.	-29203.	0.8000	-23363.	0.7692	-22464.
2.	-39092.	0.6400	-25019.	0.5917	-23132.
3.	-54477.	0.5120	-27892.	0.4552	-24796.
4.	-56540.	0.4096	-23159.	0.3501	-19796.
5.	-69789.	0.3277	-22869.	0.2693	-18796.
6.	-57440.	0.2621	-15063.	0.2072	-11904.
7.	67316.	0.2097	14121.	0.1594	10731.
8.	153442.	0.1678	25743.	0.1296	18810.
9.	251711.	0.1342	33784.	0.0943	23736.
10.	322101.	0.1074	34586.	0.0725	23365.
11.	322101.	0.0859	27669.	0.0558	17973.
12.	322101.	0.0687	22135.	0.0429	13825.
13.	322101.	0.0550	17708.	0.0330	10635.
		PRESENT WORTH =	38382.		-1813.
		RATE OF RETURN =	29.77%		

AGENCY FOR INTERNATIONAL DEVELOPMENT
PRESENT WORTH
&
RATE OF RETURN ANALYSIS

PROJECT # 2

PERU SUB-TROPICAL LANDS (LIVESTOCK) WITH PROJECT

CASE #2

END OF YEAR CASH BALANCE

THE RATE OF RETURN IS OVER 50%

B-3-25

AGENCY FOR INTERNATIONAL DEVELOPMENT
PRESENT WORTH
&
RATE OF RETURN ANALYSIS

PROJECT # 2

PERU SUB-TROPICAL LANDS (LIVESTOCK) WITH PROJECT

CASE #2

NET ECONOMIC CASHFLOW

YEAR	NET CASH FLOW	DISCOUNT RATE 0.40	DISCOUNTED CASH FLOW	DISCOUNT RATE 0.45	DISCOUNTED CASH FLOW
1.	-70753.	0.7143	-50538.	0.6897	-48795.
2.	-64715.	0.5102	-33018.	0.4756	-30780.
3.	-66944.	0.3644	-24396.	0.3280	-21959.
4.	-57684.	0.2603	-15016.	0.2262	-13049.
5.	-55006.	0.1859	-10228.	0.1560	-8582.
6.	124094.	0.1328	16481.	0.1076	13352.
7.	256817.	0.0949	24363.	0.0742	19057.
8.	350853.	0.0678	23774.	0.0512	17955.
9.	467605.	0.0484	22632.	0.0353	16503.
10.	557275.	0.0346	19266.	0.0243	13564.
11.	557275.	0.0247	13761.	0.0168	9355.
12.	557275.	0.0176	9830.	0.0116	6451.
13.	557275.	0.0126	7021.	0.0080	4449.
	PRESENT WORTH =		3931.		-22478.
	RATE OF RETURN =		40.74%		

PROJECT LOGICAL FRAMEWORK

PROJECT TITLE & NUMBER: SUB-TROPICAL LANDS DEVELOPMENT
PERU 527-0163

Life of Project:
From FY 78 to FY 83
Total U.S. Funding: $18.5 million
Data Prepared: November 1977

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: Increase productivity, incomes and employment among the rural poor in Peru.	Measures of Goal Achievement: 1. Increased rate of growth in the Agricultural Sector. 2. Increased rural per capita productivity. 3. Increased land in production. 4. Increase in rural employment and a decrease in rural underemployment.	1. National Statistics. 2. Census Data.	Assumptions for achieving goal targets: 1. The GOP continues to invest in the Agricultural Sector. 2. Mobility of agricultural labor force. 3. Prices in the Agricultural Sector keep pace with prices in other economic sectors.
Project Purpose: 1. Increase crop and livestock production in the Huallaga Central. 2. Establish and test a methodology for low cost development of new land. through optimal use of labor and capital resources in the high jungle.	Conditions that will indicate purpose has been achieved: End of project status. 1. Gross value of production increased more than 100% in the Project area. 2. 69,000 hectares in crops. 3. 23,000 hectares of land being double cropped. 4. 50,000 hectares of land in permanent pastures and tree crops. 5. Credit and extension services available for 15,000 farmers on a regular basis. 6. New production methodology disseminated throughout the Project area.	1. MINFOOD publications and records. 2. MINAG publications and records. 3. Agrarian Bank statistical publications and records. 4. EPSA purchases and sales records. 5. ERTS verification.	Assumptions for achieving purpose: 1. No major climatological disruptions. 2. Truck roads remain open. 3. Farmers accept new production methodology.

PROJECT LOGICAL FRAMEWORK

PROJECT TITLE & NUMBER: SUB-TROPICAL LANDS DEVELOPMENT
PERU 527-0163

Life of Project:
From FY 78 to FY 83
Total U.S. Funding: $13.5 million
Date Prepared: November 1977

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Outputs	Magnitude of Outputs:		Assumptions for Achieving Outputs:
1. Penetration Roads.	1. 97.3 Kms of constructed roads 76.4 Kms of improved roads	1. MTC records and roads constructed and improved.	1. Escalation costs story within estimated limits.
2. Road Maintenance Equipment Unit.	2. One equipped maintenance unit.	2. MTC records.	2. An agreement between the MINAG and the Agrarian Bank is signed to implement the credit program.
3. Medium-Term Credit Program.	3. Medium-term credit fund.	3. MINAG and AGBANK statistical publications and records.	3. That A.I.D. and GOP counterpart funds are disbursed as required.
4. Machinery Parks.	4. One machinery center and four sub-centers, equipped with V3 units including vehicles and heavy equipment.	4. MTC and SENAMA records.	4. Land tenure conflicts will be minorized.
5. Marketing and Collection Centers.	5. One major collection center and four sub-centers with a total capacity of 9,000 Metric Tons.	5. EPSA records.	
6. Land Surveying and Titling.	6. 15,000 verified possession documents.	6. MINAG records.	
7. Extension Service	7. Seventy equipped extension agents. Research work published by Regional Research Station.	7. MINFOOD records.	
8. Resources Studies.	8. Two additional geographic areas for replication of the Project identified.	8. ONERN records and publications.	

PROJECT LOGICAL FRAMEWORK

PROJECT TITLE & NUMBER: SUB-TROPICAL LANDS DEVELOPMENT
PERU 527-0163

Life of Project:
From FY 78 to FY 83
Total U.S. Funding: $18.5 million
Date Prepared: November 1977

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Inputs Financial Plan and Implementation Plan are presented in Part III B. and Part IV C. respectively	Implementation Target (Type and Quantity)		
1. For Penetration Roads			
- Financing for road design, construction and supervision	U.S. $8.3 million		
2. For Road Maintenance			
- Vehicles	- 15 units		
- Road equipment & other	- 3 road graders, 1 front loader, 1 tractor crawler, 1 roller tandem, 1 air compressor, 1 concrete mixer		
- Work force	- 4 foreman 30 workers		
- Spare parts	- U.S. $200,000		
3. For Medium-Term Credit			
- Money for subleanding	- U.S. $3.5 million		
- Vehicles	- 21 units		
- Boats	- 14 units		
- Generators	- 5 units, each one of 5 K.W.		
- Office equipment	- U.S. $34,000		
- Additional Technicians	- 10 for Lima and field staff for 6 years		
- Spare parts and materials	- U.S. $80,000		
4. For Machinery Parks			
- Vehicles	- 31 units		
- Heavy duty road equipment	- 10 crawler type tractors (D-4) 4 crawler type tractors (D-6) 4 front-end loader		
- Agricultural Equipment	- 16 equipped wheeled tractors and 8 threshers		
- Work force	- 50 technicians		
- Spare parts and materials	- U.S. $400,000		
5. For Marketing and Collection Centers			
- Money for construction of collection centers	- U.S. $265,250		
- Vehicles	- 15 units		
- Grain handling equipment	- For 5 storage facilities		
- Testing equipment and other complementary equipment	- For 5 equipped grain testing laboratories		
- Work force	- 40 persons		
- Spare parts and materials	- U.S. $100,000		
6. For Land Surveying and Titling			
- Vehicles	- 9 units		
- Boats	- 18 units		
- Surveying equipment, drafting tools and camping equipment	- For 4 fully equipped surveying and drafting teams (32 people)		
- Office equipment	- U.S. $19,000		
- Professional and operating personnel	- 30 technicians		
- Spare parts and materials	- U.S. $84,000		

PROJECT LOGICAL FRAMEWORK

PROJECT TITLE & NUMBER: SUB-TROPICAL LANDS DEVELOPMENT
PERU 527-0163

Life of Project:
From FY 78 to FY 83
Total U.S. Funding: $18.5 million
Date Prepared: November 1977

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
7. For Extension Services			
- Extension agents	- 70 technicians (20 agronomists)		
- Vehicles	- 30 pick up trucks and 63 motorcycles		
- Boats	- 18 units		
- Agricultural equipment	- 70 spray pumps and 30 hand tools		
- Generators	- 6 electric generators, gasoline motor 220 v. and 60 cycles		
- Surveying equipment	- 6 land measuring wheels, calibrated in meters		
- Fertilizers, pesticides & fungicides	- U.S. $40,000		
- Spare parts and materials	- U.S. $190,000		
8. For Resources Studies			
- Funding for equipment materials and personnel	- U.S. $139,000		
9. For Project Direction			
- Money for equipment materials and personnel	- U.S. $594,000		
10. For Technical Assistance			
- Professional services for Machinery Parks (Dollar funded)	- 12.5 man-years		
- Professional services for Marketing & Collection Centers (Dollar funded)	- 5 man-years		
- Professional services for Resources Studies (Dollar funded)	- 3 man-years		
- Money for contracting professional services (Local Currency funded)	- U.S. $458,000		

6C(1) - COUNTRY CHECKLIST

Listed below are, first, statutory criteria applicable generally to FAA funds, and then criteria applicable to individual fund sources: Development Assistance and Security Supporting Assistance funds.

A. GENERAL CRITERIA FOR COUNTRY

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in consistent pattern of gross violations of internationally recognized human rights?	1. The project is designed to facilitate increased agricultural production in a large area of Peru's high jungle (Huallaga Central) which is composed largely of poor small farmers, mostly former immigrants from the overcrowded adjacent highland areas.
2. FAA Sec. 481. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics 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?	2. The GOP 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.
3. FAA Sec. 620(a). 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?	3. No longer applicable.
4. FAA Sec. 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement?	4. Yes.
5. FAA Sec. 620(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?	5. No known instance.
6. FAA Sec. 620(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?	6. The GOP is fully aware of USG requirements for prompt, adequate and effective compensation regarding expropriation of U.S. investments. To date there have been several expropriation claims settled to the satisfaction of both Governments, including Marcona Mining Company's claim in September 1976. The only outstanding expropriation claim is that of Gulf Oil Corp. Negotiations are continuing and a resolution is expected shortly.

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7.	FAA Sec. 620(f); App. Sec. 108. Is recipient country a Communist country? Will assistance be provided to the Democratic Republic of Vietnam (North Vietnam), South Vietnam, Cambodia or Laos?	7.No.
8.	FAA Sec. 620(i). Is recipient country 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?	8.No.
9.	FAA Sec. 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?	9.No.
10.	FAA Sec. 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason?	10.The Administrator has taken Peru's limited guaranty program into consideration in determining to continue to furnish assistance to Peru.
11.	FAA Sec. 620(o); Fishermen's Protective Act, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters, a. has any deduction required by Fishermen's Protective Act been made? b. has complete denial of assistance been considered by AID Administrator?	11.(a)No deduction has been required. 11.(b)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.
12.	FAA Sec. 620(q); App. Sec. 504. (a) Is the government of the recipient country in default on interest or principal of any AID loan to the country? (b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds, unless debt was earlier disputed, or appropriate steps taken to cure default?	12.No.
13.	FAA Sec. 620(s). 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).)	13.Approximately 15% of the GOP's current budget is allocated for military expenditures.

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14. FAA Sec. 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?

14.No.

15. FAA Sec. 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 AID Administrator in determining the current AID Operational Year Budget?

15.AID/W has recently informed us that Peru's status regarding its UN obligations is essentially the same as reported by State/IO in March 1975: "The amount currently owed by Peru to the UN is not sufficient to trigger the 620(u) provision."

16. FAA Sec. 620A. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?

16.No.

17. FAA Sec. 665. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA?

17.No.

18. FAA Sec. 669. Has the country delivered or received nuclear reprocessing or enrichment equipment, materials or technology, without specified arrangements on safeguards, etc.?

18.No.

19. FAA Sec. 901. Has the country denied its citizens the right or opportunity to emigrate?

19.No.

B. FUNDING CRITERIA FOR COUNTRY

1. Development Assistance Country Criteria

a. FAA Sec. 102(c), (d). Have criteria been established, and taken into account, to assess commitment and progress of country in effectively involving the poor in development, on such indexes as: (1) small-farm labor intensive agriculture, (2) reduced infant mortality, (3) population growth, (4) equality of income distribution, and (5) unemployment.

B.1.(a)Yes. The GOP has assigned priority to these areas in its development plans.

b. FAA Sec. 201(b)(5), (7) & (8); Sec. 208; 211(a)(4), (7). Describe extent to which country is:

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

B.1.(b)The GOP has assigned high priority to increasing food production. A Ministry of Food was established in 1975 with responsibility for technical assistance in production and marketing of food crops. In the context of its industrial reform program 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. B.1.(b).5)

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

81b

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

B.1.(b)(3)Programs in Industry (Industrial Law), Fishing (Fishing Law), Mining (Mining Law), Agrarian Reform, and Social Property are especially designed to achieve this objective.

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

(b) Diverting such resources for unnecessary military expenditure and intervention in affairs of other free and independent nations.

B.1.(b)(4)Sizeable portions of the GOP's current budget are being allocated to top priority programs in educational, agricultural and industrial reform.
B.1.(b)(4)(b)See Item No. A.13.

(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.

(5)Tax collections have improved and land reform has received top Government priority. Much of the press is Government managed. The current regime has slowed the tendency toward expansion of state enterprises, e.g. recently the GOP completed the sale of its large fishing fleet back to private enterprise.

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

(6)The reforms of the present Government are founded on the principles of equality and active participation by all Peruvians.

c. FAA Sec. 201(b), 211(a). Is the country among the 20 countries in which development assistance loans may be made in this fiscal year, or among the 40 in which development assistance grants (other than for self-help projects) may be made?

201(b)Yes.
211(a)Peru is among the countries in which development assistance grants may be made.

d. FAA Sec. 115. Will country be furnished, in same fiscal year, either security supporting assistance, or Middle East peace funds? If so, is assistance for population programs, humanitarian aid through international organizations, or regional programs?

d.No.

2. Security Supporting Assistance Country Criteria

a. FAA Sec. 502B. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights? Is program in accordance with policy of this Section?

a.No.

b. FAA Sec. 531. Is the Assistance to be furnished to a friendly country, organization, or body eligible to receive assistance?

b.Yes.

c. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

c.Not applicable for this project.

6C(2) - PROJECT CHECKLIST

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

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

A. GENERAL CRITERIA FOR PROJECT.

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

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

a) This project was included in the FY 1978 Congressional Presentation.

b) Yes.

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

a) Yes.

b) Yes.

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

No further legislative action is required.

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

Not applicable.

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

The Mission Director has so certified.

A.

6. FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multilateral organizations or plans to the maximum extent appropriate?	Assistance in project development was performed by COPERHOLTA, a development foundation from Holland. At the present time no multilateral or regional agencies have expressed interest in participating in the project.
7. FAA Sec. 601(a); (and Sec. 201(f) for development loans). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.	The Project will improve the technical efficiency of the agricultural sector in the project area.
8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).	The project will affect US trade only to the extent that commodities and technicians may be provided from US sources.
9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.	There are no US owned foreign currencies available in Peru. About 29% of the project cost will be borne by the GOP.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?	No excess US owned foreign currencies are available in Peru.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?	The project will directly affect the rural poor by raising agricultural productivity in the areaof the Peruvian high jungle known as the Huallaga Central. The population of this area has a per capita between $100 and $200 (one fourth the national average).

B1

b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: [Include only applicable paragraph -- e.g., a, b, etc. -- which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.]

(1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers;

The project is specifically designed to increase the productivity and incomes of the rural poor via stimulation of agricultural production in the Peruvian high jungle.

(2) [104] for population planning or health; if so, extent to which activity extends low-cost, integrated delivery systems to provide health and family planning services, especially to rural areas and poor;

(3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;

(4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:

(a) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;

(b) to help alleviate energy problem;

(c) research into, and evaluation of, economic development processes and techniques;

(d) reconstruction after natural or manmade disaster;

(e) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

(f) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

g. FAA Sec. 201(b)(2)-(4) and -(8); Sec. 201(e); Sec. 211(a)(1)-(3) and -(8). Does the activity give reasonable promise of contributing to the development: of economic resources, or to the increase of productive capacities and self-sustaining economic growth; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?	The project activity gives reasonable promise of significantly increasing agricultural production in the project area and contributing towards self-sustaining economic growth. Information on economic and technical soundness is contained in the project paper.
h. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position.	No effects on the U.S. economy are expected as a result of this project. US commodities and assistance will be provided in a manner consistent with safeguarding the US balance of payments position.
Development Assistance Project Criteria (Loans only)	
a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.	AUSPVD may provide assistance in the area of improving health and sanitation in the project area (CARE).
b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.	The GOP acknowledges the terms of the loan and no problems are expected with loan repayments.
c. FAA Sec. 201(e). If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds $100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?	Yes.
d. FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?	Yes. The project paper directly describes the needs for increased agricultural production in relation to Peru's overall economic development and available resources.

e. FAA Sec. 202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources?

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

No assistance will be given to productive enterprises which will compete in the US with US enterprise.

3. Project Criteria Solely for Security Supporting Assistance

FAA Sec. 531. How will this assistance support promote economic or political stability?

Not applicable.

4. Additional Criteria for Alliance for Progress

[Note: Alliance for Progress projects should add the following two items to a project checklist.]

a. FAA Sec. 251(b)(1), -(8). Does assistance take into account principles of the Act of Bogota and the Charter of Punta del Este; and to what extent will the activity contribute to the economic or political integration of Latin America?

Yes, Project is country specific and will not directly contribute to the economic or political integration of Latin America.

b. FAA Sec. 251(b)(8); 251(h). For loans, has there been taken into account the effort made by recipient nation to repatriate capital invested in other countries by their own citizens? Is loan consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress (now "CEPCIES," the Permanent Executive Committee of the OAS) in its annual review of national development activities?

Yes.

ANNEX F

CERTIFICATION PURSUANT TO SECTION 611 (e) OF THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, Leonard Yaeger, the principal officer of the Agency for International Development in Peru, having taken into account among other factors the maintenance and utilization of projects in Peru previously financed or assisted by the United States, do hereby certify that in my judgment Peru has both the financial capability and the human resources capability to effectively maintain and utilize the capital assistance project:
SUB-TROPICAL LANDS DEVELOPMENT.

Leonard Yaeger
Director, USAID/Peru

CAP - TUNTYMAN

ANNEX G

MINISTERIO DE ECONOMIA Y FINANZAS

COPY

Lima, 22 AGO. 1977

OFICIO N° 1592-77-EF/75.21.

U. LIMA
24 AGO 1977
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SEÑOR : Leonard Yaeger
Director de AID en el Perú

ASUNTO : Proyecto de Desarrollo de las Cuencas de los Ríos Huallaga Central y Bajo Mayo.

Tengo el agrado de dirigirme a Ud., en relación al asunto en referencia, y sobre el cual el Instituto Nacional de Planificación en coordinación con los Ministerios correspondientes, ha elaborado el Plan de Desarrollo Microregional de Huallaga Central y Bajo Mayo.

Los proyectos de inversión que en principio se han identificado, en coordinación con AID, requieren de un financiamiento del orden de US$ 15'0 millones. Dichos recursos permitirán ejecutar el Programa de Inversiones a partir de 1978. La contrapartida peruana se ha estimado en el equivalente a US$ 10'0 millones, recursos que serán comprometidos con cargo al Tesoro Público a partir del año 1979.

El proyecto cuenta con la prioridad correspondiente, estando por finalizar las coordinaciones del caso para designar al Sub-Comité de Desarrollo de Tarapoto como Unidad Ejecutora, el cual tendrá como responsabilidad la ejecución y coordinación del proyecto.

Por lo expuesto, solicito a nombre del Gobierno Peruano la cooperación de la Agencia para el Desarrollo Internacional en el financiamiento del indicado proyecto, por una suma del orden de US$ 15'0 millones en las condiciones más favorables que concede AID.

Es propicia la oportunidad para expresarle los sentimientos de mi especial consideración.

Atentamente,

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General de Brigada EP.
ALCIBIADES SAENZ BARSALLO
Ministro de Economía y Finanzas

MINISTERIO DE ECONOMIA Y FINANZAS

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Lima,

OFICIO N° 2185 -77-EF/75.21

SEÑOR : Leonar Yeager
Director de AID en el Perú

ASUNTO : Proyecto de Desarrollo de las Cuencas de los Ríos Huallaga Central y Bajo - Mayo.

REFERENCIA : Oficio N° 1592-77-EF/75.21

Tengo el agrado de dirigirme a usted en relación al asunto en referencia y sobre el cual solicitáramos un préstamo por US$ 15'000,000 a fin de financiar parcialmente el proyecto.

En razón a que durante 1978 y 1979 sería imposible asignar recursos de contrapartida, solicitamos a usted tenga a bien gestionar el aumento del monto del préstamo a US$ 18'500,000, cifra que incluiría un monto a dirigirse al financiamiento de gastos locales durante los años 1978 y 1979.

En consecuencia, el aporte de contrapartida a ser consignado por el Tesoro Público sería del orden de US$ 6'500,000 a partir del año 1980.

Con este motivo, aprovecho la oportunidad para reiterar a usted los sentimientos de mi especial consideración.

Atentamente,

FEF

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Department of State

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AIDAC

E.O. 11652: N/A
SUBJ: SUB-TROPICAL LANDS DEVELOPMENT

USAID HAS RECEIVED FROM DIRECTOR GENERAL OF PUBLIC CREDIT OF THE MINISTRY OF ECONOMY AND FINANCE, AN OFFICIAL REPRESENTATIVE OF THE GOP, A LETTER DATED DECEMBER 9, 1977 REQUESTING ADDITIONAL AID LOAN FINANCING FOR SUBJECT PROJECT. LETTER REQUESTS A LOAN OF $19.0 MILLION WITH A COUNTERPART CONTRIBUTION OF $6.5 MILLION. COPY OF LETTER BEING POUCHED TO LA/DR.
SHLAUDEMAN

ACTION
INFO:
RM/R FILES

1977 DEC 12 PM 2 29

ANNEX H

DEPARTMENT OF STATE

AGENCY FOR INTERNATIONAL DEVELOPMENT

WASHINGTON

THE ADMINISTRATOR

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

Name of Country : Peru
Name of Project : Sub-Tropical Lands Development
Number of Project : 527-0163

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a loan ("Loan"), to the Government of Peru ("Borrower") of not to exceed nineteen million United States Dollars ($19,000,000) to assist in financing the United States dollar and local currency costs of a Peruvian high jungle known as the Huallage Central-Baja Mayo ("Project"). Project components to be financed are: roads, road maintenance, agricultural credits, land clearing and farm machinery equipment and services, marketing facilities and services, land surveying and titling activities, extension services, resource studies, and technical assistance. The Loan shall be subject to the following terms and conditions:

I. Interest Rate and Terms of Repayment

Borrower shall repay the Loan to A.I.D. in United States dollars within twenty (20) years from the date of the first disbursement under the Loan, including a grace period of not to exceed seven (7) years. Borrower shall pay to A.I.D. in United States dollars interest at the rate of two percent (2%) per annum during the grace period and three percent (3%) per annum thereafter on the outstanding disbursed balance of the Loan and on any due and unpaid interest.

II. Other Terms and Conditions

A. Except for ocean shipping, goods and services financed under the Loan shall have their source and origin in Peru or countries included in A.I.D. Geographic Code 941. Ocean shipping financed under the Loan shall be procured in any eligible source country except Peru.

B. Prior to the first disbursement under the Loan, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, Borrower shall furnish A.I.D. in form and substance satisfactory to A.I.D.:

evidence of legislation establishing a regional authority for implementation of the Project.

C. Prior to any disbursement under the Loan, or issuance by A.I.D. of documentation pursuant to which disbursement will be made, to finance disbursements for other than technical assistance, Borrower will furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(1) evidence of implementing legislation for Project administrative organization and assignment of Project director and other key Project personnel;

(2) an implementation plan for the Project which will include a time-phased plan for Borrower counterpart contribution and an environmental resource protection plan.

D. Prior to any disbursement under the Loan, or issuance by A.I.D. of documentation pursuant to which disbursement will be made to finance activities under the road construction element of the loan, Borrower will furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(1) For road design: executed contract(s) for engineering services for final design and supervision of road construction.

(2) For construction activities: executed contract(s) for construction of road sub-project(s).

(3) A detailed plan for maintenance of the road for which new construction or improvement designs have been approved.

E. Prior to disbursement under the Loan, or issuance by A.I.D. of documentation pursuant to which disbursement will be made to finance construction costs for the marketing centers, Borrower will furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(1) Completed marketing facility designs compatible with completed equipment specifications;

(2) Executed construction contract(s) for the marketing facilities;

(3) A maintenance plan for each facility for which designs have been approved.

F. Prior to disbursement under the Loan, or issuance by A.I.D. of documentation pursuant to which disbursement will be made to finance construction costs for machinery parks, Borrower will furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(1) Completed machine shop designs compatible with completed equipment specifications;

(2) Executed construction contract(s) for the machine shop(s);

(3) A maintenance plan for each facility for which designs have been approved.

G. Prior to disbursement under the Loan, or issuance by A.I.D. of documentation pursuant to which disbursement will be made to finance the medium term credit and credit infrastructure, Borrower will furnish A.I.D. in form and substance satisfactory to A.I.D.:

Evidence of the establishment of a facility in the Agricultural Bank for sublending for on-farm land clearing and other specific farm improvements, including a description of procedures, administrative responsibilities, eligibility criteria and sublending terms and conditions.

H. Borrower will covenant that:

(1) Borrower and ("SENAMA") in particular will provide on a timely basis replacement equipment and spare parts for the Project as required, including necessary imported equipment and parts;

(2) Revenue generated by SENAMA in the Project area will be reinvested exclusively in the Project area; and

(3) Road maintenance equipment will be assigned in sufficient quantities to assure all-year operation of the existing road from Jaunjui through Tarapoto to Chiclayo.

(4) Borrower will conduct an annual review of its food pricing policy with respect to its impact on agricultural production in the project area.

_____
Administrator

_____
Date

Clearance:

LA/SA,RWeber_____ Date_____
LA/DR,WStickel_____ Date_____
LA/DR,MBrown_____ Date_____
LA/DR,CWeinberg_____ Date_____
PPC/DPR,EHogan_____ Date_____
SER/FM/CMDStafford__ Date_____
AA/PPC,AShakow_____ Date_____
GC,MBall_____ Date_____
AA/LA,AValdez_____ Date_____

GC/LA,JLKessler:lb:1/13/78