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UNCLASSIFIED

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

PROJECT PAPER

PERU

FRESH WATER FISHERIES DEVELOPMENT

Project Number 527-0144

LA/DR:TT-4

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE: [A] A ADD, C CHANGE, D DELETE — PP

2. DOCUMENT CODE: 3

3. COUNTRY ENTITY: PERU

4. DOCUMENT REVISION NUMBER: [ ]

5. PROJECT NUMBER (7 digits): [527-0144]

6. BUREAU OFFICE: A. SYMBOL: LA; B. CODE: [03]

7. PROJECT TITLE (Maximum 40 characters): [Fresh Water Fisheries Development]

8. ESTIMATED FY OF PROJECT COMPLETION: FY [8 0]

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY [7 7]; B. QUARTER [2] (Enter 1, 2, 3, or 4); C. FINAL FY [7 7]

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						
(GRANT)	(301)	(164)	(465)	(301)	(164)	(465)
(LOAN)	( )	( )	( )	( )	( )	( )
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY					386	386
OTHER DONOR(S)					13	13
TOTALS				301	563	864

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 77 F. GRANT	E. 1ST FY 77 G. LOAN	H. 2ND FY — I. GRANT	H. 2ND FY — J. LOAN	K. 3RD FY — L. GRANT	K. 3RD FY — M. LOAN
(1) FN	142	077		465					
(2)									
(3)									
(4)									
TOTALS				465					

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					465	
(2)						
(3)						
(4)						
TOTALS					465	

12. IN-DEPTH EVALUATION SCHEDULED: MM YY [6 8 0]

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET. [2] 1 = NO, 2 = YES

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: Donald Finberg

TITLE: Director, USAID/Peru

DATE SIGNED: MM DD YY [1 2 2 8 7 6]

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY [0 1 0 6 7 7]

AID 1330-4 (3-76)

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AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I

1. TRANSACTION CODE: [A] A = ADD, C = CHANGE, D = DELETE — PAF

2. DOCUMENT CODE: 5

3. COUNTRY ENTITY:

4. DOCUMENT REVISION NUMBER:

5. PROJECT NUMBER (7 digits): [527-0144]

6. BUREAU OFFICE: A. SYMBOL: [LA] B. CODE: [03]

7. PROJECT TITLE (Maximum 40 characters): [Fresh Water Fisheries Development]

8. PROJECT APPROVAL DECISION: ACTION TAKEN: [A] A = APPROVED, D = DISAPPROVED, DE = DEAUTHORIZED

9. EST. PERIOD OF IMPLEMENTATION: YRS. [03] QTR. [1]

10. APPROVED BUDGET AID APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY 77 F. GRANT	E. 1ST FY 77 G. LOAN	H. 2ND FY ___ I. GRANT	H. 2ND FY ___ J. LOAN	K. 3RD FY ___ L. GRANT	K. 3RD FY ___ M. LOAN
(1) FN	142	077		465					
(2)									
(3)									
(4)									
TOTALS				465					

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)					465	
(2)						
(3)						
(4)						
TOTALS					465	

11. PROJECT FUNDING AUTHORIZED (ENTER APPROPRIATE CODE(S): 1 = LIFE OF PROJECT, 2 = INCREMENTAL LIFE OF PROJECT): A. GRANT: 1; B. LOAN:

C. PROJECT FUNDING AUTHORIZED THRU: FY [72]

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED ($000)

B. ALLOTMENT REQUEST NO. ___

A. APPROPRIATION	C. GRANT	D. LOAN
(1) FN	465	
(2)		
(3)		
(4)		
TOTALS	465	

13. FUNDS RESERVED FOR ALLOTMENT

TYPED NAME (Chief, SER/FM/FSD)

SIGNATURE

DATE

14. SOURCE/ORIGIN OF GOODS AND SERVICES: [X] 000 [ ] 941 [ ] LOCAL [ ] OTHER ___

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

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FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE MM DD YY	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE MM DD YY

AID 1330-2 (7-76)

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

Name of Country:	Peru
Name of Project:	Fresh Water Fisheries Development
Project Number :	527-0144

Pursuant to Part 1, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a Grant to Peru the "Cooperating Country" of not to exceed four hundred sixty-five thousand United States Dollars ($465,000) the "Authorized Amount" to help in financing certain foreign exchange and local currency costs of goods and services required for the project as described in the following paragraph.

This is a pilot project (Project) which proposes to establish a viable model for increasing trout production in Peru by demonstrating that (1) intensive production and sale of trout is an economically feasible enterprise constituting an additional source of income for subsistence farmers; and (2) extensive production of lake trout for direct farm consumption can significantly improve the protein diet of the rural poor. A.I.D. funds will finance equipment, commodities, vehicles, short-term U.S. technical assistance, long and short-term participant training and certain installation and start-up costs. The entire amount of the A.I.D. financing herein authorized for the project will be obligated when the Project Agreement is executed.

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

A. Goods and services financed by A.I.D. involving foreign exchange expenditures under the Project shall have their source and origin in the United States, except as A.I.D. may otherwise agree in writing. Goods and services financed by A.I.D. involving local currency expenditures under the Project shall have their source and, except as A.I.D. may otherwise agree in writing, their origin in Peru.

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B. Prior to any disbursement, or the issuance of any commitment document under the Project Agreement, the Grantee shall furnish A.I.D., in form and substance satisfactory to A.I.D., (i) Evidence that the site has been formally obtained on a long-term basis for the feed pelleting plant in Chimbote; (ii) Agreements between the Ministry of Fisheries and each of the three cooperating farmer communities specifying the responsibilities of each party and the sub-implementation plan, which agreements shall also include a statement of principle concerning the priority uses of receipts from sales; and (iii) Evidence that the Government has bestowed exclusive rights for stocking and harvesting of lakes Parhuay and Querococha to the farmer communities of Acopalca and Catac respectively.

C. The Project Agreement shall provide that no disbursements shall be made after thirty-six (36) months from the date of signing of the Project Agreement.

Donor M. Lion, Acting
Assistant Administrator
Bureau for Latin America

3-14-71

Clearances:
LA/DR:CBWeinberg
LA/SA:RBallantyne
LA/DP:LSmucker
GC/LA:OKessler

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ACTING
ACTION MEMORANDUM FOR THE/ASSISTANT ADMINISTRATOR (LA)

FROM: LA/DR, Charles B. Weinberg

Problem: To authorize the Peru Fresh Water Fisheries Development grant.

Discussion: On January 14, 1977, the DAEC reviewed and approved the PP for a Fresh Water Fisheries Development grant project in Peru. The project will require a one-time obligation of $465,000 in FY 1977. The project appeared on page 269 of the FY 1977 Congressional Presentation, but at an initial FY 1977 funding level of $150,000. Therefore, an Advice of Program Change was sent to the Congress citing the change from incremental to life of project funding. The required fifteen-day notification waiting period expired March 4, and funds may now be obligated through Mission signature of a Project Agreement.

This is a pilot project which proposes to establish a viable model for increasing trout production in Peru by demonstrating that (1) intensive production and sale of trout is an economically feasible enterprise constituting an additional source of income for subsistence farmers; and (2) extensive production of lake trout for direct farm consumption can significantly improve the protein diet of the rural poor. AID funds will finance $85,000 in short-term technical assistance; $240,000 in equipment, commodities and vehicles; $70,000 in training of counterparts; and $70,000 in initial start up costs. The GOP contribution of $380,000 (45% of total project cost) will provide technical and administrative personnel, construction costs, initial operating costs of a feed plant, and hatchery operating costs. Participating communities will contribute land, existing facilities and labor valued at $13,000 to the project.

The PP is attached for your information. The only changes made in the PP, resulting from the DAEC review, were to (1) add a section discussing the role of women in the project, (2) include an initial survey to collect baseline data for future evaluation purposes, (3) provide a breakdown of technical assistance costs, and (4) shift first year salary costs of the administrator of the feed pelleting plant from AID to Host Country funds.

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Recommendation: That you sign the attached Project Authorization and Request for Allotment of Funds (PAF) form thereby approving the project and authorizing the Mission to sign a Project Agreement for the Fresh Water Fisheries Development grant.

Attachments: TAB A - PAF Form
TAB B - Project Paper

LA/DR:KKelly:gah:2/14/77

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TABLE OF CONTENTS

PROJECT PAPER

FRESH WATER FISHERIES DEVELOPMENT

I. Summary and Recommendations

A. Face Sheet

B. Recommendations

USAID/Peru recommends that AID/W authorize a full-funded grant in the amount of $465,000 to assist the Government of Peru, through the Fresh Water Fisheries Division of the Ministry of Fisheries, to develop and test through demonstration a viable model for the production of trout by poor rural communities, thereby increasing their incomes and protein availabilities.

C. Summary Description of the Project

Nearly half of Peru's population is located in the sierra highlands. The majority of these are engaged in agricultural pursuits but, due to the limited agriculturally-productive land base, over-population, harsh terrain and severe climate, farm family incomes are very low and there exists a high incidence of malnutrition. Although for some of these farmers increased incomes and an improved quality of life are realizable through the adoption of improved technologies (irrigation, new seeds, fertilizers, etc.), for many increased incomes will be achievable only through diversification of production and through off-farm employment.

The rural population of the sierra constitute the bulk of the poorest majority in Peru and is AID's primary target group. The DAP envisages a variety of assistance approaches to meet the critical needs of this target group. Included are programs to increase on-farm productivity of traditional products (e.g. Improved Land and Water Use in the Sierra, Highland Corn Production, Appropriate Rural Technology, etc.) and programs designed to generate new employment opportunities, both on and off the farm (e.g. Rural Enterprises Development and Development of Sub-Tropical Lands).

The proposed Fresh Water Fisheries Development project is designed to provide new income and protein sources for the sierra population. This project is not only consistent with the DAP but is also directly in keeping with the Administrator's proposal, announced to the House International Relations Committee on July 22, 1976, to emphasize managed fish production as a major untapped resource. The proposed project is a concrete measure in execution of the announced "concerted, sustained effort to bring these fish production potentialities to fruition." Furthermore, this proposal responds directly

to a GOP initiative. Considerable GOP effort and investment have already been devoted to development of a fisheries program in the sierra. In Ancash alone 2 hatcheries and 5 fish farms are in operation; six fish farms as well as another major hatchery are under construction. The Ministry of Fisheries is engaged in an active trout rearing training program at the community level.

The specific purpose of the Peru project is to develop and test through demonstration a viable model for the production of trout by poor, rural, highland communities which will increase their incomes and animal protein availabilities. The key element in the proposed project is the development of a low-cost, balanced feed. Analysis of initial Peruvian trout production efforts have indicated good quality water for trout and appropriate facilities design, but inadequate attention to feed and diets. This has resulted in a current feed to meat conversion ratio of four-five to one. U.S. fisheries consultants have indicated that use of a balanced feed should readily result in a conversion ratio of 2 to 1, and this target has been adopted for the pilot program. In addition to balanced feed, genetically improved trout species will be introduced under the project

In summary form, the major elements of this demonstration project in the Department of Ancash are as follows:

1. The establishment of an experimental, medium capacity trout feed pelleting plant with an ultimate capacity of one metric ton per day. This facility will develop and market the low cost, balanced feed critical to reducing the feed/meat conversion ratio, and thus the overall profitability of community fish production enterprises.

2. The improvement of the fish hatchery at Huaraz. This hatchery will produce fingerlings and will be the principal instrumentality for introducing genetically improved trout species to community owned and operated fish farms throughout the Department of Ancash.

3. Two community trout fish farms (rearing stations) will be established, one in the Huaylas Valley (Huashao), the other in the Conchucos Valley (Acopalca). These rearing stations will produce for the commercial markets and will represent an important source of income for the participating communities.

4. Two community controlled lakes will be stocked, one each in the Huaylas (Catac) and Conchucos Valleys (Acopalca). These trout will be harvested by the communities for self-consumption and for regional marketing of the surplus.

The project design conceives these six activities as five sub-projects. This is due to the fact that one of the rearing stations and one of the lakes will both be administered by (and will benefit) the farmer community of Acopalca in the Conchucos valley. Therefore, in addition to two public sector sub-projects (pelleting plant and Huaraz hatchery) the project provides three sub-models for demonstration and evaluation purposes at the community level:

Sub-model A - Rearing station only (Huashao)

Sub-model B - Lake production only (Catac)

Sub-model C - Combined rearing station and lake production (Acopalca)

Table I-C-1 summarizes these sub-projects and their planned output and the interrelationships of the sub-project are presented graphically on Chart I-C-1. The accompanying map indicates the locations of the sub-projects.

For execution of these activities, appropriate training will be provided to technicians of the Ministry of Fisheries and the cooperating communities in such areas as fish culture, nutrition, biology, fish processing and business administration. Promotion of local fish consumption will also be undertaken by the Ministry of Fisheries.

AID inputs will finance required equipment, commodities and vehicles supporting implementation of planned activities in the approximate amount of $240,000. Thirty-three weeks of short term U.S. technical assistance costing approximately $85,000 will be provided, primarily during the first eighteen months of project activities. Fifty-six man-months of long and short term training in the U.S. and third countries costing approximately $70,000 is planned. Lastly, AID will finance certain installation and other start-up costs of project initiation costing approximately $70,000.

If anticipated targets are met, two net results will occur:

(1) new protein sources will be developed in both the lakes and rearing stations for local consumption;

(2) surplus trout fish will be available for local, regional and national marketing for extra income.

By the end of the four year project life the cash flows of the trout rearing enterprises should be sufficient to pay for annual expenses including feed, fish replacement and labor as well as produce a net profit to the community.

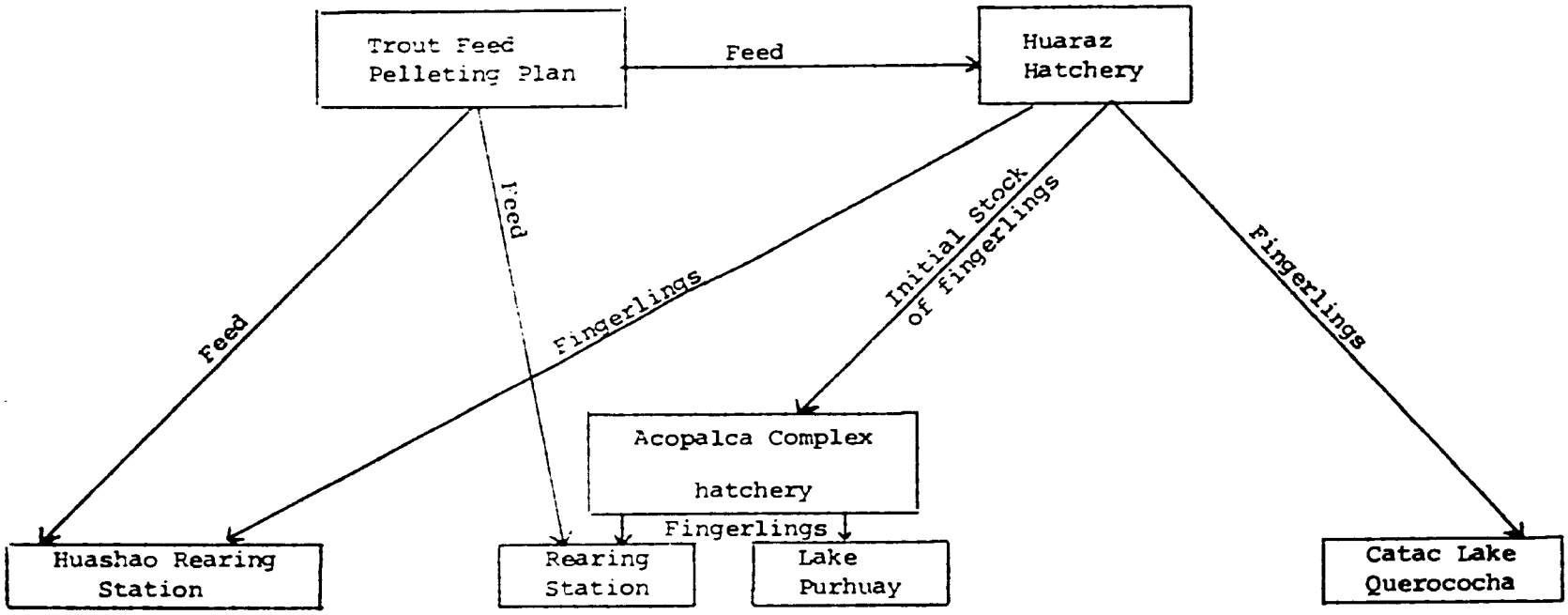
TABLE I-C-1

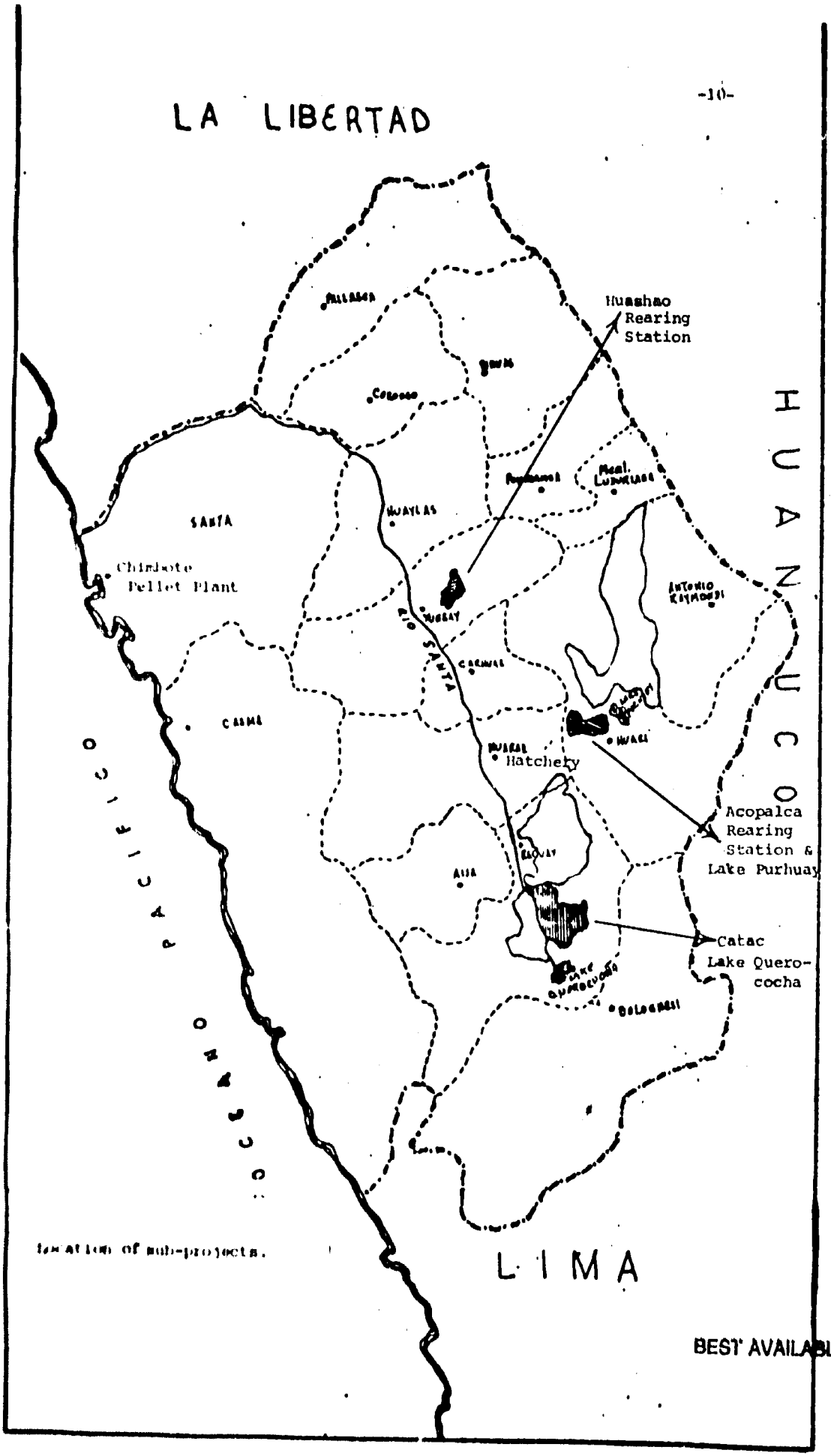
Summary of Sub-project Data

	Sub-project	Size	Capacity	Annual Production
1.	Pelleting Plant	NA	1 MT/day	360 MT
2.	Huaraz Hatchery	NA	2 million fingerlings	2 million fingerlings
3.	Huashao Fish Farm	10 raceways	100,000	36,000 Kg.
4.	Acopalca Complex			
	a. Rearing Station	12 raceways	100,000 fingerlings	36,000 Kg.
	b. Lake Purhuay	86 hectares	90,000 fingerlings	10,800 Kg.
5.	Lake Querococha	143 hectares	120,000 fingerlings	10,800 Kg.

CHART I-C1

Sub-Project Interrelationships





location of sub-projects.

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Part III-B-3 contains projections of the proposed project's secondary benefits and potential for replication. The estimated B/C ratio of utilizing the surplus feed produced by the project's pellet plant is 1.36. It is believed that this surplus will supply six non-project fish farms. A feed/flesh ratio of 2:1 was utilized.

The B/C ratio of a complete project replication is 1.03. Replication in this instance is based on the construction of a new pellet plant identical to the pilot project plant, expansion of the Huaraz hatchery and the complete construction of 9 new fish farms for which no investment has yet taken place. This B/C should be considered conservative since expansion to the existing pellet plant, involving some economies of scale, would likely substitute for construction of a new unit. Furthermore, expansion of the hatchery will not likely be required in the near-medium term.

An attempt was also made to project the financial/cash significance of a feed/flesh ratio of 2:1 to the potential universe of beneficiaries in Ancash based on the total 19 non-project fish farms now in operation, under construction and in the project stage. It is estimated that at full production additional income of $11.41 per capita would be available to approximately 13,000 people annually.

The proposed project has been jointly elaborated by the USAID and GOP personnel from the Ministry of Fisheries. Dr. Harold Hagen of Colorado State University served as technical consultant to the USAID for project analyses. Contributions for the economic and financial analyses were provided by Dr. J. Hugh Winn, also of Colorado State University. A marketing analyses was undertaken for the project by Julio Vargas Prada, Director of Operations, Sistemas y Organización, S.A. The sociological analysis of the participating communities was conducted by Dr. Luis Soberón of the Catholic University of Lima. Members of the USAID project committee included:

Leonard Yaeger, Assistant Director
Milton Lau, Rural Development Officer
Jorge Cossio, Agricultural Economist
Wendy Stickel, Assistant Capital Project Officer
Gerald F. Gower, Program Officer
Louis Macary, Deputy Program Officer
Robert Adler, Mission Economist

D. Summary Findings

Technical analysis of the inland fishery resources of Ancash, where the demonstration project will be executed, has indicated a low density of both species and numbers of fish. Chemical, biological and physical features of the lakes and river waters favor the production of trout. Trout are also capable of high density artificial propagation.

The failure of Peru to maximize trout production in the past has been assessed as due primarily to the lack of a standardized feed ration that provides for the particular nutritive requirements of trout. Syndromes of poor growth, low egg production and quality, and high mortality of young fish appear in Ancash trout rearing stations as they do in all of Peru.

All of the basic ingredients needed to form a standardized complete trout diet are available in Peru at reasonable cost. Success of any program to increase fish production in commercial quantities is dependent upon the development and production of a low cost, highly nutritious diet coupled with a training program designed to demonstrate modern culture techniques using the dry pellet diet. Facilities for trout rearing in Ancash are generally adequate for increased production provided that some minor modifications in hatchery design are made. Trained GOP personnel are available and fully informed as to the needs of the new program and are in full agreement with the technical design of the project.

Given the ready availability of water suitable for trout production, an existing GOP fisheries infrastructure in the project area, the expressed interest of rural communities to engage in trout production, and the availability of necessary ingredients at reasonable cost for a balanced feed appropriate for trout, the proposed project has been determined to be technically feasible.

Economic analyses were computed separately for each of the five sub-projects. Each results in a benefit/cost ratio of 1 or greater. The B/C ratios of the feed pelleting plant and the hatchery were maintained at an equilibrium of 1 by holding prices of feed and fingerlings at slightly above the break-even point in keeping with the intended service nature of these two GOP operated entities and in order to maximize the benefits accruing to the target groups. Internal rates of return were also computed for each of the three community enterprises. Returns of 19.1, 27.6, and greater than 50 were computed for these three projects. The project thus meets or exceeds standard economic feasibility criteria.

Financial analyses of each of the five sub-projects indicate that all of the sub-projects are viable. Revenues from sales cover recurrent and replacement costs in all of the sub-projects beginning no later than the fourth year. Financing required from the GOP in the initial years as a cash contribution is $40,900; all for the government-owned trout feed plant and fish hatchery. The total project contribution of the GOP is approximately $385,000, including personnel and installations of the Huaraz hatchery, technical and administrative personnel inputs of the Regional Fisheries Office, vehicles, etc. While the two government operations are self-financing, they will not earn a profit. All profits will be passed on to the communities in the form of lower prices for feed and fingerlings. The trout production operations of the communities, on the other hand, are highly profitable and will provide a significant and increasing net income for distribution to community members, expansion of operations, or investment in new activities.

Based on the detailed discussions of project analyses contained in Part III and of implementation planning contained in Part IV, it is the conclusion of the Mission that the project is technically sound and economically and financially feasible and that the project is ready for implementation. The project meets all applicable statutory criteria, as indicated in the Statutory Checklist, Annex H. An Initial Environmental Examination was undertaken for the project. The IEE discerned no likely probabilities for significant negative impacts on the human or natural environments and recommends a negative determination. The IEE is attached as Annex I.

II. Project Background and Detailed Description

A. Background:

1. The Sierra Setting:

Almost 50% of Peru's total population is located in the Sierra. Major characteristics of the Sierra population are underemployment, extremely low income levels, low productivity and low nutritional levels. (See Annex A for analysis of nutritional status.) Only 11.1% of the total land area is suitable for cropping with a substantial portion of even this land surface limited in terms of agricultural potential by its moderate to steep slopes. Agricultural production increases are also made difficult by the farmers' unfamiliarity with basic inputs such as fertilizers, pesticides and improved seed, and varying temperature in the higher mountain valleys.

The GOP with A.I.D. and other donor support is making an effort to increase agricultural productivity and expand opportunities for the Sierra inhabitants through innovative small farm irrigation programs, programs aimed at increased production of corn, other crops and livestock, and other similar programs. Nevertheless, other alternatives are urgently needed to supplement these efforts if the goal of increased productivity, incomes and employment and improved nutrition are to be realized by the Sierra poor.

2. Fisheries Development in Peru:

In the Sierra countless small and large rivers emerge from the mountain area and there are scores of natural lakes and many sites unsuitable for agriculture where water could be impounded. These large quantities of water are inhabited only by a very few species of native fish. Chief among them is a small catfish (suche) which grows slowly, is difficult to catch and seldom congregates in numbers large enough to establish a viable fishery. Pejerrey (a member of the Mackeral family) have been introduced in some sections, but are very limited in number and distribution. Fresh water shrimp thrive in the lower reaches of the Sierra but seldom reach the higher more densely populated sectors.

Because the waters of the Sierra are suitable for trout, several species of that family have been introduced in recent decades. The GOP began to participate in the systematic production of trout in 1936 through the establishment of the

first reported hatchery (Chucuito, Puno). From 1930 through 1972, the GOP established 5 additional hatcheries in the Sierra, 5 on the coast and 4 in the jungle (the latter are producing warm water tropical species, principally Tilapia). These hatcheries have been producing fingerlings and stocking lakes. Success has been only partial due to many management related problems, especially overfishing in some areas. In addition, the attempts to establish a series of fish farms, both private and governmental, have exceeded the technological level currently available in the country.

The major problem, however, has been a failure to prepare low-cost diets of a nutritional level suitable for trout. Diets have been prepared locally using whatever ingredients were available, without sufficient attention to nutritive content. Often such feed has not been available for several days at a time. The net result has been a program characterized by good water supply, generally well-engineered and constructed facilities, but inadequate diets and culture techniques resulting in limited production and reduced incomes.

Paradoxically, a major ingredient of the commercial trout diet used throughout the world is fish meal derived from the Peruvian anchovy. This small fish, which abounds in the cool waters of the Humboldt Current, provides a major source of foreign revenues for the nation. Although the anchovy population has been overfished in the past and is very sensitive to changes in the ocean environment it has a built-in flexibility of high fecundity and short life span that should assure its continued availability. Peru has now established strict seasonal controls to protect this resource. There should be more than sufficient fish meal available for both export and incorporation into the diet mix required for trout, as only a minute amount of the catch even in lean years would be required for this latter purpose and the value of the trout produced would be much greater than that of the fish meal used as a feed ingredient. Other products used in trout diets (wheat middlings, rice hulls, cotton seed, meat by-products, distillers dry solubles, etc.) are all available in country. Vitamin pre-mix and mineral components are available from pharmaceutical supply houses and would not have to be imported.

The major problem presently limiting trout production thus seems both identifiable and capable of quick and inexpensive solution, and other problems such as fish farm management and genetic improvement of the trout stock can also be addressed through technical assistance.

It should be noted that until 1969, when the Ministry of Fisheries was created, no comprehensive GOP fresh water fisheries policy existed. Since its establishment, the Ministry has been working to organize a nation-wide administrative structure which will permit rational management of all water resources in Peru. The USAID believes that the appropriate GOP institutional and policy infrastructure now exists for the development of a replicable project in fresh water fisheries.

3. Development of the Proposal:

Since 1967, A.I.D. has assisted in the financing of several studies in the fresh-water fisheries sector. The most relevant are:

(a) E.W. Shell of Auburn University completed a report on the "Status of Trout Culture in Peru" in August, 1971. The purpose of the survey was to evaluate the potential for trout farming in Peru and to evaluate certain aspects of the Ministry of Fisheries' proposed program for the development of the trout-farm industry.

(b) A study by W.D. Davies and W.L. Shelton from Auburn University (AID/csd-2270) during September, 1974, provided the Ministry of Fisheries with recommendations for a research and development program for subsequent stocking, management and harvesting of fish for lakes in the Central and Southern Sierra regions. Based on a survey of seven representative highland lakes and application of relevant productivity indices, favorable levels of yield were projected, indicating that the biological potential of many natural waterways appeared sufficient to support development of commercial trout fisheries. (As indicated in Part III, it is the judgement of the U.S. Fisheries Consultant engaged to assist in the analyses for this project paper that a separate, prior research and development program is not essential, that minimum lake stocking capacities may be computed with reasonable degrees of assurance, and that optimal stocking levels may be determined through limnological and other studies conducted in the course of the proposed action program.)

Based on the above and other information, the USAID prepared a preliminary project proposal in February 1975 for a $477,000 TA grant to finance primarily biological and economic research for testing the economic and technical production feasibility of trout and other species in natural lakes (stocking) and in trout farms in the Sierra; establishment of a production and testing unit to produce fingerlings; and development of a

pilot commercial processing and marketing facility capable of producing trout for export markets as well as trout and other species for domestic consumption.

During informal review of the preliminary proposal with AID/W, questions arose concerning the concentration on trout vs. native species, given the apparent high sales price of trout and the possibility that such project emphasis would not serve the best nutritional interest of the rural poor.

In subsequent conversations with the Ministry of Fisheries, a revised proposal was discussed which would emphasize native species (pejerrey and suche) in four selected lakes in the Ancash province. The USAID requested the technical assistance of Dr. Harold H. Hagen of Colorado State University in July/September 1976 to make a technical evaluation of the proposal and the selected area.

Dr. Hagen's study revealed the chances of failure were greater than 50% if so called "native species" were used in the proposed project. In contrast, a high probability of success could be expected if trout were to be utilized in the project, provided that appropriate attention was given to the feed component. Consequently project emphasis has been redirected to a trout program.

The major factors resulting in this decision to emphasize trout, rather than "native species", were:

(a) the conclusive identification of the reasons for moderate to poor quality, high cost trout production in the past and the identification of a cost efficient and readily available solution to this problem;

(b) the much greater experience with trout culture on the part of the GOP and Peruvian communities; and the difficulty in having communities shift to less known species when substantial experience with and acceptability of trout exists;

(c) the characteristics of mountain waters where suggested "native" fish are not in fact native or common, but which are ideally suited to trout;

(d) the fact that trout facilities already exist and proven technology is readily adaptable; therefore, the

ability to immediately initiate production rather than waiting for the results of a research program based on "native species;"

(e) the vast amount of reliable data available on trout culture, including a basic economic evaluation showing high conversion potential of low cost food items not suitable for human consumption into high quality, high protein food trout for local use, barter or sale;

(f) the greater potential for replication in other areas of the Peruvian Sierra where similar experience with and knowledge about trout exist;

(g) greater stock of existing knowledge concerning trout production which is readily adaptable for training programs involving laymen and GOP personnel;

(h) greater potential for harvest in lakes due to accumulated knowledge of life histories of trout vs. "native species".

B. Detailed Description: 1/

1. Goal: The goal of USAID agriculture programs in Peru is to increase productivity, incomes and employment and improve nutrition among the rural poor. The proposed Fresh Water Fisheries project will contribute to that goal by increasing the income of small farmer groups in the Peruvian highland via introduction and addition of commercial trout fish farming to their regular agricultural activity. It is expected that the nutrition of the rural poor will also be improved through progressive introduction of trout into their diet.

Underlying assumptions for this goal are that the GOP will not relax or modify its current policy of giving top priority to increased production of food and that the GOP will continue priority support of programs for improvement of conditions and opportunities for small farmers.

2. Purpose: The purpose of the project is two-fold. First, to demonstrate that intensive production of trout in fish farms is technically, economically and financially viable, thus providing an alternative source of additional income to Sierra subsistence farmers. The project will achieve this

1/ Refer to Logical Framework in Annex C.

purpose via improvement, completion and/or expansion of a feed pelleting plant in Chimbote, one hatchery in Huaraz and two community fish farms in Huashao and Acopalca. Second, to demonstrate that extensive production of trout in natural lakes is a practical and viable activity offering small farmers an additional source of income and low cost animal protein. This second purpose will be achieved via stocking of lakes Querococha and Purhuay with fingerlings produced in the hatcheries of Huaraz and Acopalca respectively.

3. Outputs: There will be 6 major outputs.

a) Trout feed pelleting plant: An experimental pelleting plant (1 MT per day) will be established in the coastal city of Chimbote to assure a regular supply of recommended feed rations delivered to sub-projects located in Huaraz, Huashao and Acopalca.

Recommended feed ingredients available in Chimbote and neighboring areas are fishmeal, cotton seed meal, grain by-products, yeast and distillers dry soluble products, chicken feathers, offals, etc. Fishmeal is the basic ingredient. More than 50% of the total feed ration is composed of fishmeal. The exact proportion will be adjusted in accordance with recommendations of a U.S. nutrition specialist who is scheduled to provide advice during establishment and initial operation of the plant.

Recommended feed formulas of different types and pellet sizes will be produced to reflect different growth stages of trout. These will be delivered in the appropriate amounts and time to sub-project sites following the biological growth trend of trout produced.

A regular feed quality control program will be included for assuring a target feed-to-meat conversion ratio of 2 to 1 compared to the present ratio approximating 4 - 5 to 1.

b) Huaraz hatchery: An existing MinFish hatchery in Huaraz will be upgraded through renovations of the brood fish holding area. New sources of eggs and/or fingerlings for genetic improvement will be imported from the U.S.

Additional improvements include construction of a covered water delivery system for the hatchery and installation of a filter for the egg and fry incubation rooms. Also feed storage facilities will be improved to insure moisture resistance

and rodent free storage. Feed storage capacity will also be expanded from 2 to 5 MT per month and additional feed bins will be constructed.

With modifications planned under the project the hatchery will have a capacity for producing 2 million ova per year. Currently the hatchery produces an average of 500,000 - 600,000 fingerlings, with a mortaility rate of approximately 20%. Of the planned production approximately 200,000 genetically improved fingerlings will be sold to the fish farm at Huashao, and 120,000 to the community of Catac for stocking of Lake Querococha. Genetically improved stock will also be produced for the Acopalca hatchery. The balance of the production of the Huaraz hatchery will be available for purchase by other fish farms in the region.

c) Community Operated Fish Farms (Rearing Stations):

(i) Huashao fish farm:

The existing infrastructure of 10 raceways will be completed with construction of a ditch to the inlet stream, screens, feed bins, feed storage facilities, and a small facility for preparing and shipping fish to market. It will operate in accordance with technical recommendations provided by the Regional Fisheries Office.

The administration of the fish farm will be by the Farmer Community of Huashao. At full operation after project year two it is expected to produce 36,000 Kg. of market size trout per year from an annual stock of approximately 200,000 fingerlings. The initial stocking will be 100,000 fingerlings.

(ii) Acopalca fish farm:

Presently Acopalca has a small fish farm composed of 7 raceways, a storage facility and an office. It also operates its own hatchery.

The existing infrastructure will be expanded via construction of twelve new raceways, a pond area at the lower end of the hatchery for brood stock development and spawning pens, a feed storage room, feed bins and a facility for fish processing and shipping. Brood stocks will be upgraded through import of high genetic quality ova and/or fingerlings.

Administration of the expanded and improved fish farm will continue to be by the Community of Acopalca. At full operation the new installations are also expected to produce after project year two 36,000 Kg. of market fish per year from a semi-annual stocking of 90,000 - 100,000 fingerlings produced in the hatchery unit.

d) Two Newly Stocked Lakes:

(i) Lake Querococha:

This sub-project will be managed by the Farmer Community of Catac. The lake will be stocked with 100,000 - 120,000 improved fingerlings purchased from the Huaraz hatchery. It will produce approximately 5,000 fish or approximately 900 Kg. per month beginning in project year two (approximate fish size is assumed to be 10 inches, with 5.5 fish weighing 1 Kilogram). Planned facilities include a small dock, a small fish processing facility, a boat, nylon gill nets, ice chests and a guard house.

It is expected that up to 80% of the monthly output, or 720 Kg. of fresh fish, will be consumed locally by the 270 families in Catac (2.7 Kg./family/month). The MinFish will sponsor and organize a promotional campaign among the project groups to stimulate increased consumption of trout. This campaign includes four-day courses offered to school teachers, two-day courses offered to households, radio programs and practical demonstrations. This promotional program is already operational and will be expanded and facilitated through the availability of a vehicle provided under the project. Fresh trout will be sold to beneficiaries at a proposed low price of 30 Soles or US$0.46 per Kg. to promote increased consumption.

The Community members will also have the alternative of selling trout to non-beneficiaries at market prices. It is expected that a portion of the monthly output will be smoked and salt-dried for this purpose. The appropriate intermediate technology, recommended production volumes and costs will be developed with the technical input of a US specialist programmed during the first year of the project. The MinFish will provide selected farmers from Huashao, Catac and Acopalca with periodic short-term training in fish processing.

(ii) Lake Purhuay:

Lake Purhuay forms a part of the Acopalca fish complex. The lake will be stocked initially with 90,000 -

100,000 fingerlings from the hatchery at Acopalca. It will produce approximately 5,000 fish or 900 Kg. per month (5.5 fish per Kg.) beginning in project year two. Planned facilities include an improved roadway from Acopalca to Purhuay, a fish processing facility, a small dock, a boat, nets and ice chests.

Consumption of lake trout and processing plans are similar to those of Lake Querococha.

With respect to actual production potential of both lakes it is planned that the MinFish biologists will routinely collect data on the physical, chemical and biological conditions found in the lakes during each visit. Accumulated data will eventually form a good picture of lake dynamics and their optimum ability to produce trout. Prior, detailed limnological investigations were not considered necessary by the USAID's technical consultant for this purpose as minimum stocking capacities were readily calculable.

4. Inputs:

(a) AID contribution:

(i) Technical Assistance: AID will provide a total of 33 weeks of Technical Assistance in seven specialties during the first thirty months of the project. These specialties are fish culture, fish nutrition and diseases, fish biology, fish processing, lake fisheries biology and management, business administration, and fish marketing. It is anticipated that some technicians will be able to cover more than one specialty. The U.S. technicians will directly advise MinFish personnel on the operation of the feed pelleting plant and the Huaraz hatchery and will also conduct in-country short training courses for both MinFish personnel and technical and management personnel from the community fish farms. They will also make periodic evaluations of each sub-project and recommend adjustments or improvements. A schedule of planned technical assistance is found in Table II-1. Estimated total cost of TA is $82,500.

(ii) Training: A US$70,000 training program including 48 months of long-term academic training (2 M.S. degrees) in the U.S. and 8 months of short-term training in the U.S. and/or third countries will be offered to selected MinFish technicians during the life of the project. This training is designed both to directly support project elements and to lay the ground work

for potential replicability in other regions of the Sierra. Major areas of training are fish culture and biology.

Short-term training will be provided in-country for approximately 20 project and non-project MinFish technicians. Non-project participants from other MinFish field offices will be prepared via this training for assuming specific training and technical tasks for replication of the project in other regions of the country.

Trained project MinFish technicians will in turn offer an improved training program to project farmers covering the above mentioned areas in support of successful project implementation. Approximately 25 - 30 participants will be selected for each course from member farmers of the associative groups of Huashao, Catac and Acopalca. Each course will take from 8 to 10 days.

(iii) Commodities: Various imported items of equipment, materials and vehicles will be financed by AID. These include, processing equipment for the feed pelleting plant, one truck, and minimal office equipment. Commodities for the Huaraz hatchery include laboratory equipment, intake filters, incubators, one truck and imported ovas. Boats and nets will be provided for the two lake sub-projects. A vehicle for the promotion of trout consumption will be provided to the Regional Fisheries Office.

(iv) Other Costs: Included for AID financing under this category are such costs as installation of the feed pelleting plant, improvement to intake canals at the Huaraz hatchery including installation of filters, renovation of brood area at the hatchery, expansion of raceways at Huashao and Acopalca and minor improvements to lake access roadways. In addition, certain initial production costs will be defrayed, particularly those of the feed pelleting plant, and particularly relative to the first year of operations.

(b) GOP and Local Inputs:

The project contribution of the Ministry of Fisheries will include both administrative and technical personnel (including four technicians full time from the Regional Fisheries Office), land for the feed pelleting plant, the existing installations of the Huaraz hatchery, vehicles, office equipment and cash towards the costs of the new installations at Huaraz and the initial operations of the feed

pelleting plant. The value of the GOP contribution is estimated in excess of $385,000, or approximately 45% of the total project cost. In addition the participating communities will donate land, existing facilities, and labor for the execution of the projects.

TABLE II-1 DISTRIBUTION OF TOTAL US TECHNICAL ASSISTANCE IN SEVEN SPECIALITIES DURING FIRST THIRTY MONTHS OF PROJECT (IN WEEKS PER SPECIALTY) 1/

Specialty	Project year/month																												Total Weeks
	Year One												Year Two																
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	
1. Fish Culture 2/				(x)				(x)				(x)						(x)											(x)		5
2. Fish Nutrition & Diseases		(x)		2(x)				(x)				(x)						(x)								(x)					7
3. Fish Biology				(x)				(x)										(x)											(x)		4
4. Fish Processing				(x)									2(x)					(x)													4
5. Lake Biology & Management				(x)								(x)						(x)						(x)							4
6. Business administration and accounting				(x)						(x)								(x)								(x)			(x)		5
7. Fish marketing and cost analysis				(x)						(x)										(x)									(x)		4
TOTAL WEEKS:																															33 3/

(x) One Week; 2(x) Two Weeks.

1/ It is anticipated that some technicians will be able to cover more than one Specialty.

2/ This Specialist will also serve as TA Coordinator.

3/ Estimated total cost US$82,500.

III. Project Analysis

A. Technical Analysis

1. Trout Pelleting Plant

The trout's diet is the most critical element in the efficient production of this specie. The proper balance of carbohydrates, fats, and proteins must be uniformly controlled to maintain growth from ova to adults. Making trout rations with equipment used for other animal feeds brings the constant risk of an inferior product. Dr. Hagen, in his analysis of trout production deterrents, gave priority recommendation to the establishment of a pelleting plant that could insure the balanced nutrition necessary for the pilot project. This in turn will reduce the feed to meat conversion ratio from the present 4-5/1 to 2/1.

The projected plant in Chimbote will be pilot size (manually operated) with the capacity of being expanded as needed. The use of man-power rather than automated equipment is fully justified in Peru. Simple, manually operated equipment is still capable of ensuring reasonable quality control. In addition, it can be maintained at low cost and operated by semi-skilled workers.

Pesca-Peru is currently vacating a portion of its Chimbote installations and has offered this space as a site for the pelleting plant. The Region II headquarters of the Ministry of Fisheries intends to move its offices and equipment into this compound as well. The site has several advantages: (a) the compound is fenced, lighted and will be constantly guarded, (b) water and electricity are available, (c) the expansive concrete floor will make it possible to erect a pre-fabricated building at minimal cost and offers room for growth if and when needed, (d) the site is within a few hundred meters of a major fish meal plant, (e) quality control laboratory facilities of Pesca-Peru are within two blocks of the site, and (f) by being in the same compound as Region II headquarters, communications related to production needs can be quickly handled.

By-products, which can be incorporated into a good trout ration are available from several sources in Chimbote and/or Trujillo, about 100 miles away . A major flour mill in the area will have an ample supply of grain by-products. Local slaughtering houses currently do not utilize blood and other important by-products, and a brewery in Trujillo will have a source of yeast and distillers dry soluble products as needed. Thus there appears to be no problem in obtaining all needed ingredients for a good trout ration.

2. Huaraz Hatchery

Due to its convenient location the existing hatchery at Huaraz will be designated as an egg producing and fingerling rearing

unit for the western slope of the Andes, with only a secondary role in adult trout production. Availability of extra land and water and the minor costs required in pollution control for the egg production unit were the main factors in this determination. The facility is managed by the Regional Fisheries office, and has a trained staff. With physical improvements introduced under the project it will have a production capacity of 2 million fingerlings per year. Genetically improved species of trout will be imported under the project for testing and reproduction. The hatchery will supply the annual fingerling stocking requirements for the Huashao rearing station and Lake Querococha sub-projects as well as an initial supply of genetically improved fingerlings to Acopalca. Fingerling production in excess of sub-project requirements will be readily absorbed by other fish farms currently in operation or under construction. Huaraz will also serve as a center for the introduction of the balanced feed to be introduced under the project both among sub-projects and other fish farms. One project vehicle (a truck) will be provided to the hatchery for distribution of fingerlings and other transportation requirements.

3. The Acopalca Fish Farm

The hatchery and rearing station of Acopalca will serve as the basic counterpart of Huaraz on the Eastern slope of the Andes. Its good water supply and the availability of land for expansion make it an excellent choice. The limited amount of rearing capacity in existing raceways is the major limitation at present. The fish farm was established with the cooperation of CARITAS and municipal authorities and is administered by the Farmer Community of Acopalca.

In order to produce revenue for recurring costs and contemplated expansion, the Acopalca station will give priority to maximum production of marketable fish, with second priority given to fingerling production. Existing raceways can accomodate brood fish for the production of approximately 1.5 million fry. If these fry were carried through the complete cycle to optimum sized saleable fish (5.5 per Kg.), approximately 82,000 Kg. could be produced. The amount of water needed for this activity would be about 18 CFS (8,100 gal/min.), which is within existing availabilities. However, expansion of raceways to accommodate this volume of production is not projected for the first few years. A project goal of 36,000 Kgs. per annum has been established based on one new battery of 12 raceways. Excess fingerlings will be marketed to nearby communities where there are lakes suitable for stocking. Approximately 100,000 fingerlings will be retained for stocking of Lake Purhuay.

4. The Huashao Fish Farm

The facilities at Huashao presently contain 10 raceways with a water intake of about 6 CFS. The facilities will be completed and become operational under the project. Community members who will be technically and administratively responsible for the project have already received basic training by the Regional Fisheries Office and will be further up-graded by training provided under the project. The rearing station will be stocked initially with 100,000 fingerlings, increasing to 200,000 over the life of the project. Production based on the initial stocking cycle is expected to reach 25,000 Kgs., increasing to 36,000 Kgs. over the life of the project.

Technical notes relative to Fish Farm Operations

a. It is assumed that market sized trout will be attained in no less than 12 and likely no more than 18 months. This assumption is based upon average annual temperatures and expected feed conversion rates of the trout. All trout produced by the rearing stations will be marketed through EPSEP.

b. The problem of both overfeeding and underfeeding will be constantly evaluated in view of past experience in developing countries. Calculations of the percent of food to body weight to be fed each day according to temperature are easily translated into chart form. It will be necessary at first to have trained GOP personnel to make a monthly inventory at each station. They will then determine the volume of feed utilized in each raceway and mark the level of feed in each feeding container. In time, the hatchery personnel will be able to judge feeding requirements by observing the fish (how fast the food is taken, if there is any residue on the bottom, etc.). Cleaning of raceways, care of screens, sanitary procedures to prevent disease, simple disease detection and other aspects will be covered in detail in training programs.

c. Although it has been determined that current pollution from rearing stations will be negligible and no special control devices are needed, future expansion at any or all facilities could produce an organic load of suspended solids (fecal waste) that could pose some problems downstream. At each station the location of a settling basin (pond) will be determined so that if in future times pollution control is needed, the plan can be easily implemented.

5. Lake Purhuay

Lake Purhuay will be technically and administratively managed by the farmer community of Acopalca. The lake has a surface area of 86 hectares. The initial stocking is based on an evaluation which indicates a level of 80 to 90,000 fingerlings as a minimally technical stocking level. The factor computation is 900 fingerlings per surface hectare of lake. For stocking purposes the mortality of these fingerlings has been estimated at 20 percent.

Lake Purhuay is located close to the Acopalca hatchery and will be visited and checked frequently for biological data. A guard will be posted at the lake to discourage poaching. The lake currently has a population of trout but data on numbers and condition are not available. GOP personnel will initiate under the project an investigation to determine these data as well as the reproductive potentials in the inlet stream.

Harvesting of trout from lake Purhuay is planned to be accomplished using gill nets. If this method is not satisfactory in harvesting the trout at the proper size and age, other methods such as trap nets will be used. Because the size and number of fish will be variable, it is anticipated that these fish will be reserved for local consumption and will not be sold in markets where a more uniform size is required. Production of 900 Kgs. of trout per month is projected. It is anticipated that smoking and drying will be used on at least part of the catch. Appropriate technology for their preservation will be demonstrated in the training programs.

6. Lake Querococha

Lake Querococha will be technically and administratively managed by the farmer community of Catac. The lake has a surface area of 143 hectares. The general program outlined for Lake Purhuay will apply also to Lake Querococha with a few adjustments. Because this lake is at a slightly higher elevation, it will be stocked with a slightly smaller number of fingerling trout per surface hectare until the project determines how much productivity can be optimumly achieved.

Technical Note Relative to Lake Stocking Levels

An alternative method of establishing probable lake production capacity would be to undertake prior, detailed (and

expensive) biological and limnological studies of the lakes. The USAID's technical advisor recommended against this approach. In his judgement there existed sufficient evidence of the presence of spawning populations in both lakes to establish their suitability for trout and thus to permit computation of conservative stocking potentials. Under the project systematic growth and harvest evaluations will be undertaken of the two lakes by GOP fisheries technicians in conjunction with the community authorities to develop the necessary data to establish the optimum levels of trout stocking and production. U.S. technical specialists will assist the Regional Fisheries Office in designing these evaluations and will participate in the execution of the initial surveys.

B. Economic Analysis

1. Analytical Method

For the purpose of this analysis sub-projects have been classified into two groups -- those which will operate as public sector entities and those which will be operated by the private sector. The first group consists of the feed pelleting plant and the Huaraz hatchery sub-projects which will be operated as GOP public service enterprises. The second group includes the Huashao rearing station, Lake Querococha and the Acopalca rearing station and Lake Purhuay complex which fall within the private sector.

This dichotomy arises because of the different economic performance characteristics and objectives inherent in the two sectors. Private sector sub-projects will basically be analyzed in terms of their profit maximizing input-output structure. The two sub-projects to be administered by the Ministry of Fisheries are not designed to maximize profits but rather to make their products available to community enterprises at minimum costs, i.e. at the cost of production.

Below is a description of the economic decision criteria and the basic assumptions considered in the analysis.

(a) Decision Criteria:

The internal rate of return (IRR) and benefit-cost ratio (B/C) computations applied algorythms to the cash-flows of individual sub-project investments to determine their economic viability. Emphasis is on the IRR as the most appropriate economic indicator for evaluating performance of three sub-projects in the private sector. Alternatively the B/C ratio is considered the best measure of social benefit for the two sub-projects administered by the Ministy of Fisheries.

A target rate of 15% was used for measuring the economic efficiency of all the sub-projects and their components. When sub-project activities were purely economic in nature -- i.e. private sector -- their inclusion was dependent on exceeding this minimum acceptable rate of return.

A discount rate of 15% was used to obtain the present worth of future costs and benefits in connection with IRR calculations. Total costs considered include capital, maintenance and operation, and production costs. Benefits considered are those derived from the sale of fresh trout produced in fish farms and lakes. Economic acceptability of sub-projects is dependent upon a benefit-cost ratio greater than one.

(b) Assumptions:

(i) Analysis Period:

A sub-project life of 25 years was assumed for investments in fish farms and hatcheries and of 10 years for investments in the feed plant and Lake Querococha. The longer-life infrastructure works considered by this project are of simple design and do not require highly sophisticated engineering practices and materials implying depreciation periods larger than 10 or 25 years respectively.

(ii) Rate of Development:

Technical analysis of project productivity in correlation to the existing state of art and learning capacity of project participants indicate that target outputs can be achieved by the third or fourth year depending upon the sub-project considered. Thus the pelleting plant and Lake Querococha sub-projects are expected to operate at maximum capacity by the third year, and the remaining three sub-projects by the fourth year. Huashao and Acopalca sub-projects are expected to operate with a target feed-to-meat conversion ratio of 2 to 1 by the fourth year.

Investment works, imports and installation of capital goods are planned to occur during project year one. Any unforeseeable circumstance is not expected to delay implementation of investment actions beyond the second year at any rate.

(iii) Price Adjustments:

Shadow prices have been calculated for the outputs of the Pellet Plant, Huaraz Hatchery, Lake Querococha and Lake Purhuay and are considered throughout the economic analysis of the sub-projects in order to reflect actual economic output values. A shadow price of US$306 per metric ton of trout feed from the Pellet Plant (compared to a current market price of SU$277 per metric ton) was derived.1/ For the fingerlings produced at the Huaraz Hatchery, a shadow price of $12.70 per kg. 2/ has been assumed (compared to the market price of $11.00), and US$1.23 per kg. of the lake trout produced at Querococha and Purhuay (compared to the proposed selling price of

1/ The shadow price was derived by dividing the discounted (at 15%) total cost of producing pelletsover the discounted volume of pellets produced during years one through 25. Discounting of pellet outputs valued at this price results in a B/C ratio of 1.00, i.e. it is at this price that the business operates at cost.

2/ The same methodology outlined above was used to derive the shadow price of fingerlings.

UF$0.46). The differences between the proposed selling prices and shadow prices is assumed as an indirect subsidy by the GOP to producers.

(iv) Inflation:

It is assumed that the price-cost value interrelationship will not vary significantly in the future, i.e., that changes in future costs will be followed by proportional changes in future market values or that inflationary trends will affect in the same proportion both costs and benefits of the project.

2. Economic Results

Costs and benefits of individual sub-projects were aggregated and discounted at the rate of 15% to determine social benefits of the overall project. The outcome is a B/C ratio of 1.1 (See Table III-B-1 and Annex E). The overall result is derived from analysis of individual sub-projects as follows:

(a) Pellet Plant Sub-Project:

Economic analysis of this sub-project shows a B/C of 1.00. Accordingly the plant would be operating at economic equilibrium assuming outputs were sold at a shadow price of US$306 per metric ton. The pellet plant has been conceived in principle as a non-profit operation. Its basic objective is to do applied research work in fish nutrition utilizing ingredients generally available in the country. At the same time improved feed outputs would be supplied at cost to related sub-projects. Research results of this pilot plant are ultimately related to their replicability in other sierra regions of Peru.

The plant is expected to reach full capacity operation by the third year producing 360 MT at an annual total cost of US$94,745. Sale of feeds at US$306 per MT would yield an annual gross revenue of US$110,160. Actual value of sales at planned price of $277 per MT will be $99,720.

(b) Huaraz Hatchery sub-project:

The economic result of this hatchery is a B/C ratio of 1.00. It would operate at economic cost assuming improved fingerlings were sold at the shadow price of US$12.70 per Kg. Non-profit operation of this unit is consistent with its intended public service extension and promotional activities.

A capital investment of US$56,286 during year one is included in the shadow price calculation. Full operation is expected to occur by year four at which time 4,318 Kg. of fingerlings will be produced at an annual total cost of US$42,800; annual gross sales value

would amount to US$54,839 at the shadow price of $12.70 per Kg. Actual revenues will be $47,498.

Costs reductions are expected to occur principally via genetic improvement of ova and reduction of the currently high (20%) mortality rate of ova as well as fingerlings. Approximately 75% of total capital investment contributes to this end, viz., import of ova, filter for ova room, insulated transportation tank, etc.

(c) Huashao Fish Farm Sub-Project:

This private sector unit has a B/C ratio of 1.04 and an IRR of 19.1%. These results are due principally to (1) projected reduction of the current feed-to-meat conversion ratio of 4-5/1 to 2/1 and (2) utilization of improved fingerlings. Improved management and production practices are also expected to contribute their share to the good economic performance anticipated.

A target conversion ratio of 2 to 1 will be achieved by year four at which time Huashao will produce 36 MT of trout annually with an input of 72 MT of feed rations. Full operation will result in annual gross costs of US$33,263 and gross returns will be US$44,280 annually.

A total of US$9,250 will be invested in Huashao for completing construction of planned fish farm infrastructure. Fencing of the unit is contemplated at a cost of US$400, and an electricity generator costing US$2,000 will be included for assuring efficient operations during the night. Also US$3,000 will be provided for accounting equipment.

(d) Lake Querococha Sub-Project:

Economic analysis of this operation results in a B/C ratio of 1.51 and an IRR larger than 50%. It needs to purchase only 273 Kg. of fingerlings the first year and 125 Kg. annually thereafter at US$3,467 and US$1,375 respectively. No feeds are required. Lake trout feed on natural lake microorganisms.

Beginning in the second year this enterprise will produce 10.8 MT of trout per year at a total cost of US$4,762. Economic value of production would be US$13,284 per year. At the planned sales price to members actual cash receipts would be $4,968.

Capital investments will be made for constructing a boat and guard house at US$4,500. Nylon gill nets will be financed at US$1,200, a motor boat at US$1,230, and miscellaneous equipment at US$500.

(e) Acopalca Combined Fish Farm and Lake Sub-Project:

This sub-project has a B/C of 1.27 and an IRR of 27.56%. Acopalca integrates under one private administration three activities: (a) a hatchery unit, (b) a fish farm unit, and (c) a lake (Purhuay) unit.

This sub-project is expected to develop its full annual output of 46.8 MT of trout by the third year at a total annual cost of US$29,039. Expected gross revenues total US$57,564 per year.

3. Secondary Benefits and Replicability

(a) Secondary Benefits Accruing to non-project groups

It is expected that secondary benefits will be achieved through replication of experimental fish farms in other areas of Ancash. Both the Pellet Plant and Huaraz fingerling hatchery will provide inputs into new fish farm ventures, through the sale of surplus production, and new techniques and other results of applied research will result in more efficient initial operations than have occured in the past. Presently, fish farms in the area are working at an estimated 5-4:1 feed/flesh ratio and fingerling mortality is high.

The GOP is presently engaged in an active program to promote commercial trout farming in the sierra as a means of increasing income, improving nutritional status among campesinos, and creating off-farm employment. Table III-E-3 shows the operating, underconstruction and projected fish farms in the Ancash area.

It is not possible to quantify with any real precision the secondary benefits which are expected to accrue as a result of initial project inputs, since projected construction will be phased over a number of years, and the bulk of new fish farms will probably come into production after the anticipated four-year life of the project. If, however, the GOP carries through on plans to complete five under-construction fish farms as well as construct nine additional farms, and all current assumptions are correct, 1/ we can approximate financial and economic benefits.

1/ Current assumptions are: (a) an annucal production cost of US$848 per MT of trout (Huashao sub-project estimates); (b) trout market prices remain the same; and (c) a 2/1 feed/flesh ratio can be achieved.

(i) Financial

RFO estimates that the projected total of 19 operating and projected fish farms will produce at least 389 MT of trout per year with an average total consumption of 1556 MT of feed, applying a conversion ratio of 4/1. However, based on the proposed project and reduction of the conversion ratio to 2/1 1556 MT of feed will produce 778 MT of trout. The 389 MT surplus constitutes an increment of 100% over the without project output. The incremental gross sales value 1/ of this 389 MT surplus would amount to US$478,470 and costs 2/ to US$329,872. Net incremental benefits total US$148,598. Distributed over 19 fish farms affecting at least 2,605 families or 13,025 people 3/, this would add approximately US$11.41 of new revenue per capita per year among participating communities.

(ii) Economic

Secondary benefits derived from Project surplus feed and fingerlings.

Table III-B-2 projects the economic benefits of potential project replication via the sale of surplus project fingerlings and feeds over a four year period to six non-project fish farms in Ancash. Five of these are currently operating and have a trout production capacity of 15 MT each, and a sixth with a capacity of 30 MT of trout per year will be completed during 1977-78. Benefit and cost streams have been discounted at 15% over a 25 year period, resulting in an estimated B/C ratio of 1.36.

Economic benefits of expanded fish farm production.

The GOP currently has plans to construct an additional nine fish farms in the Ancash region, with an annual trout production capacity of 20 MT each. This would require the expansion of pellet and fingerling production (estimated to cost approximately $45,000 and $29,000 respectively); the construction of nine new fish farms estimated to cost $45,000 each; and annual labor maintenance and production costs of approximately $278,000 per year once the new fish farms are in production. Comparing these costs to estimated benefits, and discounting these at a rate of 15% over a 25 year period, an overall B/C ratio of 1.03 is projected. (See Table III-B-3.)

1/ Assumes trout selling price of US$1,230 x MT.
2/ Assumes annual unit cost of US$848 x MT derived from Huashao sub-project case.
3/ Average family size of 5 members.

TABLE III-B-1

B/C RATIOS AND IRR's OF PROJECT AND SUB-PROJECTS 1/

Project and Sub-Projects	Operation Sector	B/C	IRR (%)
1. Overall project	-	1.10	-
2. Pellet Plant	Public	1.00	-
3. Huaraz Hatchery	Public	1.00	-
4. Huashao Fish Farm	Private	1.04	19.10
5. Querococha Lake	Private	1.51	50.00
6. Acopalca combined Fish Farm and Lake	Private	1.27	27.56

1/ Results derived from data and computations are included in Tables E-1 through E-12 of Annex E.

TABLE III-B-2 - ECONOMIC MEASURE OF SECONDARY MARGINAL BENEFITS DERIVED FROM PROJECT SURPLUS FEED AND FINGERLING AFFECTING OTHER NON-PROJECT FISH FARMS IN THE REGION OF HUARAZ 1/
(In MT and Dollars per year)

Year	Surplus feed 2/	Output (MT)		Incremental ($)				PW Cash Flow 15%	PW of Cost 15%	PW of Gross Revenue 15%
		Without Project	With Project	Output	Cost 3/	Gross 4/ Revenue	Cash Flow			
	(MT)			(MT)						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	14	3.5	7	3.5	21,468 5/	4,305	(17,163)	(14,932)	18,677	3,745
2	119	30	59	29	24,592	35,670	11,078	8,375	18,591	26,966
3	172	43	86	43	36,464	52,890	16,426	10,808	23,993	34,802
4	208	52	104	52	44,096	63,960	19,864	83,032	184,321	267,353
↓	↓	↓	↓	↓	↓	↓	↓	-	-	-
25										
								87,283	245,582	332,866

(B/C) = 1.36

Incremental NPW: = $87,283

1/ Surplus feed applicable to 5 operating and 1 under-construction fish farms.
2/ Assumes feed supply as limiting factor of incremental output.
3/ Incremental cost valued at US$848 x MT. Unit cost estimated on the basis of Huashao's annual production cost (US$30,530 per 36 MT per year).
4/ Assumes output selling price of US$1,230 x MT).
5/ Includes operating cost of US$2,968 plus estimated investment cost of US$18,500 for completing construction of one 30 MT capacity fish farm.

TABLE III-B-3

BENEFIT COST COMPUTATIONS FOR REPLICATED PROJECT

Year	Investment Cost 1/	M&O Cost	Prod. Cost	Total Cost	PW 15%	Gross Benefit	PW 15%
1	478,794	-	-	478,794	416,551	-	-
2	-	45,602	232,370	277,972	1,554,975	361,570	2,022,622
↓		↓	↓	↓	-	↓	-
25							
					1,971,526		2,022,622

B/C = 1,0259

1/ Includes

a. Pellet Plant: $ 45,000
b. 9 fish farms: $405,000 (at $45000 each)
c. Expanded hatchery: $ 28,794

C. Financial Analysis and Plan

1. Financial Viability of Project Activities

a. Methodology Used - Preliminary cash flow projections were made for each of the five sub-projects to test the financial viability of the contemplated activities. These projections estimated total outflows and total inflows on a year-by-year basis through the first ten years of operations. Outflows include investment costs in the first year (capital items and construction), replacement of minor capital items in years five, six, and ten, recurrent operating expenses (salaries and wages, and annual production inputs), and a provision for contingencies calculated at 5% of the year's cash outflows.

Land rental 1/, utilities, and maintenance costs are itemized in the projections for the pelleting plant, but are not explicitly included for the other sub-projects. Land will not be a cost for the hatchery as land is already available under its current operations for the other sub-projects the land to be used will belong to the respective community, and therefore will not constitute a cash cost. Utilities and maintenance costs will be marginal in the operations of the hatchery, fish farms, and lake harvesting and can be considered in the 5% contingencies provision. Taxes are not considered in the projections of any of the sub-projects, since operations owned by the government or by small rural communities are typically tax-exempt.

Cash inflows include revenues from sales, A.I.D. grant funds, GOP cash contribution, and cash surplus from the preceding year's operations. In general, A.I.D. grant funds are allocated to cover the capital costs in the first year, plus a share of the start-up costs of operations until revenues from sales are adequate to cover operating costs. For the government-owned trout feed plant and hatchery the GOP will contribute to meet the initial cash deficits. When the sub-project begins to show a net cash balance, that amount is carried over into the next year's inflows.

1/ Although it is anticipated that EPSEP will make the planned pelleting plant site available to the Ministry of Fisheries at no cost, a land rental factor has been included in the economic and financial analyses at prevailing prices. If a rental fee is charged it will be borne by the Ministry of Fisheries as part of its cash project contribution. The inclusion of this factor in the analyses, as with certain other factors such as the assumption of zero sales of market trout by the Huaraz hatchery, tend to render the Mission's estimates conservative.

b. Price Assumptions - The key assumptions in these projections are those related to prices of production inputs and sales of production, notably prices at which trout feed, fingerlings, and fresh trout are sold. It is assumed that production of feed from the trout pelleting plant will be sold at $277 per metric ton, which represents a small economic subsidy 1/. Purchase of feed as a production input for the community sub-projects is costed at the same subsidized price. The price of fingerlings production from the Huaraz hatchery will also be subsidized; it is assumed that the hatchery will sell, and the communinites will buy fingerlings at $11.00 per kilogram, or $0.025 per fingerling 2/.

Assumptions as to sales price of trout production differentiate between production for non-local consumption and for local consumption. It is assumed that trout production from the fish farms at Acopalca and Huashao will be sold entirely to EPSEP at $1.23 per kilogram. For the purpose of the financial analysis it is assumed that all production from Lakes Querococha and Purhuay will be sold to the community members at an assumed price of $0.46 per kilogram, although in practice a portion, estimated at 20%, will probably be sold locally at higher prices or processed for sale in regional markets.

c. Results - The preliminary projections of cash flow through the first ten years of operations show each of the sub-projects to be financially viable given initial A.I.D. and GOP contributions and the assumptions made regarding prices. The trout feed plant will require a GOP cash contribution totalling about $22,000 in the first two years in addition to the A.I.D. funds allocated for investment and some operating expenses in the first year. Beginning in year 3, however, revenues from sale of feed production will cover its recurrent, but not replacement, costs. An additional $8,000 in GOP financing will be required in year 6 to defray the costs of replacing a delivery vehicle. Any profits from the operation will be passed on to the community fish farms as subsidized feed prices.

The Huaraz hatchery will also require both A.I.D. and GOP funding in the first two years to cover investment and start-up costs. The GOP funding will be a continuation of its current budgetary provision for salaries and wages and production inputs for the hatchery. As the hatchery begins to sell its production and as the production increases, the dependence on GOP budgetary support will be reduced from its current level, and will be eliminated by year 3 when the hatchery becomes self-financing. Replacement of minor capital items in year 6, however, will require

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1/ The economic equilibrium sales price (taking into account amortization at opportunity cost of capital is $306/MT.

2/ The economic equilibrium sales price of fingerlings from Huaraz is $12.60/kg., or roughly $0.03/fingerlings.

partial financing from the GOP, or a cash contribution of a little over $2,000. Again, profits are being passed on to the communities in the form of subsidized prices of fingerling production.

The Huashao fish farm will require, in addition to the initial capital investments, financial assistance for working capital in the first two years of the sub-project, as the fish farm phases into full production. The cash deficit continues through project year 2 when the farm is incurring high recurrent production costs yet producing at only 50% capacity. After this point, however, production costs drop due to gradual achievement of a more efficient feed conversion ratio, while production rises. Full production capacity is reached in year 4, and for that year and thereafter annual sales revenues exceed annual production costs by roughly $11,000, providing a sizeable continual net cash balance each year.

The stocking and harvesting of trout in Lake Querococha requires little capital investment and a marginal cash contribution amounting to $3,600 for start-up costs. Revenues begin with 50% production in year 2, but do not cover costs for that year. With full production in year 3, however, the sales revenues begin to cover recurrent costs each year with some $200 as a net cash balance.

Like Huashao, the Acopalca sub-project requires both investment capital and a cash contribution to meet its operating deficit as it phases into full production in both its lake harvesting and fish farm operations. A cash deficit totalling $13,300 in years 1 and 2 will be partially covered by the community which will continue to pay wages and salaries and purchase production inputs at the funding levels which it is currently providing for the operation (estimated to be roughly $3,500 annually). The balance required to cover the deficit (an estimated $6,300) will be provided under the project.

The financial analyses tables are contained in Annex F.

2. Project Budget Analysis

The total estimated project cost is 863,974. This total includes all direct costs of new investment in facilities, working capital required to finance start-up costs, technical assistance and training, and GOP counterpart technical and administrative personnel. Project financing will be provided from A.I.D. grant funds, GOP budgetary resources, and in-kind contributions from the GOP and the participating communities.

A.I.D.'s grant-financed contribution to the project will be an estimated $465,000. (The breakdown of these costs in shown in Table III-c-1.) Roughly half, or $240,600 will be used to finance implementation of the five sub-projects. Most of these funds will be used to procure equipment, machinery, materials, vehicles, and technical services required in the installation of the sub-projects. An estimated $95,496 of these will be dollar costs of U.S. goods and services.

A.I.D. will also provide working capital to finance some portion of the start-up operating expenses. In those sub-projects which are not currently operating, A.I.D. will finance the procurement of production inputs. For the Huaraz hatchery and the Acopalca fish farm/lake complex, both of which are currently operating, A.I.D. will only contribute to defraying the costs of improved inputs which are additional to existing operations, i.e., feed for both the Huaraz hatchery and Acopalca, and medicines and chemicals for Acopalca. In addition to financing these first-year costs of improved operations, A.I.D. will provide supplementary working capital to permit the private sector operations to cover their cash deficits in the initial years (see Section F.1, above). Total A.I.D. financing of operating expenses will be approximately $61,300, all in local currency.

The remaining half of the A.I.D. grant will finance a program of technical assistance and training in support of the project and its subsequent replication. Costs of this program to be financed with A.I.D. funds will include technical services, equipment, vehicles, participant training, and incidental travel costs associated with the promotion campaign. These total an estimated $224,450, of which approximately $205,450 will be for U.S. goods and services.

The counterpart contribution will comprise primarily the costs of technical and administrative personnel, both in the Ministry offices in Lima and assigned to Region II in Chimbote and Huaraz. In addition, the first year cost of the administrator of the feed pelleting plant will be financed with counterpart funds. After year one this position will be funded from sales proceeds.

Seven technicians will be assigned to the project (4 of these full-time); salary costs of these personnel will total approximately $54,330 over the life of the project. Installed administrative capacity, including personnel, vehicles, office facilities, etc., is valued at roughly $178,612. In addition, the GOP will pay construction costs for the Huaraz hatchery, an estimated $2,300, and, as explained above under #1, will provide a cash contribution to meet initial operating expenses of the feed plant which will be approximately $22,000. To the value of these counterpart components should be added the value of existing infrastructure at the Huaraz hatchery estimated at $92,308, plus the current annual budgetary provision for hatchery operating expenses, roughly $9,231. The total value of the GOP counterpart contribution to the project, then, is an estimated $386,474.

The participating communities will provide labor for the construction of facilities in the three non-government sub-projects. The costs of this construction are estimated to total $5,500. Acopalca will additionally contribute an estimated $7,000 in personnel and production inputs in project year 1 in excess of sales revenues.

Notes re: Technical Assistance Plan and Costing

The technical assistance plan was jointly designed by the zonal fisheries office, USAID fisheries consultant, Dr. Harold Hagen, and USAID staff. It is considered adequate for services required for successful project implementation provided the specialists recruited are highly qualified, have adequate Spanish capacity and can identify with development situations, assumptions which are considered reasonable. Thus a series of one and two week repeated TDYs are scheduled. Given the level of expertise desired, costing is based on actual cost of consultants recently provided to the Mission under the AID/W contract with Experience, Inc. These costs are $333 per day including overhead and fees, $730 for transportation, $46 per day per diem, and miscellaneous costs, for a total of about $2,500 per six day work week.

Priority in recruitment will be given to those specialists who have expertise in more than one area, thus potentially effecting some minor savings in transportation costs. Efforts will be made to recruit qualified Peruvians to meet specialty requirements 6 and 7 on Table II-1, i.e., marketing and cost analysis and administration and accounting.

Participant costing is in accordance with standard AID cost factoring for long and short-term participants.

The costing of imported commodities is contained in Annex B.

TABLE III-C-1

BUDGET SUMMARY (AID GRANT)

Sub-Project Investments		
Equipment, machinery, materials	$154,000	
Installation costs	1,500	
Vehicle procurement	23,500	
Operating expenses (including contingencies at 5%)	61,600	
Sub-Total		$240,600
Technical Assistance and Training		
U.S. technical services: 33 weeks	$ 82,500	
Training of GOP technicians: 56 m/m	70,000	
Farmer training: 18 weeks	11,000	
Training and research equipment	21,950	
Promotion program: truck and operating costs.	39,000	
Sub-Total		224,450
Total		$465,050

D. Social Analysis

1. The General Setting

The Peruvian sierra is typified by harsh terrain, severe climate, a limited agriculturally productive land base, and undependable rainfall. Notwithstanding the physical and natural hardships of the area, over 40% of Peru's farm families live in the sierra. For much of this impoverished zone per capita incomes are substantially less than $150 per year. Typical farm size tends to be less than one hectare per family. Chief among the non-economic characteristics of this population are that the people are primarily of indian descent, that they tend to speak indigenous languages, and that they have limited access to schools and health services.

It is the people of the sierra who constitute AID's primary target group. Although for a portion of this target group improvements in their quality of life will be realizable through traditional on-farm employment by introducing new seeds and low cost technology, by upgrading and extending small irrigation systems and on farm storage, etc., for a substantial number of the population improved quality of life will be attainable only through off farm employment, relocation to better farming opportunities in the high jungle, or by the introduction of new "on-farm" economic activities. Because the sierra abounds with lakes and streams the cultivation of trout is considered as one such non-traditional enterprise that has considerable potential for raising incomes and improving nutrition among the sierra population.

2. The Department of Ancash

The fresh water fisheries research and demonstration project described in this PP will take place in that part of the sierra which lies within the northern Department of Ancash. The Department is typical of the sierra. With a total population of about 750,000 persons, 41.7% of the farms are of less than one hectare and 89.2% are of less than 5 hectares. The population is predominantly indian and Quechua is the predominant language in the rural areas. Illiteracy and infant mortality rates are high and incomes are low. As elsewhere in the sierra, the actual consumption of animal protein is only one-third the level considered as the daily minimum requirement by the health authorities and for vegetable protein the deficit is about 15%.

In the Geographical Analysis of the Peruvian Poor undertaken by the USAID during FY 76, the Department of Ancash received a composite marginality score (CMS) of 43. (The least

marginal Department received a CMS of 21; the most marginal a CMS of 55.) Ancash placed number 16 of the 23 departments. When viewed at the level of the provinces, the statistics are even more stark. Of Ancash's 16 provinces, eight fall within the lowest quintile and four in the fourth quintile. Thus the marginality rating of the department as a whole is substantially distorted by the relatively better-off coastal provinces of Santa and Casma. The population of the sierra provinces of Ancash clearly fall within the poorest majority.

3. Direct Project Beneficiaries

a. Group Identification and Characteristics

Implementation of the fresh water fish production activities in the Department of Ancash will involve three associative farm groups in three provinces.* The first is Acopalca in the province of Huari. This community will be responsible for the operation of one of the two project fish farms as well as one of the two lake sites. The second is Huashao in the province of Yungay. This community will be responsible for the second fish farm. The third is Catac in the province of Recuay. This group will be responsible for the operations associated with the second lake site. In each of the communities the campesinos have organized themselves for economic and social purposes into a "comunidad campesina" or Farm Community.

The three groups share generally similar characteristics, which are also generally typical of the sierra region. Each of the three provinces in which the groups are located fall within the lowest quantile of marginality as calculated in the USAID's recent study of the Peruvian poor. In size, the groups range from 758 persons in the Acopalca community to 1,535 persons in Catac. Huashao has a population of 1,200.

Economically, all three groups are engaged in small scale farming. Corn, potatoes and wheat are the principal crops of the Acopalca and Huashao groups. A limited number of sheep are also raised by the Huashao group, while that of Acopalca also raises goats, cows and hogs. In the case of Catac the order is reversed. Wool and mutton are the primary products of Catac, with secondary production devoted to corn, potatoes and wheat. Some artesania is also produced by these groups. For example Acopalca produces pottery which it barters for products not available in the community.

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* The data and analyses contained in this section are based in part on a report undertaken for the Mission by sociologist Luis Soberón, entitled "Social Diagnosis of the Populations of the Callejón de Huaylas and Callejón de Conchucos."

The population of each group is of indian descent. Quechua is spoken as the native language. Bilingualism is essentially limited to the population under 30 and to the male population, with the exception of Catac where 73% of the population claim to be bilingual. Illiteracy rates are high, again especially among women and persons over 40. In Acopalca, 46.7% of the men over 40 are illiterate and 91.7% of the women. In the 20-39 age group 60.2% of the women are illiterate. In Catac, only 16.3% of the population reportedly have completed primary school education, although an additional 47% have attended some school. This 47% is evenly divided between male (47.2%) and female (46.7%). All three communities have experienced significant outward migration by the younger generation, especially young males, in search of better employment opportunities. Of the three communities, Catac appears to be somewhat more progressive with higher rates of bilingualism and literacy and higher incomes.

b. Interest and Roles of Communities in Fish Farming

The interest of the three communities in fresh water fish production is assured in that the communities are in effect volunteers. Since the establishment of the Zonal Office of the Ministry of Fish in the early 1970's the personnel of the zonal office have carried out a series of promotional campaigns to interest the rural population in fish rearing. Attesting to the success of these promotional campaigns is the fact that some 160 groups in the area have made application for fisheries development. The Zonal Office has, in effect, oversold fish farming, as neither the capital resources nor the technical capacity have been available to attend to these requests. It is also possible that the employment and phasing of economic benefits likely through fish farming have also been oversold - a subject which may require more explicit and realistic presentation at the replication stage following the present project. The three participating groups under the proposed project were identified through this promotional process. As indicated elsewhere, the Acopalca group already is fish farming on a small scale and construction is underway for the facility at Huashao. The Catac group will be involved only in lake production.

The fish farms, both the rearing stations and the lakes, will be self-operated by the participating communities. Virtually all decisions, including investment decisions and distribution of earnings, are made by the general assembly of all community members. In each area these groups are already in-being and operating. The day to day operation of the rearing stations and the periodic harvesting of the lakes will be under the supervision of a salaried technician, with advice and monitoring provided by the zonal fisheries office.

c. Community benefits

The participating communities under this project will essentially derive benefits in two forms: increased income and improved nutrition. The latter benefit will also be realized by other groups in the marketing area through the increased availability of animal protein at reasonable prices.

Benefits through new jobs created will be a rather minor element of the total benefits under the project. Skilled and unskilled manpower requirements for each of the rearing stations at their presently planned size and production will not exceed twelve persons at each location. Harvesting of the lakes will be an intermitent, part-time occupation. Some additional part-time employment is expected to be generated relative to the cleaning, processing and marketing of trout, especially those harvested from the lakes. These latter jobs will likely be assumed by female members of the participating groups.

Rather, the principal income benefits to the groups as a whole will be from the net earnings derived from the sale of the trout, both from the rearing stations and the lakes. The distribution, investment or other utilization of these net earnings will be determined by the general assembly of the respective participating group. As each group has plans or ambitions for other community enterprises in addition to trout production, it is anticipated that a primary use of net earnings will be as investments in other employment/income generating projects which will further benefit the group as a whole.

In order to assure that only net earnings are distributed, educational programs will be conducted for the general assembly of the groups as to the operational requirements of the facility, including working capital requirements for salaries and feed through each harvest. In the same manner assistance will be offered to help the group in evaluating earnings distribution/investment alternatives. Agreements between the Ministry of Fisheries and each participating community will contain a provision that receipts from sales should be utilized first to cover operational, including working capital, requirements of the enterprise and secondly for other community economic investment activities.

The nutritional benefits, which will accrue to the participating groups and the community at large, are through the consumption of trout harvested from the lakes. As indicated above, the consumption of animal protein in the sierra is substantially

below recommended levels. As also indicated elsewhere it is the expectation of this project that trout can be harvested from the lakes and sold to community members at a cost of about 46 cents a kilogram. This price would be competitive with alternative sources of animal protein as well as with many vegetable products.

As nutrition improvement is an important element of this project, considerable but inconclusive efforts have been made to attempt to determine the acceptability of and demand for trout in the diets of the target population. The result of analyses undertaken to date suggest only that the population is neutral towards trout (and other fish species). Validity of the hypothesis that the local population will consume trout if available is suggested by the fact that no cultural or religious barriers to fish consumption exist. The small amount of fish currently consumed is said to be due to the fact the lakes and streams have been fished out, further suggesting that a demand for fish existed previously. It is also of interest that in an EPSEP survey of fish consumption practices, the non-availability of trout rather than its cost was given as the primary reason for low consumption. On the other hand, in the case of Acopalca, there appears to have been no demands placed by the community group to set aside a specific number of fish each year to be alloted for self-consumption by the community members as is frequently done by such groups which raise other forms of animal protein. The Mission believes, on balance, that the hypothesis on local consumption is valid but this will require careful evaluation during the life of the project.

d. Role of Women

Women play a significant role in the rural sierra economy. In agriculture they are often active participants in production, harvesting and marketing. A somewhat similar pattern exists in rural piscieulture where women usually are responsible for cutting, washing, cleaning, weighing and packing of fish; they also play a significant role in commercialization. The Mission is presently funding a study being conducted by the Centro de Estudios de Población y Desarrollo on the role and status of campesina women in four areas of the country. The study will provide an expanded data base and general background on the role and status of rural women in coastal, Andean and jungle areas of Peru. The study should be completed by July 1977.

Several references to women have previously been included in the Project Paper, e.g., level of educational achievement of females in the three farmer communities, women as the target of promotional campaigns designed to encourage increased consumption of trout, and the likely employment of women in the preparation and marketing of trout. Although it is anticipated that this project will not have a significant impact on the role and status of women, the limited impact should be positive. In this section

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we shall discuss the role of women in the implementation of the project and elaborate somewhat on the key role women are expected to play in affecting increased consumption of trout at the local level.

The degree of consciousness of women's rights in Peru is relatively high when compared to other L.A. countries and equal opportunity for professional employment is generally accepted. Women are progressively pursuing careers which were traditionally reserved for men and are currently encountered at all levels in the ministries from field promotors to senior bureaucrats.

Although female professionals are found throughout the Ministry of Fisheries, there are none at the present time assigned to Zone II regional fisheries office. Because of the increased responsibilities of the zonal office this situation is expected to change under this project. In anticipation of the project the head of the zonal office has been informally considering candidates for a limited number of new positions to be established at the zonal level. It now appears most likely that the position of fisheries specialist will be filled by a female with an engineering degree in this subject. There is also a female being considered among the candidates for a civil engineering position in the zone. Thus it is likely that the project will open up one or more non-traditional employment oportunities for women.

Also at the level of the Ministry, the nutrition/fish consumption promotional team that will be sent to the zone consists entirely of females: two promoters and a cook.

At the level of the community, the importance of reaching the female population that determines what to buy and what to cook is obviously critical to improving the local diet by increasing animal protein consumption. This task will fall principally to the promotional team referred to above. For this purpose a series of two day courses will be held which will include basic nutrition, fish preparation, and cooking suggestions.

The zonal office has also indicated that the training courses for managers and workers of the cooperating farmer communities will be open to females as well as males and intends to encourage such participation. Actual selection of those to be employed on the fish farms will be made by the farmer communities themselves, however. The female members of the communities participate in the General assemblies.

In order to measure the impact of this project on women several indicators will be measured through the life of the project. These are: 1) the numbers of training opportunities made available to both men and women and the content and duration of such programs; 2) the number of full time and part time jobs which are created in the production, processing and

marketing of trout and the number of these held by women and the income they derive; and 3) changes in the dietary habits of the target population, paying particular attention to increased consumption of trout.

4. Social Analysis Conclusions

Based on the discussion contained in this and previous sections of the PP it is the judgement of the Mission:

a. That the target groups are clearly part of the rural poor and appropriate recipients of AID assistance,

b. That the proposed project is compatible with the socio-cultural environment as indicated by the prior decision of the groups to participate in the project and the existing community mechanisms and organizations for operating similar enterprises,

c. That there will be significant benefits of income and probably in nutrition which will accrue to the recipient groups, and

d. That there is a promising potential for spread effects to other like groups through project replicability based on (continues on page 51)

the already expressed interest by numerous other groups to become engaged in trout production.

E. Market Analysis

1. Lake Production

The project design anticipates that up to 80% of the trout harvested from the project lakes will be self-consumed by the community members. Given the level of expected production and the present population of the communities the average monthly family consumption would be 2.5 - 3.0 Kg. The trout will be made available to the community members at the price of $0.46 per Kg. It is probable that some community members will elect to resell their trout to restaurants, tourists or in nearby towns in lieu of self-consumption. However, the small volume to be made available each month to each family (12-17 fish) and the relatively small margin of profit that could be expected to be realized by reselling the trout locally are anticipated to discourage resale and favor the prospects for self-consumption. As mentioned elsewhere, the Zonal Fisheries Office will also mount an intensive campaign to encourage self consumption.

Although self-consumption of trout is the primary goal of the lake sub-projects, the project design anticipates that not all lake production will in fact be procured by the community members. This surplus will be marketed by the community enterprise. Two forms of marketing are anticipated. Fresh trout will be sold in the provincial capitals (Huari and Recuay) and Huaraz. Processed trout, smoked and salted, will be sold in these and other regional markets. Existing data on regional market demands for trout indicate that at the present time either option is capable of absorbing the total marketable surpluses from the lakes.

2. Fish Farms

Trout presently being produced in Ancash, e.g. at the Huaraz hatchery and at Acopalca, are being procured by EPSEP, the GOP fish commercialization agency, at the guaranteed price of 80 soles per kilogram. Ministry of Fisheries authorities have indicated that this practice will be continued. Ample cold storage capacity exists in Huaraz for holding the trout until marketed locally or forwarded to markets outside Ancash.

EPSEP operates in nearly all parts of Peru and commercializes both fresh and salt water fish, and both wholesale and

retail. For these purposes EPSEP offices exist in most major cities, cold storage facilities are maintained at convenient locations, and a sizeable fleet of refrigerated trucks and trailers are maintained. EPSEP also actively promotes fish consumption.

Ready markets exist for fish of uniform size in economic quantities such as will be produced by the project fish farms. The harvesting requires relatively few people and simple materials, knives, plastic bags, scales and water, and can be performed at the point of harvest. Training in methods of gutting, sorting and packaging can be given in a very short period of time.

3. Consumption of Trout in Huaraz

A 1975 survey by EPSEP in Huaraz showed that 93.5% of respondents had a strong preference for trout. Though annual consumption was low (slightly more than 2 kilograms per year) 66% attributed this to shortage of trout, 22% to the high price and 12% to poor methods of distribution. The EPSEP study estimated consumption at 17,200 Kg of trout annually in Huaraz. This would be much higher if supply were to expand, thereby providing a ready market for much of the commercial trout production of the area.

4. Consumption of trout elsewhere

Outside the Province of Ancash, trout when available, finds ready markets in coastal cities, especially Lima. Supplies at present are so thin in comparison to potential demand that no analysis of the market relationship is possible.

EPSEP has, however, analyzed the export market and has conducted marketing trials (1970) to obtain data on acceptability of Peruvian trout and to gain experience in the handling and marketing process. Foreign market specifications and flows were studied in detail. EPSEP then harvested, prepared, froze and packaged trout for shipment and testing abroad. Rural people at the production site were instructed in handling and cleaning the fish before they entered the EPSEP system. The results were generally favorable. (Some initial problems were encountered in the proper handling of frozen trout and for one market the gill was removed counter to local preferences.) Limited quantities have subsequently been exported by EPSEP to Colombia and other countries.

5. Marketing of Pellet Plant Output

Table III-E-1 shows the projected output from the Pellet Plant, which stabilizes at an annual production of 360 MT in the third year of the Project. The combined demand of Project financed sub-projects is projected to be 152 MT in the fourth year, leaving a feed surplus of 208 MT (55% of total production).

It is anticipated that this feed surplus will have a ready market in non-project fishfarms in the Department of Ancash. Five of these are currently in operation and have a trout production capacity of 15 MT each. A sixth trout fishfarm, which will have a total capacity of 30 MT per year, is presently 60% constructed and will be completed during 1977-78. These six non-project fishfarms, with a total annual potential output of 105 MT, will be able to absorb all the surplus feed from the Pellet Plant.1/

6. Fingerlings

Table III-E-2 shows projected supply of fingerlings from the Huaraz hatchery, along with estimated demand of the Huashao and Lake Querococha sub-projects. The surplus of fingerlings which will be made available to non-project fishfarms in the area amounts to 3,742 kg. per year after the fourth year, when fingerling production stabilizes. Using a basic formula of 440 fingerlings per kilogram, approximately 100,000 fingerlings per 18 metric tons of trout produced and a 10% fingerling loss the fingerling surplus from the Huaraz hatchery would supply fishfarms with a capacity of an estimated annual production of 285 metric tons of trout.2/ The total capacity of fishfarms currently operating, under construction or projected which fall under the jurisdiction of the RFO (excluding those to be financed under the proposed project) is estimated at approximately 440 MT per year. (See Table III-E-3) These will be primary purchasers of the Huaraz hatchery surplus.

The timing of new fishfarm construction is obviously a critical factor in the financial feasibility of the hatchery, and the financial and economic analyses of the sub-project assume the immediate sale of all production - a situation which may not in fact, occur in the short run. In this event, the hatchery would operate with a GOP subsidy during the early years, as it does at the present time. In the medium to long run, however, as the new farms come into production, the hatchery will become financially self-sufficient.

1/ 14 additional fishfarms under the administrative jurisdiction of the RFO are also contemplated; five are in varying stages of construction and will be completed by 1978, and nine more are at the project stage with construction scheduled by 1982.

2/ $\frac{3,800 \times 440}{100,000}$ - 10% (losses) x 18

TABLE III-E-1

DEVELOPMENT OF DEMAND FOR AND SUPPLY OF FEEDS FROM PELLET PLANT DURING 10 SUB-PROJECT YEARS (In MT) 1/

Year	Pellet Plant Supplies	Huaraz Hatchery Demands	Huashao Fish-farm Demands	Acopalca Fish-farm Demands	Feed Surplus
1	90	4	36	36	14
2	270	7	54	72	137
3	360	8	48	108	196
4	↓	↓	72	72	208
↓	↓	↓	↓	↓	↓
10	360	8	72	72	208

1/ Available to other non-project fish farms during 10 sub-project years plus additional 15 project years assuming plant replacement is realized at the 11th year.

TABLE III-E-2 - DEVELOPMENT OF DEMAND FOR AND SUPPLY OF FINGERLINGS FROM HUARAZ HATCHERY DURING 25 SUB-PROJECT YEARS 1/ (In Kg.)

Year	Huaraz's Hatchery Supplies	Huashao Fish-Farm Demands	Lake Querococha Demands	Fingerlings Surplus 2/
1	1,818	220	273	1,325
2	3,636	330	136	3,170
3	4,090	440		3,518
4	4,318			3,742
↓	↓	↓	↓	↓
25				

1/ 440 fingerlings per kg.

2/ Available to other non-project fish-farms.

TABLE III-E-3

FISH FARMS FALLING UNDER THE JURISDICTION OF RFO 1/

Fish Farm	Estimated Output Capacity (MT x yr.)
Operating	
Paria	15
Matcor	15
Jinua	15
Palmira	15
Sirenacocha	15
Under Construction 2/	
Tumpa	20
Olleros	30
Mallgui	14
Gueushaj	30
Mallash	25
Projected	
9 fish farms	250

1/ Excluding project fish farms

2/ To be completed during 1977-78

IV. IMPLEMENTATION PLANNING

A. Implementing Agencies

1. Identification of Key Implementation Entities

a. Ministry of Fisheries (MinFish):

MinFish as the grantee will be responsible through its Inland Fisheries Division for the overall administrative and policy direction of the project, including assignment of personnel, coordination with EPSEP for marketing arrangements, providing counterpart financing for the various project activities and elements, and facilitating the importation of ova and donated commodities as well as their internal transportation.

b. Zone II of the Ministry of Fisheries:

Zone II will manage day to day operations of the project from its headquarters in Chimbote. It will be directly in control of the operation of the pelleting plant and distribution of feed. Zone II will also supervise the distribution of fingerlings and trout ova from the Huaraz hatchery. The office will bear responsibility for local coordination with EPSEP for transportation and marketing of trout from the beneficiary communities. The Zone will administer the bulk of the funds dedicated to this project for the engineering works associated with improvement of hatcheries, fish farms and lakes. It will also administer training and coordinate technical assistance through its sub-office and hatchery in Huaraz. As Ancash falls within the geographic area of the Regional Office for the Development of the Zone Affected by the (May 1970) earthquake (ORDEZA), the MinFish Regional Fisheries Office will also keep ORDEZA appraised of project progress. ORDEZA, however, has no assigned role in project implementation.

c. Indigenous Communities:

The three indigenous communities, those of Huashao, Catac and Acopalca, will be responsible for the administration and day-to-day management and operation of the two project fish farms and the two project lakes. Each sub-project will be administered by a Production Committee composed of a president, secretary, treasurer and 2 to 4 working delegates. Committee members are selected from among the members of the associative group by its General Assembly. The communities will be encouraged by the regional fisheries office to give priority consideration to those farmers which have shown particular interest and potential during the development of the projects and who have performed successfully during training courses on fisheries and related topics. The

production committee will in turn appoint those individuals, (technicians and laborers), who will be employed to operate each enterprise.

d. EPSEP:

The GOP marketing agency for fish products, EPSEP, is established throughout Peru and will purchase the production of trout of the two project rearing stations.

2. Evaluation of GOP entities

The liaison between the Fisheries Region II staff and the technical and administrative staff levels in the MinFish in Lima appears to be close and with no appearance of friction or problems that could impede the project. It is the judgement of consultants employed during project analysis and that of the USAID that there is every reason to expect effective coordination between the MinFish, the Zonal II Office and the Huaraz station.

The role of the Fresh Water Fisheries Division, as set forth elsewhere in the project paper, is critical and will require the full time attention during the life of the project of at least four of the seven counterpart personnel that have been committed to the project by the GOP. In the initial stages of the project all seven individuals will be required on an intensive basis to assure the coordinated development of the five sub-projects.

Great care was taken to evaluate the background and capabilities of each of the seven designated counterpart personnel. Although there is a need for additional training for some of the men, others have earned their Engineering Degree*. All have experience in the specialty to which they have been assigned. All are enthusiastic about the project and have taken it upon themselves to accumulate data and background material not only to improve their own capabilities but to investigate the capabilities of the communities that will undertake the projects. There is no question about their understanding the demanding nature of this project and its potential benefits.

Of considerable importance will be the local training program. It has already been demonstrated in Huari that outlying indian communities are anxious to become included in the project should it be expanded....

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* B.S. equivalent in specialized fields.

They, as well as the selected individuals in the project communities, will actively seek help, both financial and technical. Counterpart biologists will be responsible for establishing a level of training in the indian communities that will make them independent and self-reliant. They will, of course, need to maintain close contacts with all recipient communities to insure that governmental regulations are met and that proper management procedures are followed.

The fundamental capacity to carry out the project already exists and is reflected in the active inland fisheries programs administered by the Ministry and its zonal offices. This proposed project is designed to strengthen the Ministry and its subordinate offices in administrative and technical areas in which their current capability is weak. The weaknesses, centered primarily in the combination of planning and specialized skills, are recognized by the Ministry itself and the projects value is widely recognized. For this reason, the project was actively sought by the Ministry and is likely to be implemented with enthusiasm.

The mechanism to reach the target population, a basic extension/education model, is already in place, requiring only technical and procedural modifications which will be produced by the project. In turn, the receptivity of the target group is well assured (see Social Analysis). Although, as indicated previously, fish farming is believed to have been somewhat oversold in the project area (i.e., the Ministry's technical expertise and delivery capability may have failed to meet the expectations of the wider target group) it is believed that, by upgrading these capabilities and narrowing the near-term focus of the activity, delivery can be conformed to target group expectations and ability to benefit.

3. U.S.A.I.D.

Mission project monitorship for this activity will reside in its Rural Development Office. The Rural Development Officer has been designated as the Project Manager. He will be actively assisted by the Mission's local-hire Agricultural Economist, who has had a major responsibility for the project design and for development of the project paper.

Procurement of technical services and commodities, and arrangements for participant training, will be administered directly by AID utilizing standard AID procurement procedures. Direct procurement is indicated in this instance in view of the variety of commodity imports required and the fact they all occur in the first year and are of a non-recuring nature. While the counterpart entity has extensive experience with local procurement it has no capacity for off-share procurement. Moreover, the procedures for obtaining

approval for foreign exchange transactions, even when financed externally are cumbersome and time consuming. GOP contracting for foreign technical assistance is further constrained by present GOP austerity measures and would additionally involve waivers of GOP imposed salary limitations. In view of these factors, and the absence of any institution building benefit to be gained by training counterpart personnel in AID procedures, direct procurement will be undertaken in the interest of time and costs.

B. Phasing of Project

Essentially all procurement actions will be affected during the first six months of the project and all construction, renovations and improvements will be initiated and completed during the first year. The two lakes will be stocked during project year one using fingerlings now being produced at Huaraz and Acopalca. Imported ova will be introduced immediately upon receipt into the hatchery at Huaraz for development of brood fish.

Early in project year two at the latest all installations are expected to be in place. The feed pelleting plant in Chimbote will be operational and will be producing feed in the quantities and types required. The new raceways at Acopalca will be in place, construction will have been completed at Huashao and both will have been stocked. During the second half of project year two genetically improved fingerlings will begin to be available. Initial harvesting of lake trout will begin during this period.

By project year three, the demonstration project will be fully operational and some sub-activities will have begun to produce a net return. Harvesting of trout and restocking of fingerlings will have become routine. Important evaluation results will begin to be available concerning feed conversion rates, growth cycles, local consumption patterns, production capacities of project lakes, etc. Evaluation results will become more precise in project year four permitting firm decisions concerning replicability designs.

C. Evaluation Plan

Periodic evaluation is most essential since the project is designed to serve as a model for future replication, and its success or failure will determine, in great measure, future GOP commitments to and budgetary support for additional freshwater fisheries development projects in the highlands.

Three periodic annual evaluations are scheduled starting in January 1978 through January 1980. Special additional evaluations

will be carried out as needed. During the periodic annual evaluations project progress during the course of the preceding year will be measured against output levels and other progress benchmark indicators contained in the Logical Framework (Annex C). This will also include review of such items as adherance to schedules for completion of the fish pellet plant, mortality rates of fingerlings in hatcheries, fingerlings production in the Huaraz hatchery, sub-projects production data and marketing performances.

A special determinent of the success of the project (and subsequent bearing on the feasibility of replicating the project) will be the development and application of a "profitable" feed conversion ratio. Presently the average feed/conversion ratio being attained in Peru with respect to controlled trout production is 4-5/1 (i.e., four kilos of feed to produce one kilo of flesh). Since it is planned that the fish pellet plant at Chimbote will be placed in operation during the first 6-9 months of the project life, it should be possible to measure the effectiveness and success of the newly developed ration on the growth rate of trout after the second year. Although the impact of the new ration will be monitored closely throughout the project life, a special evaluation on this aspect will be undertaken and technical findings presented in a report due approximately one year from the initial utilization of the project developed ration. The objective here is to develop a feed ration which will ultimately produce a feed/meat conversion ratio of 2:1.

Another important aspect of the project which will be carefully evaluated is the local demand for trout. There is too little trout presently available to the populations of the project area to determine their demand for trout and impact on their nutritional status. During the periodic annual reviews, (especially during the second year review), an evaluation will be made of the demand for trout in the diets of the peoples inhabiting the project lakes areas, to determine cultural preferences as well as nutritional impact. As with other evaluations under the project, USAID and the MinFish's, Continental Division (DGPC) will jointly cooperate to measure the local demand factor.

Consideration will also be given to evaluating project impact on the incomes generated within the participating farmer communities. Special attention will be directed at determining the allocation or "spread" of generated income among the various members of the farmer communities to assure the maximum spread of benefits possible. This aspect of the project will lend itself to more meaningful measurements during the last year of the project life. Nevertheless, to the extent possible, prior periodic annual evaluations will also attempt to assess the income impact factor.

The latest Peruvian national census data (1972) does not contain per capital income figures below the Departamental geo-political level. However, information on incomes which are largely (if not completely) derived from "wages" received by the members of the three project farmer communities can be obtained from the cooperatives' records. Likewise, as indicated in the project's Logical Framework matrix, production data can be obtained from the records of the cooperatives. With the assistance of DGPC project counterparts information on past and current "wages" will be obtained from these records to be used as baseline data against which project impact on participating community incomes will be measured at yearly internals.

Although studies produced for the project contain considerable information on consumption habits, baseline data regarding actual nutritional status, specifically protein intake, of project farmer families is not readily available. This information, will be researched during the first six months of the project's life. The Mission will secure the services of a sociologist/anthropologist with experience in the nutrition/health field to undertake the necessary investigation of protein intake in the project area. This investigation will consist of random sample surveys of up to 20% of the farmer families of each of the three project areas. Additionally, in the Lake Querococha area several families not participating directly in the project (non-cooperative members) will also be surveyed so that some measure of project impact on these inhabitants will be possible at the end of the project life. A Peruvian professional will likely be employed to undertake the surveys, although anthropological expertise available in AID may also be tapped.

D. Conditions, Covenants and Negotiation Status

The proposed project was jointly elaborated by the USAID and GOP personnel of the Ministry of Fisheries. Policy contact has been maintained throughout with the Director Superior (Vice-Minister) of the Ministry. The determination of the target area was made by the Director Superior. Final design of the project, including mutual contributions and responsibilities were also reviewed with and concurred in by the Director Superior. There are no outstanding negotiation issues. In the judgement of the Mission the project is ready for formal approval and implementation.

Prior to initial disbursement of funds the grantee shall be required to submit to the USAID: a. Evidence that the site has been formally obtained on a long-term basis for the feed pelleting plant in Chimbote; b. Agreements between the Ministry of Fisheries and each of the three cooperating farmer communities specifying the responsibilities of each party and the sub-project implementation plan, ~~The~~ agreements shall also include a statement of principle concerning the priority uses of receipts from sales; c. Evidence that the Government has bestowed exclusive rights for stocking and harvesting of Lakes Purhuay and Querococha to the farmer communities of Acopalca and Catac respectively.

ANNEX "A"

Nutritional Status of the Rural Population in the Sierra:

During 1971 the Ministry of Health undertook a study 1/ to investigate the nutritional status of the Peruvian population. For this purpose all surveys performed during the 1950-70 period in the country were compiled, integrated and analyzed comparing results from the 1950-60 period with the 1960-70 period (See Table 1 and 2). A total of 2,194 families or 12,662 people distributed among the Departments of Tumbes, Lima, Callao and Tacna in the Coast; Ancash, Junin, Cuzco, Arequipa and Puno in the Sierra; and Amazonas and Loreto in the Jungle were surveyed during 1950-70, during the two periods, as shown in Tables 1 and 2. No significant differences are noted between results of both periods; particularly with regard to the rural people of the sierra.

Major conclusions of this comparative analysis are related to caloric intake; consumption of fats, proteins and carbohydrates; and consumption of vitamins and minerals. Table 1 shows for the 1950-60 period that rural people of the sierra derived on the average 82% of their calories from carbohydrates, 10% from proteins and 8% from fats and oils. The 82% figure for carbohydrates is the highest in the country (See column 2 of Table 1). This comparison indicates the diet of people in the rural sierra is based largely upon starchy foods such as potatoes, corn, wheat, oats, and barley.

Furthermore, interpretation of data in Table 3 permits us to conclude also that total proteins consumed are derived principally from the same kind of crops mentioned above. It can be deducted from these figures that rural people in the sierra consume on a daily per capita average basis 36 grams of vegetable protein derived principally from potatoes, corn and wheat; and 8 grams of animal protein. The intake recommended by the health authorities is 42.1 and 23 grams of vegetable and animal protein respectively. Consequently rural people in the sierra have a highly significant protein deficit (-21.1 grams), particularly animal protein (-15 grams).

1/ "Diagnóstico del Estado de Nutrición" (Diagnosis of the Nutritional Situation... of Peruvians); Health Sector of the National Nutrition Institute - 1971.

The nutritional situation since 1960 to the present does not show any meaningful change as can be verified through analysis of the production data in Table 4. It can be observed that total production of the 4 basic crops (potatoes, corn, wheat and barley) has increased at an annual rate of approximately 1.1% during 1960 through 1974. This growth rate is much lower than that of the rural population in the Sierra which is greater than 2.5%. This data also indicate that the nutritional deficiency, particularly in terms of animal protein will become more pronounced if appropriate solutions are not found. Presently this problem is somewhat alleviated indirectly through rural-urban migrational flows occurring generally on a seasonal basis; however, it has been observed that many rural migrants return eventually to their homeland.

TABLE 1 - Distribution of the total caloric-intake as derived from the consumption of carbohydrates, proteins, fats and oils in selected regions of Peru (1960).

Regions	No.of families Surveyed	Carbohydrates	Proteins	Fats & Oils
	(1)	(2)	(3)	(4)
Coast				
Urban	171	66	11	23
Rural	273	70	11	19
Sierra				
Urban	38	66	12	22
Rural	217	82	10	13
Jungle				
Urban and Sub-urban	183	75	12	13

Source: "The Nutritional Situation of Peru", Year Book of the Faculty of Medicine of the University of San Marcos, XLIII, No. 1 (1960).

TABLE 2 - Distribution of the total caloric intake as derived from the consumption of carbohydrates, proteins, fats and oils in selected regions of Peru (1971).

Regions	Nº of families Surveyed (1)	Carbohydrates (2)	Proteins (3)	Fats & Oils (4)
Coast				
Urban	79	66	11	23
Slum areas 1/	149	69	10	21
Sierra				
Central 2/	440	76	9	15
South 3/	220	81	10	9

Source: "Dietary Survey for the 1960-70 Period", Nutrition Institute of the Ministry of Health, 1971.

1/ Slum areas located in the surrounding of Lima, Trujillo, Piura, Arequipa and other major cities of Peru composed of principally rural sierra migrants.

2/ Associative farm groups from Central Sierra, basically from the Mantaro valley in the Department of Junin.

3/ Associative farm groups from Southern Sierra, viz., Cuzco and Puno.

TABLE 3 - Consumption of animal versus vegetable protein in urban and rural areas of Peru (in grams per capita per day)

Consumption	PROTEINS			
	Animal		Vegetable	
	Urban	Rural	Urban	Rural
	(1)	(2)	(3)	(4)
Recommended	23.0	23.0	42.1	42.1
Actual	23.0	8.0	31.0	36.0
Difference	-	-15.0	-11.1	-6.1

Source: National Food Consumption Survey undertaken jointly by the Ministry of Agriculture and Ministry of Economy during 1975.

TABLE 4 - Area and production of four major crops in the Sierra of Huaraz during 1960 and 1974 (in hectares and thousands of metric tons). 1/

	1960		1974	
	Area	Production	Area	Production
Potatoes	21000	126.0	20850	144.7
Corn	10100	10.1	13800	14.2
Wheat	22860	22.9	28350	26.1
Barley	20000	18.0	24760	21.3
TOTAL	73960	177.0	87760	206.3

Source: Statistics Office of the MinFood.

1/ Potatoes, corn, wheat and barley constitute the basic food basket of the rural people of the Sierra. Reportedly these four crops take more than 50% of the non-irrigated cultivated area in the Sierra of Huaraz, and more than 40% in the Sierra in general.

MAPA POLITICO DEL PERU

NOTA :

LA ZONA SOMBREADA CORRESPONDE AL AMBITO DE LA OFICINA REGIONAL II CHIMBOTE

Comparison of trout protein value with animal protein values of other products currently consumed in the Sierra.

Product	Protein Content (gr/Kg)	Price ($/Kg)	One dollar Purchases (gr) of Protein
Cuy 1/	190	2.31	82.3
Beef	210	3.08	68.2
Mutton	160	2.31	69.3
Pork	140	2.31	60.6
Poultry	200	2.46	81.3
Trout	210	1.23	171.0

1/ Guinea Pig.

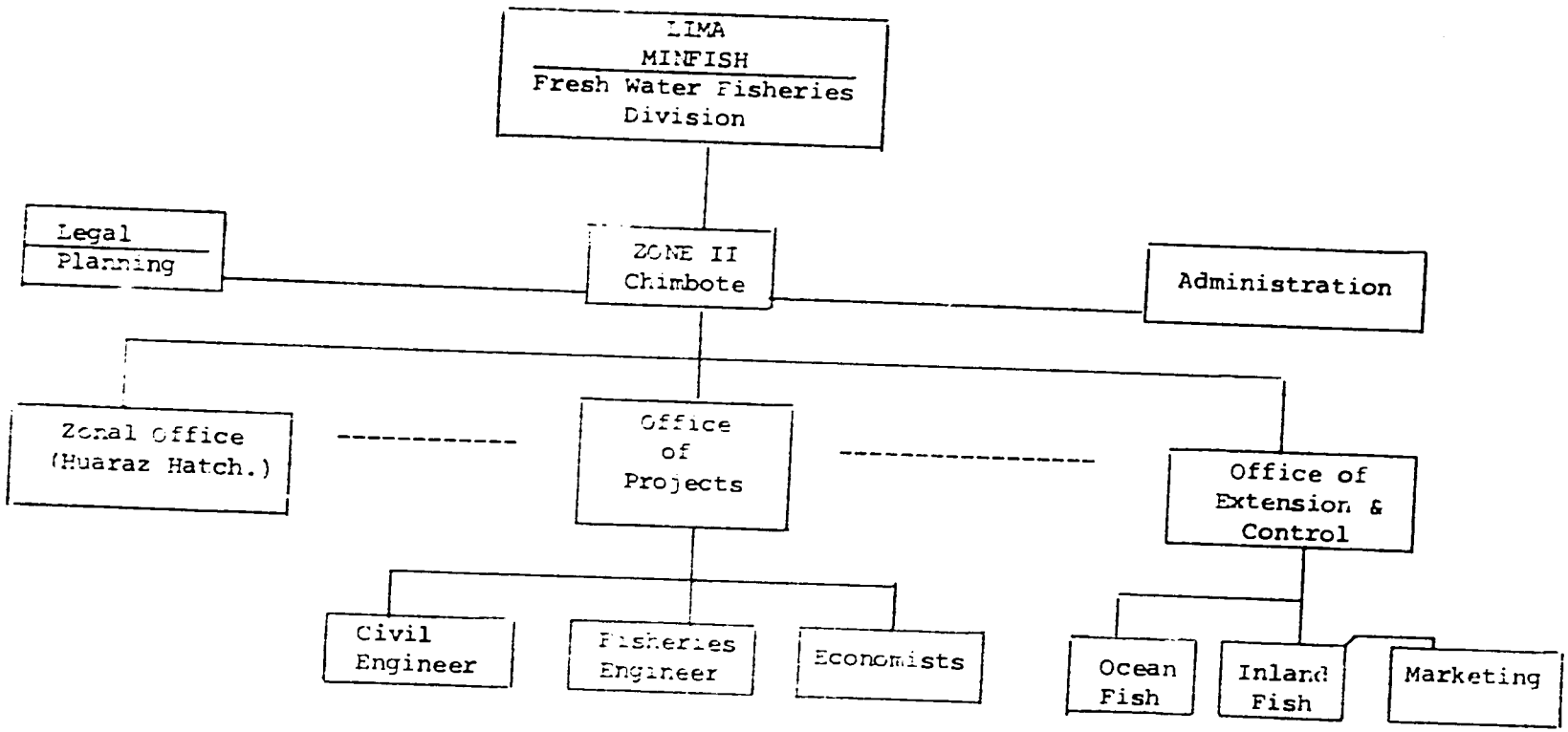
DISTRIBUTION OF AID GRANT FUNDS
(IN FOREIGN EXCHANGE AND LOCAL CURRENCY)

Item	FX	LC	TOTAL
Sub-project investments	95,496	145,104	240,600
Equipment, machinery, materials	70,496	83,504	
Installation costs	1,500	-	
Three trucks	23,500	-	
Operating expenses	-	61,600	
T.A. and Training	205,450	19,000	224,450
U.S. Technical services (33 weeks)	82,500	-	
Training of GOP Technicians	70,000	-	
Farmer training: (18 weeks)		11,000	
Training and research equipment	21,950	-	
Promotion Program: truck and operating costs	15,000	8,000	
Contingencies and shipping costs	16,000		
TOTAL:	300,946	164,104	465,050

LIST OF IMPORTED CAPITAL ITEMS

	Item	Cost ($)
1	Pelleting Plant (Roller mill, mixer, vibrating screens, and pellet mill.)	30,000
1	Filter for ova room	10,000
-	Laboratory equipment	10,000
10	Vertical incubators	1,500
-	Ova	1,600
2	Diesel Generators	4,000
5	Vehicles (3 trucks)	23,500
2	Truck tanks	3,536
2	Rubber rafts with motor	2,100
2	Motor boats	2,460
12	Gill nets	2,400
1	Promotion truck	15,000
-	Equipment for lake studies	6,350
-	Equipment for processing demonstration	1,000
2	Four wheel drive vehicles	12,500
-	Office equipment	2,000
-	Accounting equipment	3,000
	Contingencies and shipping costs	16,000
	TOTAL	$146,946

CHART IV-A-1


LIMA
MINFISH
Fresh Water Fisheries Division
Legal
Planning
ZONE II
Chimbote
Administration
Zonal Office
(Huaraz Hatch.)
Office
of
Projects
Office of
Extension &
Control
Civil
Engineer
Fisheries
Engineer
Economists
Ocean
Fish
Inland
Fish
Marketing

ANNEX "C"

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Project Title & Number: Fresh Water Fisheries Development - Project Nº 527-0144

Life of Project: From FY 77 to FY 8C
Total U S Funding: $465,000
Date Prepared: 12/16/76

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: To increase productivity, incomes, and employment and improve nutrition among the rural poor. (The project will particularly benefit target groups within the sierra rural poor population of Peru by increasing their incomes and their consumption of animal protein.)	**Measures of Goal Achievement:** 1. Increased per capita income in the sierra. 2. Increased consumtpion of animal proteins in the sierra	1. INP Statistics 2. MinFood, MinFish and MinEcon reports. 3. INP and Ministry of Health nutrition surveys.	**Assumptions for achieving goal targets:** 1. Continued high GOP priority for increased production of food. 2. GOP priority support of programs for improvement of conditions and opportunities for "campesinos" will be continued.
Project Purpose: To establish a viable model for increasing trout production in Peru by: (a) demonstrating that intensive hatchery production and sale of trout is an economically feasible enterprise constituting an additional source of income for subsistence farmers; and (b) demonstrating that extensive production of lake trout for direct farm consumption can significantly improve the protein diet of the small farmers.	**Conditions that will indicate purpose has been achieved:** End of project status. 1. A viable model exists (which can be replicated based on the "Ancash experience") for trout production. 2. Trout feed to meat conversion ration will have been reduced from the present 4-5/1 to 2/1. 3. Genetically improved trout species will have been introduced. 4. Community fish farms will return profits by year 4. 5. Animal protein consumption deficit of community members will have been reduced.	Project level verification: 1. Technical economic and financial evaluation of community sub-projects. 2. Evaluation of feed inputs and trout growth rates. 3. Performance records of imported ova at Huaraz hatchery 4. Community enterpriges' accounting records. 5. Records of consumption and marketing of lake trout.	**Assumptions for achieving purpose:** 1. Interest of farmers in increasing their net cash income. 2. Trout price will be maintained at least at S/.80.00 per kg. by EPSEP. 3. EPSEP will buy all the fresh trout output of the project rearing stations. 4. Beneficiaries will respond positively to GOP promotional campaign for increased consumption of trout.
Outputs: 1. Establishment of a trout feed pelleting plant. 2. Huaraz hatchery improved and producing genetically improved trout species. 3. Community fish farm established at Huashao. 4. Community fish farm expanded at Acopalca. 5. Lake Purhuay stocked and producing. 6. Lake Querococha stocked and producing. 7. Trained GOP and Community technicians.	**Magnitude of Outputs:** 1. 360 MT/yr of balanced feed. 2. 2 million fingerlings per year. 3. 36 MT/yr of trout produced and marketed. 4. 36 MT/yr of trout produced and marketed 5. 10.8 MT/yr produced and consumed in their majority by community members. 6. 10.8 MT/yr produced and consumed in their majority by community members. 7. 2 technicians with MS degrees, 6 technicians upgraded through invitational travel and 20 technicians trained in-country.	1. Plant Production data. 2. Hatchery Production data. 3. Fish Farm Production and Marketing records. 4. Fish Farm Production and Marketing records. 5. Harvesting records and evaluation survey. 6. Harvesting records and evaluation survey. 7. Participant Training records.	**Assumptions for achieving outputs:** 1. Feed inputs remain readily available at reasonable cost. 2. No significant new pollution sources will occur up-stream of hatchery water intake canal. 3. Community interest in trout raising will continue high. Communities will responsibly manage the enterprises in accordance with the advice of GOP technicians 4. Community members will choose to consume the available trout rather than to market it for the marginal gain. 5. GOP officials will release personnel for training.
Inputs: A.I.D. $465,000 Technical Assistance 33 weeks Training abroad 56 pm Investment support (equipment, vehicles, materials, installation costs, etc.) 240,500 Local training, research equipment and trout consumption promotion 71,950	**Implementation Target (Type and Quantity)** G.O.P. $366,474 Personnel (full time) 54,330 Feed plant operating exp. 22,000 Installations of Huaraz Hatchery 94,608 Operating expenses of Huaraz hatchery 36,924 Regional fisheries installations, vehicles, part-time personnel, etc 178,612	- USAID records - Controller, Training and other project documentation - Project evaluation - Ministry of Fisheries Accounts and records	**Assumptions for providing inputs:** - Qualified experts available. - AID funds available as planned. - GOP economic situation permits provision of counterpart funds as required.

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Ministerio de Pesquería
Despacho Ministerial

Lima, 6 de Abril de 1976.

Oficio N° 0419-76-PE/DM/DGE.

USAID/LIMA
MAIL ROOM
19 APR 1976
RECEIVED

Señor
Leonard Yaeger
Director Interino
Agencia para el Desarrollo Internacional.

Asunto : Asistencia Técnica para financiamiento de Proyectos para la Pesquería en Aguas Continentales.

Referencia : a) Su carta del 22 - 03 - 76.

Tengo el agrado de dirigirme a usted, para agradecer en primer lugar el ofrecimiento de Asistencia Técnica de la A.I.D. por un monto de $/- USA 450,000.- y luego, para manifestarle que de acuerdo a la conversación con funcionarios autorizados de la A.I.D., sobre la definición de la prioridad sobre los proyectos propuestos por las Oficinas Regionales de Chimbote y Puno, mi Despacho considera conveniente conceder su aprobación a la ejecución del proyecto en la Zona Afectada del departamento de Ancash. Para tal fin, actuará, en representación del Ministerio de Pesquería el Director de la Oficina Regional II - Chimbote, Ingeniero HUGO GALLEGOS PANIAGUA.

Action	RD
Info	AKM
	CON

Atentamente,

Due Date 4/27

Action:	NAN
Date	Initials
4/20/76	

El Contralmirante A.P.
FRANCISCO MARIATEGUI ANGULO
Ministro de Pesquería.

ANNEX "E"

Table 7-1. Time distribution of Capital, M&O, Production Costs, and gross revenues of Pelleting Plant Sub-Project (in dollars) 1/

Item/Year	1	2	3	4	5	6	7	8	9	10
A. Capital Items	49,300					8,500				
1. Pelleting Plant	30,000									
2. Installation Cost	1,500									
3. Metal Building	9,800									
4. Truck	6,500					6,500				
5. Office Equipment	2,000					2,000				
B. M&O	19,222	25,145	25,145	25,145	25,145	25,145	25,145	25,145	25,145	25,145
1. Salaries (Adm.)	1,846	3,692	→						→	3,692
2. Wages (5 Workers)	2,076	4,153	→						→	4,153
3. Maintenance of Equipment	1,000	2,000	→						→	2,000
4. Consultant Fee	3,000									
5. Land Rental	7,300	→							→	7,300
6. Utilities	4,000	8,000	→						→	8,000
C. Prod. Costs	18,150	52,950	69,600	69,600	69,600	69,600	69,600	69,600	69,600	69,600
1. Fish Meal	11,650	34,965	46,620	→					→	46,620
2. Agr. by products	5,000	14,985	19,980	→					→	19,980
3. Bags, tools, etc.	1,500	3,000	→						→	3,000
D. Gross Costs	87,172	78,045	94,745	94.745	94,745	103,245	94,745	94,745	94,745	94,745
E. Gross Return	27,540	82,620	110,160	110,160	110,160	110,160	110,160	110,160	110,160	110,160
Sales Value 2/	27,540	82,620	110,160	→					→	110,160

1/ Project life: 10 years
2/ Shadow price of US$306 x MT.

Planned development of output: 1st yr.= 90 MT; 2nd yr. = 270 MT; 3rd to 10th yrs. = 360 MT

TABLE B-2. BENEFIT-COST COMPUTATIONS FOR PELLET PLANT SUB-PROJECT (IN DOLLARS) 1/

Year	Sub-Project Costs				DF 15 %	Present Worth 15%	Sub-Project Gross Benefits 1/	Present Worth 15%
	Capital Items	M & O Costs	Production Costs	Gross Costs				
1	49,800	19,222	18,150	87,172	.870	75,839	27,540	23,959
2	-	25,145	52,950	78,095	.756	59,039	82,620	62,460
3			69,600	94,745	(1.727)	163,624	110,160	373,772
4						-		-
5								
6	8,500			103,245	.432	44,601		
7	-			94,745	(1.234)	116,915		
8						-		
9								
10								
						460,018		460,191

a) $B/C = \frac{460,191}{460,018} = 1.00$

1/ Basic data from Table B-1.

TABLE B-3 - ANNUAL DISTRIBUTION OF CAPITAL, M & O, PRODUCTION COSTS, AND GROSS REVENUES OF HUARAZ HATCHERY SUB-PROJECT (IN DOLLARS) 1/

Item/Year	1	2	3	4	5	6	7 → 10	11 → 20	21 → 25
A. CAPITAL	56,286					10,386			
1 Special truck	8,500					8,500			
500 gall tank	1,886					1,886			
1 Km. water canal	20,000					-			
Filter for ovas	10,000								
Improve Storage	1,600								
Renovate brood area	2,000								
Complete laboratory	10,000								
10 Vertical incubators	1,500								
Import ovas	800								
B. M & O	24,319	24,319	24,319	24,319	24,319	24,319	24,319 → 24,319	24,319 → 24,319	24,319 → 24,319
Wages and Salaries	24,319 →								→ 24,319
C. PRODUCTION COSTS	7,781	15,562	17,505	18,481	18,481	18,481	18,481 → 18,481	18,481 → 18,481	18,481 → 18,481
D. GROSS COSTS	88,386	39,881	41,824	42,800	42,800	53,186	42,800 → 42,800	42,800 → 42,800	42,800 → 42,800
E. GROSS REVENUE 2/	23,089	46,177	51,943	54,839	54,839	54,839	54,839 → 54,839	54,839 → 54,839	54,839 → 54,839
Sales value	23,089	46,177	51,943	54,839 →					→ 54,839

1/ Project life: 25 years

2/ Planned development of output: 1st year = 1,818 kg. of fingerlings, 2nd year = 3,636, 3rd year = 4,090, 4th - 25th years = 4,318 per year. One kg. contains 440 fingerlings. Shadow selling price = US$12.70 x kg of fingerlings.

TABLE B-4

BENEFIT COST COMPUTATIONS FOR HUARAZ HATCHERY SUB-PROJECT (in dollars)

Year	Sub-Project Costs							
	Year Capital items	M & O costs	Production	Gross	DF 15%	Present Worth 15%	Sub-Project Gross Benefits	Present Worth 15%
1	56286	24319	7781	88386	.870	76895	23089	20087
2			15562	39881	.756	30150	46177	34910
3			17505	41827	.658	27520	51943	34179
4			18481	42800	.572	24482	54839	229281
5				42800	.497	21272		-
6	10386			42800	.432	22976		
7				53186	[2.680]	114704		
8				42800		-		
9								
10								
↓								
25								
						317999		318457

a) B/C = $\frac{(318457)}{(317999)}$ = 1.00

TABLE B-5 - Annual Distribution of Capital, Maintenance and Operation, Production Costs, and Gross Revenues of Huashao Sub-Project (in dollars) 1/

ITEM/YEAR	1	2	3	4 → 10	11 → 20	21 → 25
A. CAPITAL	14650			5000	5000	
1. Complete construction of planned fish farm	9250					
2. Fences (wire, etc.)	400					
3. Diesel Generator (10 Kw)	2000			2000	2000	
4. Accounting Equipment	3000			3000	3000	
B. M. & O.	2969	4092	4092	4092 → 4092	4092 → 4092	4092 → 4092
1. Salary (Adm.)	1846 →					→ 1846
2. Wages (5 workers)	1123	2246 →				→ 2246
C. Production Costs	15264	23626	23186	30530 → 30530	30530 → 30530	30530 → 30530
1. Fingerlings 2/	2791	4187	5583 →			→ 5583
2. Feeds 3/	11016	16524	14688	22032 →		→ 22032
3. Medicine & Chemicals	1107	2215 →				→ 2215
4. Miscellaneous	350	700 →				→ 700
D. Gross Costs	32883	27718	27278	34622 → 39622	34622 → 39622	34622 → 34622
E. Gross Revenues		22140	29520	44280 → 44280	44280 → 44280	44280 → 44280
Sales Value 4/		22140	29520	33280 → 44280	44280 → 44280	44280 → 44280

1/ Project life: 25 years.
2/ Purchased from Huaraz hatchery at shadow price of US$12.70 x Kg. of fingerlings.
3/ Purchased from Pelleting plant at shadow price of US$306 x M.T.
4/ Fresh trouts sold at current fixed price of US$1.23 x Kg. (80 Soles per Kg.).
Planned development of output: 2d. year = 18 MT fresh trout; 3d. yr. = 24 MT: 4th-25th yrs. = 36 MT per year. Feed-to-meat conversion ratio 2/1 attained by 4th yr.

TABLE B-6 - BENEFIT-COST AND ECONOMIC RATE OF RETURN COMPUTATIONS FOR HIRAHAO FISH FARM SUB-PROJECT (IN DOLLARS) 1/

Year	Sub-project Costs: Capital items	M & O costs	Production costs	Gross costs	D.F. 15%	Present worth 15%	Sub-project gross benefits	Present worth 15%	Cash flow	Present worth 15%	Present worth 20%
1	14,650	2,969	15,264	32,883	.870	28,608	-	-	(32883)	(28,608)	(27,392)
2	-	4,092	23,626	27,718	.756	20,955	22,140	16,738	(5578)	(4,217)	(3,871)
3			23,186	27,278	.658	17,949	29,520	19,424	2242	1,475	1,298
4			30,530	34,622	[2.486]	86,139	44,280	185,130	9658	24,029	20,146
5						-		-		-	-
6											
7											
8											
9											
10	5,000			39,622	.247	9,787			4,658	1,151	755
11	-			34,622	[1.180]	40,854			9,658	11,396	6,548
12						-				-	-
13											
14											
15											
16											
17											
18											
19											
20	5,000			39,622	.061	2,417			4,658	284	121
21	-			34,622	[.205]	7,098			9,658	1,980	753
22						-				-	-
23											
24											
25											
						213,807		221,292		7,490	(1,642)

a) $B/C = \frac{221,292}{213,807} = 1.04$

b) Economic rate of return $= 15 + 5 \left(\frac{7,490}{9,132} \right) = 19.10$

1/ Basic data from Table B-5

TABLE B-7 ANNUAL DISTRIBUTION OF CAPITAL, MAINTENANCE AND OPERATION, PRODUCTION COSTS, AND GROSS REVENUES OF LAKE QUEROCOCHA SUB-PROJECT 1/
(In Dollars)

Item/Year	1	2	3	4	5	6	7	8	9	10
A. Capital	7,430	--		--	2,430	--				--
1. Construct Guard house and dock	4,500	--			--					
2. Boat Unit	780	--			780					
3. Boat Motor 10HP	450	--			450					
4. Gill nets	1,200				1,200					
5. Miscellaneous	500				--					
B. Maintenance & Op.	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175
1. Salary (Adm.)	1,846	→							→	1,846
2. Wages (3 workers)	1,329	→							→	1,329
C. Production Costs	3,467	1,587	1,587	1,587	1,587	1,587	1,587	1,587	1,587	1,587
Fingerlings	3,467	1,587	→						→	1,587
D. Gross Costs	14,072	4,762	4,762	4,762	7,192	4,762	4,762	4,762	4,762	4,762
E. Gross Revenues	---	6,642	13,284	13,284	13,284	13,284	13,284	13,284	13,284	13,284
Sales Value 2/	---	6,642	13,284	→					→	13,284

1/ Project Life: 10 years.
2/ Trout selling price considered: US$1.23 per Kg.

Planned Development of output: Year 1 = 0; Year 2 = 5.4 (MT); Years 3-10 = 10.8 (MT).

TABLE B-8 BENEFIT-COST AND ECONOMIC RATE OF RETURN COMPUTATIONS FOR LAKE QUEROCOCHA SUB-PROJECT 1/
(IN DOLLARS)

Year	Sub-Project Costs: Capital Items	Maint. & Op. Costs	Production Costs	Gross Costs	DF 15%	Present Worth 15%	Sub-Project Gross Benefits	Present Worth 15%
1	7,430	3,175	3,467	14,072	0.869	12,228	--	--
2	--		1,587	4,762	(1,985)	9,453	6,642	5,021
3					--	--	13,284	45,074
4								
5	2,430			7,192	0.497	3,574		
6				4,762	1.666	7,933		
7						-		
8								
9								
10								
						33,188		50,095

a) B/C = $\frac{50,095}{33,188}$ = 1.51

b) ERR > 50%

1/ Basic data from Table B-7

TABLE B-9 ANNUAL DISTRIBUTION OF CAPITAL, M & O, PRODUCTION COSTS, AND GROSS REVENUES OF ACOPALCA FISHFARM SUB-PROJECT (in dollars) 1/

Item / Year	1	2	3	4	5	6→10	11	12→20	21→25
A. Capital	58,680								
a) Fishfarm						3,650	4,430	3,650	
1. Complete const. of 12 raceways	25,000								
2. Pond area for brood stock	4,500								
3. Feed storage facility	2,000								
4. Improve guard st.-office	2,500								
5. Facility for process. and ship.	3,500								
6. Develop road to lake	2,000								
7. Fences	1,800								
8. Diesel Generator (10 KW)	2,000								
9. Transport tank (300 gallons)	1,650					2,000		2,000	
10. Truck	8,500					1,650		1,650	
11. Import Ovas	800								
b) Lake Purhuay									
1. Boat	780						780		
2. Boat motor (10 HP)	450						450		
3. Gillnets	1,200						1,200		
4. Boat dock	1,500						1,500		
5. Miscellaneous	500						500		
B. M & O	2,969	4,092	4,092	4,092	4,092	4,092→4,092	4,092	4,092→4,092	4,092→4,092
Salary (Adm.)	1,846	→	→	→	→	→	→	→	→1,846
Wages (5 workers)	1,123	2,246	→	→	→	→	→	→	→2,246
C. Production Costs	12,473	24,947	35,963	24,947	24,947	24,947→24,947	24,947	24,947→24,947	24,947→24,947
Feeds 2/	11,016	22,032	33,048	22,032	→	→	→	→	→22,032
Medicines, Chemicals	1,107	2,215	→	→	→	→	→	→	→2,215
Miscellaneous	350	700	→	→	→	→	→	→	→700
D. Gross Costs	74,122	29,039	40,055	29,039	29,039	29,039	32,689	33,469	29,039→32,689	29,039→29,039
E. Gross Revenues 3/	-	28,782	57,564	57,564	57,564	57,564	57,564	57,564	57,564→57,564	57,564→57,564
a) Fishfarm sales	-	22,140	44,280	→	→	→	→	→	→	→44,280
b) Lake sales	-	6,642	13,284	→	→	→	→	→	→	→13,284

1/ Project life: 25 years

2/ Feed purchased from Pelleting plant at shadow price of U.S. $306 x MT.

3/ Fresh trout sold at U.S. $1.23 x Kg.

fish farm

a) Development of/output: 2d. year = 18 MT of fresh trout; 3rd. - 25th yrs. = 36 MT per year. Feed-to-meat conversion ratio 2/1 attained by 4th yr.

b) Development of lake output: 2nd yr. = 5.4 MT, 3rd to 25th yrs. - 10.8 MT per year.

TABLE B-10 BENEFIT COST AND ECONOMIC RATE OF RETURN COMPUTATIONS
FOR ACOPALCA FISHFARM SUB-PROJECT (in dollars) 1/

Year	Sub-project costs					Sub-project				
	Cap. Inputs	M & O Costs	Production Costs	Gross Costs	P W 15%	Gross Benefit	P W 15%	Cash Flow	P W 25%	P W 30%
1	58,680	2,969	12,473	74,122	64,412	-		(74,122)	(59,297)	(56,999)
2	-	4,092	24,947	29,039	21,953	28,782	21,759	(257)	(164)	(151)
3			35,963	40,055	26,316	57,564	278,552	17,509	8,964	7,966
4			24,947	29,039	72,249		-	28,525	43,101	34,315
5										
6										
7										
8										
9										
10	3,650			32,689	8,074			24,875	2,661	1,791
11	4,430			33,469	7,162			24,095	2,048	1,325
12	-			29,039	28,022			28,525	8,471	4,649
13										
14										
15										
16										
17										
18										
19										
20	3,650			32,689	1,994			24,875	273	124
21	-			29,039	5,952			28,525	884	370
22										
23										
24										
25										
					236,134		300,311		6,941	(6,610)

a) B/C = 1.27 b) ERR = 25 + 5 (6941/13551) = 27.56%

1/ Basic data from Table B-9

TABLE B-1 - CAPITAL, M & O, PRODUCTION COSTS AND GROSS REVENUES OF INLAND FISHERIES PROJECT (IN DOLLARS)

Item / Year	1	2	3	4	5	6	7 ⟶ 10	11	12	13	14	15	16 ⟶ 20	21	22	23	24	25
A. CAPITAL	186,846	-	-	-	2,430	18,886	-	11,080	4,430	-	-	-	2,430	-	1,080			2,430
1. Pellet plant	49,800					8,500												-
2. Huaraz hatchery	56,296					10,386												
3. Huashao fish farm	14,650							5,000										
4. Querococha Lake	7,430				2,430			2,430				2,430						2,430
5. Acopalca fish farm and lake	58,680							3,650	4,430									
B. M & O	52,654	60,823	⟶													⟶		60,823
1. Pellet plant	19,222	25,145	⟶														⟶	25,145
2. Huaraz hatchery	24,319	⟶															⟶	24,319
3. Huashao fish farm	2,969	4,092	⟶														→	4,092
4. Querococha lake	3,175	⟶															⟶	3,175
5. Acopalca fish farm and lake	2,969	4,092	⟶														⟶	4,092
C. PRODUCTION COSTS	60,122	124,324	222,810	141,722	⟶												⟶	141,722
1. Pellet plant	18,150	52,950	69,600	⟶													⟶	69,600
2. Huaraz hatchery	7,781	15,562	17,505	18,481	⟶												⟶	18,481
3. Huashao fish farm	18,251	30,001	29,278	27,830	⟶												⟶	27,830
4. Querococha lake	3,467	864	⟶														⟶	864
5. Acopalca fish farm and lake	12,473	24,947	35,963	24,947	⟶												⟶	24,947
D. GROSS COSTS	299,622	185,147	283,633	202,515	204,975	221,431	202,545 ⟶ 213,625	206,975	202,545	202,545	202,545	204,975	202,545 ⟶ 213,625	202,545	202,545	202,545	202,545	204,375
E. GROSS REVENUES	50,629	186,361	262,471	280,127	⟶												⟶	280,127
1. Pellet plant	27,540	82,620	110,160	⟶													⟶	110,160
2. Huaraz hatchery	23,089	46,177	51,943	54,839	⟶												⟶	54,839
3. Huashao fish farm	-	22,140	29,520	44,280	⟶												⟶	44,280
4. Querococha lake	-	6,642	13,284	⟶													⟶	13,284
5. Acopalca fish farm and lake	-	28,782	57,564	⟶													⟶	57,564

TABLE B-II BENEFIT COST COMPUTATIONS FOR FRESH WATER FISHERIES (in thousands of dollars) 1/

Year	Project Costs							
	Capital Inputs	M & O	Production Costs	Gross Costs	P W 15%	D F 15%	Project Gross Benefits	P W 15%
1	186.8	52.7	60.1	229.6	199.5	.869	50.6	44.0
2	-	60.8	124.3	185.1	140.1	.756	186.4	141.0
3			222.8	283.6	186.3	.657	262.5	172.5
4			141.7	202.5	115.6	.571	280.1	1,171.0
5	2.4			204.9	102.0	.497		
6	18.9			221.4	95.6	.432		
7				202.5	200.0	(.987)		
8								
9								
10	11.1			213.6	52.8	.247		
11	4.4			206.9	44.3	.214		
12	-			202.5	99.4	(.491)		
13								
14								
15	2.4			204.9	25.0	.122		
16	-			202.5	83.4	(.412)		
17								
18								
19								
20	11.1			213.6	13.0	.061		
21	-			202.5	35.2	(.174)		
22								
23								
24								
25	2.4			204.9	6.4			
					1,398.6			1,528.5

B/C = 1.1

1/ Basic data from Tables B-1 through B-10.

TABLE F- . FINANCIAL PROJECTIONS OF THE PELLETING PLANT SUB-PROJECT

	1	2	3	4	5	6	7	8	9	10
OUTFLOWS										
Capital Investments	49,300	-	-	-	-	3,500	-			
Salaries, Wages, fees	6,922	7,845	7,845	-	-	7,845	7,845			
Production Inputs	16,250	52,950	69,600	-	-	69,600	69,600			
Land, Utilities and Materials	12,300	17,300	17,300	-	-	17,300	17,300			
Sub-total:	87,172	78,095	94,745			103,245	94,745			
Contingencies at 5%	4,359	3,905	4,737			5,162	4,737			
TOTAL OUTFLOWS:	91,531	82,000	99,482	99,482	99,482	108,407	99,482	99,482	99,482	99,482
INFLOWS										
Sales Revenues 1/	24,930	74,790	99,720	99,720	99,720	99,720	99,720	99,720	99,720	99,720
AID Grant Funds	51,800	-								
GOP Contribution	14,801	7,210								
Cash Surplus	-	-		238	476	714		238	476	714
TOTAL INFLOWS	91,531	82,000	99,720	99,958	100,196	100,434	99,720	99,958	100,196	100,434
Net Cash Balance	0	0	238	476	714	(7,973)	238	476	714	952

1/ Assumes sales price at $277/MT; annual sales volume at 90 MT in Year 1, 270/MT in Year 2, and 360/MT from Year 3 - 10.

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TABLE P - 2 PROJECTIONS OF THE HUARAZ HATCHERY SUB-PROJECT

		1	2	3	4	5	6	7	8	9	10
OUTFLOWS	Capital Investments	56,286	-				10,386	-			
	Salaries & Wages	24,319	24,319	24,319	24,319		24,319	24,319			
	Production Inputs	7,781	15,562	17,505	18,481		18,481	18,481			
	Sub-Total	88,386	39,881	41,824	42,800		53,186	42,800			
	Contingencies at 5%	4,419	1,994	2,091	2,140	→	2,659	2,140	→		
	TOTAL	92,805	41,875	43,915	44,940	44,940	55,845	44,940	44,940	44,940	
INFLOWS	Sales Revenues 1/	19,998	39,996	44,990	47,498	47,498	47,498	47,498	47,498	47,498	47,498
	AID Grant Funds	55,800	-								
	GOP Contribution 2/	17,007	1,879	↓							
	Cash Surplus	-	-		1,075	3,633	6,191	(2,156)	402	2,960	5,518
	TOTAL INFLOWS	92,805	41,875	44,990	48,473	51,131	53,689	45,342	47,900	50,458	53,016
	NET CASH BALANCE	0	0	1,075	3,633	6,191	(2,156)	402	2,960	5,518	8,076

1/ Assumes sales price at $11.00/kg. ($0.025/fingerling); production at 1818 kg. in Year 1, 3636 in Year 2, 4090 in Year 3, and 4318 from year 4 on.

2/ This includes $2,300 in construction costs in year 1 and the balance in budget support for operating expenses. The GOP is currently providing an estimated $9,231 annually in budgeted funds to finance operating expenses; required GOP support of the hatchery as shown here reflects a reduction from current budget support after project Year 1.

TABLE F-3 FINANCIAL PROJECTIONS OF THE HUASHAO FISH FARM SUB-PROJECT.

		1	2	3	4	5	6	7	8	9	10
OUTFLOWS	Capital Investments	14,650	-								5,000
	Salaries and Wages	2,969	4,092	4,092	4,092						4,092
	Production Inputs 1/	13,849	21,503	21,051	27,699						27,699
	Sub-Total	31,468	25,595	25,143	31,791						36,791
	Contingencies at 5%	1,703	1,280	1,257	1,590						1,840
	TOTAL OUTFLOWS	33,171	26,875	26,400	33,381	33,381	33,381	33,381	33,381	33,381	38,631
INFLOWS	Sales Revenues 2/	-	22,140	29,520	44,280	44,280	44,280	44,280	44,280	44,280	44,280
	AID Grant Funds	32,271	4,735								
	Community Contribution 3/	900									
	Cash Surplus				3,120	14,019	24,918	35,817	46,716	57,615	68,514
	TOTAL INFLOWS	33,171	26,875		47,400	58,299	69,198	80,097	90,996	101,895	112,794
	Net Cash Balance	0	0	3,120	14,019	24,918	35,817	46,716	57,615	68,514	74,163

1/ Assumes purchase price of feed at $277/MT and of fingerlings at $11/kg.

2/ Assumes sales price of trout at $1.23/kg; production at 18 MT in Year 2, 24 MT in Year 3, and 36 MT in Year 4 and thereafter.

3/ Represents community labor for construction costs.

TABLE F-4 FINANCIAL PROJECTIONS OF LAKE QUEROCOCHA SUB-PROJECT

		1	2	3	4	5	6	7	8	9	10
OUTFLOWS	Capital Investments	7,430									
	Salaries and Wages	3,175	3,175			3,175					
	Production Inputs 1/	3,003	1,375			1,375					
	Sub-Total	13,608	4,550			4,550					
	Contingencies at 5%	680	227	→		227	→				
	TOTAL OUTFLOWS	14,288	4,777	4,777	4,777	4,777	4,777	4,777	4,777	4,777	4,777
INFLOWS	Sales Revenues 2/		2,484	4,968	4,968	4,968	4,968	4,968	4,968	4,968	4,968
	AID Grant Funds	13,788	2,293								
	Community Contributions 3/	500									
	Cash Surplus				191	382	573	764	955	1,146	1,337
	TOTAL INFLOWS	14,288	4,777	4,968	5,159	5,350	5,541	5,732	5,923	6,114	6,305
	Net Cash Balance	0	0	191	382	573	764	955	1,146	1,337	1,528

1/ Assumes purchase price of fingerlings at $11/kg, (or $0.025/fingerling).

2/ Assumes sales price of trout at $0.46/kg; production at 5.4 MT in Year 2, and 10.8 MT/Year in Years 3-10.

3/ Represents community labor for construction.

TABLE F - 5 FINANCIAL PROJECTIONS OF ACOPALCA FISH FARM / LAKE PURHUAY

		1	2	3	4	5	6	7	8	9	10
OUTFLOWS	Capital Investments: Farm	54,250									3,650
	Capital Investments: Lake	4,430									4,430
	Salaries and Wages	2,969	4,092	4,092	4,092						4,092
	Production Inputs 1/	11,429	22,859	32,831	22,859						22,859
	Sub-total	73,078	26,251	36,923	26,951						35,031
	Contingencies at 5%	3,654	1,348	1,846	1,348						1,752
	TOTAL OUTFLOWS	76,732	28,299	38,769	28,299	28,299	28,299	28,299	28,299	28,299	36,783
INFLOWS	Sales Revenues: Farm 2/		22,140	44,280	49,248	49,248	49,248	49,248	49,248	49,248	49,248
	Sales Revenues: Lake 3/		2,484	4,968							
	AID Grant Funds	69,132	175								
	Community Contribution 4/	7,600	3,500								
	Cash Surplus				10,479	31,428	52,377	73,326	94,275	115,224	136,173
	TOTAL INFLOWS	76,732	28,299	49,248	59,727	80,676	101,625	122,574	143,523	164,472	185,421
	Net Cash Balance	0	0	10,479	31,428	52,377	73,326	94,275	115,224	136,173	148,638

1/ Assumes purcase price of feed at $277/MT; consumption of feed at 36/MT in Year 1, 72/MT Year 2, 108/MT in Year 3 and 72/MT for Year 4 on.

2/ Assumes sales price of trout at $1.23/kg; production of trout at 18/MT in Year 2, 36 MT/yr in Years 3-10.

3/ Assumes sales price of trout at $.46/kg, production at 5.4 MT in Year 2, 10.8 MT/Yr in Years 3 - 10.

4/ Includes community laborfor construction in Year 1 (estimated cost of $4,100) and salaries and wages currently paid to workers under existing operations ($3,500 per year).

5/ These replacement costs are expected in year 11; they have been included in Year 10 for the purposes of this analysis only.

TABLE F-6 - SUB-PROJECT INVESTMENT COSTS (IN US$ 000)

Application by Source and Category	Total	Feed Plant	Huaraz Hatchery	Huashao Farm	Lake Querococha	Acopalca Complex
A. Equipment, machinery, materials: AID	154.0	41.8	45.4	13.7	7.0	46.1
B. Construction and installation costs: Total	9.3	1.5	2.3	0.9	0.5	4.1
A.I.D.	1.5	1.5	-			
G.O.P	2.3	-	2.3	-	-	-
Communities	5.5	-	-	0.9	0.5	4.1
C. Vehicles: A.I.D.	23.5	6.5	8.5	-	-	8.5
D. Start-up operating costs: Total	96.6	24.0	18.5	23.3	9.1	21.7
A.I.D.	51.0	2.0	1.9	23.3	9.1	14.7
G.O.P	38.6	22.0	16.6	-	-	-
Communities	7.0	-	-	-	-	7.0
E. SUB-PROJECT TOTALS:	283.4	73.8	74.7	37.9	16.6	80.4
Total A.I.D. Share: 1/	230.0 (81%)	51.8 (70%)	55.8 (75%)	37.0 (98%)	16.1 (97%)	69.3 (86%)
Total G.O.P Share:	40.9 (14%)	22.0 (30%)	18.9 (25%)	-	-	-
Total Community Share:	12.5 (5%)	-	-	0.9 (2%)	0.5 (3%)	11.1 (14%)

1/ $10,000 contingency item not included.

ANNEX C

Draft Annex 1 to Project Agreement

Detailed Description of Fresh Water Fisheries Development Project

The long range objective of the project aims at increasing the incomes of small farmers in the Peruvian sierra through the introduction and expansion/improvement of commercial fish farming as an addition to their regular agricultural activity. It is also expected to contribute to improved nutrition for the rural poor through progressive introduction of trout into the diet of the rural populace.

Specifically, the project is designed to establish a viable model for increasing inland trout production in Peru. A key element in the project design is the development and production of a low-cost, balanced feed for trout. It is anticipated that use of a balanced feed will reduce the present feed to meat conversion ratio of over four to one to two to one. Additionally, genetically improved trout species will be introduced under the project.

There will be six major project outputs, as follows:

1. The establishment of pilot, medium capacity trout feed pelleting plant with an ultimate capacity of one metric ton per day. This facility will develop and market the low cost, balanced feed critical to reducing the feed/meat conversion ratio, and thus the overall profitability of community fish production enterprises.

2. The improvement of the fish hatchery in Huaraz. This hatchery will produce fingerlings for two of the sub-project areas and will be the instrumentality for introducing genetically improved trout species.

3. Two community trout fish farms (rearing stations) will be established, one in the Huaylas Valley (Huashao), the other in the Conchucos Valley (Acopalca). These rearing stations will produce for the commercial markets and will represent an important source of income for the participating communities.

4. Two community controlled lakes will be stocked, one each in the Huaylas (Catac) and Conchucos Valleys (Acopalca). These trout will be harvested by the communities for self-consumption and for regional marketing of the surplus.

These six activities are grouped as five sub-projects for implementation purposes, as one of the rearing stations and one of the lakes will both

be administered by (and will benefit) the farmer community of Acopalca. At the level of the community then the project provides three sub-models for demonstration and evaluation purposes:

Sub-model A - Rearing station only (Huashao)
Sub-model B - Lake production only (Catac)
Sub-model C - Combined rearing station and lake production

For execution of these activities, appropriate training will be provided to technicians of the Ministry of Fisheries and the cooperating communities in such areas as fish culture, nutrition, biology, fish processing and business administration. Promotion of local fish consumption will also be undertaken by the Ministry of Fisheries.

AID inputs will finance required equipment, commodities and vehicles supporting implementation of planned activities in the approximate amount of $240,000. Thirty-three weeks of short term U.S. technical assistance costing approximately $85,000 will be provided, primarily in the first year of project activities. Fifty-two man-months of long and short term training in the U.S. and third countries is planned, costing approximately $70,000. Lastly, AID will finance certain installation and other start-up costs of project initiation costing approximately $70,000.

The Ministry of Fisheries will be responsible for the over-all direction and coordination of the project. In this capacity it shall secure an appropriate site in Chimbote for the feed pelleting plant and enter into sub-agreements with each of the three cooperating farmer communities specifying the responsibilities of each party and the implementation plan for each sub-project. The Ministry will be responsible for the supervision of all civil works construction activities. The Ministry will provide such technical assistance as necessary for training the personnel of the cooperating communities in fish farm management and operations and will augment its program for promoting the local consumption of trout. The Ministry will also contribute the estimated amounts of $22,000 and $18,000 respectively toward the installation and initial operating costs of the feed pelleting plant and the expanded hatchery at Huaraz. The contribution of the Huaraz hatchery shall be in addition to the present budget level of the hatchery. It is anticipated that both installations will be self-financing after project year two.

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Fresh Water Fisheries Development
527-0144

CHECKLIST OF STATUTORY CRITERIA

(Alliance for Progress)

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

The following abbreviations are used:

FAA - Foreign Assistance Act of 1961, as amended.

FAA, 1973 - Foreign Assistance Act of 1973.

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

MMA - Merchant Marine Act of 1936, as amended.

BASIC AUTHORITY

Answer or Discussion

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

a. for agriculture, rural development or nutrition; — For agriculture and rural development

b. for population planning or health;

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

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

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

COUNTRY PERFORMANCE

Progress Towards Country Goals

2. *FAA § 208; § 251(b).*

A. Describe extent to which country is:

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

The GOP has an active policy to increase food production, including extensive credit programs. A top priority activity is the Agrarian Reform program which among other things is consolidating and redistributing land holdings in an attempt to bring additional lands under cultivation. A Ministry of Food was established in 1975, with responsibility for technical assistance in production and marketing of food crops.

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

In the context of its industrial reform program (Industrial Law) and its balance of payment management, the GOP is seeking foreign and domestic private investments in areas identified as being essential to growth. Also see Item No. 2.5.

(3) Increasing the public's role in the developmental process.	Programs in Industry (Industrial Law), fishing (Fishing Law), mining (Mining Law) Agrarian Reform, and Social Property are especially designed to achieve this objective, as are efforts to mobilize the rural population.
(4) (a) Allocating available budgetary resources to development.	Sizeable portions of the GOP biennial (75/76) budget are being allocated to the top priority programs of educational, agricultural and industrial reform.
(b) Diverting such resources for unnecessary military expenditure (See also Item No. 20) and intervention in affairs of other free and independent nations.) (See also Item No. 11)	"See item N° 19."
(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.	In recent years, tax collections have improved and land reform has received top Government priority. Most of the press in Peru is Government managed. The current regime has slowed the tendency toward expansion of state enterprises. For example, currently the Government is selling the country's large fishing fleet back to private enterprise.
(6) Adhering to the principles of the Act of Bogota and Charter of Punta del Este.	Sound monetary and fiscal policies, coupled with significant economic and social reforms designed to restructure the Peruvian society along more equitable lines, indicate Peru's compliance with Alliance for Progress goals.

(7) Attempting to repatriate capital invested in other countries by its own citizens.	Recent decrees requiring full repatriation of foreign capital of Peruvians have had an important impact on the balance of payments and make available resources for investment in Peru.
(8) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.	The GOP appears to be responding to the economic, political and social concerns of its people, particularly the poor, and has intensified self-help efforts as indicated above.
B. Are above factors taken into account in the furnishing of the subject assistance?	Yes.

Treatment of U.S. Citizens by Recipient Country

3. *FAA § 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?*	No known instance.
4. *FAA § 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?*	The Government of Peru 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 which have been settled to the satisfaction of the GOP and the USG, including the Marcona Mining Company claim which was resolved in September 1976. The only outstanding expropriation claim is that of the U.S. Gulf Oil Corporation. Negotiations are continuing between the GOP and the company and a resolution of this claim is expected shortly.

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

a. has any deduction required by Fisherman's Protective Act been made?	No deduction has been required.
b. has complete denial of assistance been considered by A.I.D. Administrator?	The Administrator has taken into consideration prior seizure of U.S. fishing vessels by the GOP in his determination to continue to furnish assistance to Peru. There have been no such seizures or sanctions since the 1972-73 fishing season.

Relations with U.S. Government and Other Nations

6. FAA § 620(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?	No longer applicable.

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7. FAA § 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement?	Yes
8. FAA § 620(d). If assistance is for any productive enterprise which will compete in the United States with United States enterprise, is there an agreement by the recipient country to prevent export to the United States of more than 20% of the enterprise's annual production during the life of the loan?	Preference will be given to marketing project trout production for consumption within Peru. Some trout is currently exported. However, trout are not presently exported to the U.S., nor will trout production under the project be exported to the U.S.
9. FAA § 620(f). Is recipient country a Communist country?	No.
10. FAA § 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?	No.
11. FAA § 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property?	No.

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14.	FAA § 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, in convertibility or confiscation, has the A.I.D. administration within the past year considered denying assistance to such government for this reason?	The Administrator has taken Peru's limited guaranty program into consideration in determining to continue to furnish assistance to Peru.
15.	FAA § 620(n). Does recipient country furnish goods to North Viet-Nam or permit ships or aircraft under its flag to carry cargoes to or from North Viet-Nam?	No longer applicable.
16.	FAA § 620(q). Is the government of the recipient country in default on interest or principal of any A.I.D. loan to the country?	No.
17.	FAA § 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?	No.
18.	FAA § 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the A.I.D. Administrator in determining the current A.I.D. Operational Year Budget?	In March 1976 State/IO advised the following with respect to Peru's UN obligations: "The amount currently owed by Peru to the UN is not sufficient to trigger the 620(u) provisions." According to State/IO this statement would apply over the next year even if Peru makes no payments to the UN this year.

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17. FAA § 481. Has the government of recipient country failed to take adequate steps to prevent narcotic drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully?	No. The 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.
18. FAA, 1973 § 29. If (a) military base is located in recipient country, and was constructed or is being maintained or operated with funds furnished by U.S., and (b) U.S. personnel carry out military operations from such base, has the President determined that the government of recipient country has authorized regular access to U.S. correspondents to such base?	Not applicable.

Military Expenditures

19. FAA § 620(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).)	Approximately 15% of the GOP biennial (75/76) budget was allocated to military expenditures.

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CONDITIONS OF THE LOAN

General Soundness

20.	FAA § 201(d). Information and conclusion on reasonableness and legality (under laws of country and the United States) of lending and relending terms of the loan.	Not applicable.
21.	FAA § 251(b)(2); § 251(e). Information and conclusion on activity's economic and technical soundness. If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds $1,000,000, has country submitted to A.I.D. an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?	For the reasons given in the Project Paper the project is considered economically and technically sound.
22.	FAA § 251(b). Information and conclusion on capacity of the country to repay the loan, including reasonableness of repayment prospects.	Not applicable.
23.	FAA § 251(b). Information and conclusion on availability of financing from other free-world sources, including private sources within the United States.	The participation of other donors was considered when calculating the amount of AID's contribution to the project.

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24.	FAA § 611(a)(1). Prior to signing of loan will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the United States of the assistance?	Yes.
25.	FAA § 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of loan?	No such legislative action expected to be necessary.
26.	FAA § 611(e). If loan is for Capital Assistance, and all U.S. assistance to project now exceeds $1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?	Not applicable.

Loan's Relationship to Achievement of Country and Regional Goals

27.	FAA § 207; § 281(a); § 113. Extent to which assistance reflects appropriate emphasis on: (a) encouraging development of democratic, economic, political, and social institutions; (b) self-help in meeting the country's food needs; (c) improving availability of trained manpower in the country; (d) programs designed to meet the country's health needs;	Project activities are uniquely designed to meet the objectives of (b) and to a lesser degree (a) and (c). Improved health (d) should result from increased food production.

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(e) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (f) integrating women into the recipient country's national economy.

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

Not susceptible.

29. FAA § 251(b)(3). Information and conclusion on activity's relationship to, and consistency with, other development activities, and its contribution to realizable long-range objectives.

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

30. FAA § 251(b)(7). Information and conclusion on whether or not the activity to be financed will contribute to the achievement of self-sustaining growth.

The project is specifically designed to establish a viable model for increasing inland fisheries production in Peru, i.e., a model to encourage replication throughout Peru, thereby contributing to self-sustaining growth.

31. FAA § 209; § 251(b)(8). Information and conclusion whether assistance will encourage regional development programs, and contribute to the economic and political integration of Latin America.

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

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32.	FAA § 251(g); § 111. Information and conclusion on use of loan to assist in promoting the cooperative movement in Latin America.	The small farmers participating in the project will be composed of peasant groups and other types of "associative enterprises" which are promoted under Peru's comprehensive Agrarian Reform program, thereby contributing to the cooperative movement.
33.	FAA § 251(h). Information and conclusion on whether the activity is consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress in its annual review of national development activities.	The IBRD Consultive Group Meeting on Peru emphasized the justifiable need of international financial and technical assistance to Peru's development program.
34.	FAA § 281(a). Describe extent to which the loan will contribute to the objective of assuring maximum participation in the task of economic development on the part of the people of the country, through the encouragement of democratic, private, and local governmental institutions.	The project's implementation is designed to include small farmer-cooperative-type organizations and thus encourage maximum participation at the local level in economic development.
35.	FAA § 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.	The project contemplates significant involvement at the small farmer level and therefore strengthens democratic processes at the grass-roots level.

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36.	FAA § 601(a). Information and conclusions whether loan will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; and (f) strengthen free labor unions.	As previously indicated in items Nos. 32, 34 and 35, the use of cooperative-type organizations will be fostered under the project. The project will also improve and strengthen Peruvian technical expertise and efficiency in freshwater fish (especially trout) research and production.
37.	FAA § 619. If assistance is for newly independent country; is it furnished through multilateral organizations or plans to the maximum extent appropriate?	Not applicable.

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

38.	FAA § 251(b)(4); § 102. Information and conclusion on possible effects of loan on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving the U.S. balance of payments position.	The total amount of local costs under the project is so small as to have negligible effect on the U.S. economy and insignificant adverse effect on U.S. balance of payments.
39.	FAA § 252(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources.	There will be considerable procurement of supplies and equipment from local Peruvian private sources.

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40.	FAA § 601(b). Information and conclusion on how the loan will encourage U.S. private trade and investment abroad and how it will encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).	"See item No. 38"
41.	FAA § 601(d). If a capital project, are engineering and professional services of U.S. firms and their affiliates used to the maximum extent consistent with the national interest?	Essentially this is not a capital project; there will only be limited local construction, which in reality amounts to minor renovation work and installation of equipment.
42.	FAA § 602. Information and conclusion whether U.S. small business will participate equitably in the furnishing of goods and services financed by the loan.	Information for or about small businesses will be made available in accordance with A.I.D. policies.
43.	FAA § 620(h). Will the loan promote or assist the foreign aid projects or activities of the Communist-Bloc countries?	No.
44.	FAA § 621. If Technical Assistance is financed by the loan, information and conclusion whether such assistance will be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis. If the facilities of other Federal agencies will be utilized, information and conclusion on	No utilization of other USG agencies is anticipated.

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

Loan's Compliance with Specific Requirements

45.	FAA § 110(a); § 308(e). Has the recipient country provided assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the loan is to be made?	Yes.
46.	FAA § 112. Will loan be used to finance police training or related program in recipient country?	No.
47.	FAA § 114. Will loan be used to pay for performance of abortions or to motivate or coerce persons to practice abortions?	No.
48.	FAA § 201(d). Is interest rate of loan at least 2% per annum during grace period and at least 3% per annum thereafter?	Not applicable.
49.	FAA § 604(a). Will all commodity procurement financed under the loan be from the United States except as otherwise determined by the President?	Procurement will be in accordance with AID grant procurement regulations.
50.	FAA § 604(b). What provision is made to prevent financing commodity procurement in bulk at prices higher than adjusted U.S. market price?	Not applicable.

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51.	FAA § 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will loan agreement require that marine insurance be placed in the United States on commodities financed by the loan?	Not applicable.
52.	FAA § 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity?	Not applicable.
53.	FAA § 604(f). If loan finances a commodity import program, will arrangements be made for supplier certification to A.I.D. and A.I.D. approval of commodity as eligible and suitable?	Not applicable.
54.	FAA § 608(a). Information on measures to be taken to utilize U.S. Government excess personal property in lieu of the procurement of new items.	Consideration of excess availabilities will be given at time of procurement.
55.	FAA § 611(b); App. § 101. If loan finances water or water-related land resource construction project or program, is there a benefit-cost computation made, insofar as practicable, in accordance with the procedures set forth in the Memorandum of the President dated May 15, 1962?	Not applicable.

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56.	FAA § 611(c). If contracts for construction are to be financed, what provision will be made that they be let on a competitive basis to maximum extent practicable?	Not applicable.
57.	FAA § 612(b); § 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the United States are utilized to meet the cost of contractual and other services.	No excess U.S. owned foreign currencies are available in Peru. About 45% of direct project costs will be borne by the GOP.
58.	Agr. § 113. Will any of loan funds be used to acquire currency of recipient country from non-U.S. Treasury sources when excess currency of that country is on deposit in U.S. Treasury?	No. Peru is neither an excess nor a near-excess currency country.
59.	FAA § 612(d). Does the United States own excess foreign currency and, if so, what arrangements have been made for its release?	No U.S. owned excess foreign currencies available.
60.	FAA § 620(g). What provision is there against use of subject assistance to compensate owners for expropriated or nationalized property?	No such financing contemplated.

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61.	FAA § 620(k). If construction of productive enterprise, will aggregate value of assistance to be furnished by the United States exceed $100 million?	No.
62.	FAA § 636(i). Will any loan funds be used to finance purchase, long-term lease, or exchange of motor vehicle manufactured outside the United States, or any guaranty of such a transaction?	No.
63	App. § 103. Will any loan funds be used to pay pensions, etc., for military personnel?	No.
64.	App. § 105. If loan is for capital project, is there provision for A.I.D. approval of all contractors and contract terms?	Any contracts financed by project funds will be subject to AID approval.
65.	App. § 107. Will any loan funds be used to pay UN assessments?	No.
66.	App. § 109. Compliance with regulations on employment of U.S. and local personnel. (A.I.D. Regulation 7).	Nc.TCNs are anticipated to be employed under the project for construction or other purposes.

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67. App. § 110. Will any of loan funds be used to carry out provisions of FAA §§ 209(d) and 251(h)?

No

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

This project was included in the FY 1977 Congressional Presentation.

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

No.

70. MMA § 901.b; FAA § 640C.

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

Transport of project commodities will be in compliance with statutory requirements.

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

ANNEX I

INITIAL ENVIRONMENTAL EXAMINATION

Project Location: PERU

Project Title: Fresh Water Fisheries Development - 527-0144

Funding: (First FY) FY 1977: $465,000

Life of Project FY 1977 - FY 1980

IEE Prepared by: Date: December 15, 1976

Mr. Louis Macary, USAID/Peru/PRM
Mr. Dallas Fowler, USAID/Peru/Environmental Coordinator
Mr. Jorge Cossio, USAID/Peru/AGR
(In coordination with investigation by USAID Consultant, Dr. Harold Hagen, Colorado State University and Ing. Hugo Gallegos, Peruvian Ministry of Fisheries, Inland Fisheries Division)

Environmental Action Recommended:

The USAID/Peru project committee for the Fresh Water Fisheries Development Project has undertaken a complete Initial Environmental Examination of the environmental impact aspects of the project and has arrived at a recommendation for a Negative Determination, as indicated on page 4, Threshold Decision section, of the IEE.

Concurrence:

I have reviewed the Initial Environmental Examination prepared by the project committee and concur in the recommendation for a Negative Determination.

Donald Finberg
Director USAID/Peru

I. Examination of Nature, Scope, and Magnitude of Environmental Impacts

A. Description of Project

The project is aimed at improving the income and nutritional status of the economically marginal, rural population of the Peruvian sierra region through the development of trout production in highland lakes and fish farms. Toward this end an integrated program will be developed, consisting of:

1. The establishment of a trout feed pelleting plant with a capacity of 1 MT/per day.

2. The improvement of an existing GOP trout hatchery.

3. The completion/expansion of two community fish farms (rearing stations).

4. The stocking and harvesting of trout from two rural lakes.

The project will be implemented through the Peruvian Ministry of Fisheries, Inland Fisheries Division, with U.S. technical assistance in the form of various specialized fisheries consultants provided with AID financing. Initial project design was largely developed by Dr. Harold K. Hagen, Fisheries expert, Colorado State University, under contract with AID and in close coordination with Ministry of Fisheries technical personnel.

The hatchery, fish farms and lakes to be included in the project are all located in the sierra (highlands) of the Department of Ancash. Ancash is located between 8 and 10 degrees south latitude and 77 and 79 degrees west longitude. Although located on Peru's central coast, much of Ancash is characterized as sierra, and some of Peru's highest mountains are located within the department. The department abounds with lakes and streams which have as their source run-off from mountain glaciers. The project lakes, Purhuay and Querococha, are typical of such highland lakes and suitable for trout as evidenced from the presence of spawning population in both lakes.

The only major project activity that will be undertaken outside of the Ancash highlands is the establishment at Chimbote of the experimental fish feed pelleting plant. The city of Chimbote on the Ancash coast is one of Peru's largest commercial fish and fishmeal processing centers.

b. Identification and Evaluation of Environmental Impacts

The only elements within the project where impacts on the environment might become measurable are in the areas of water quality and cultural/nutritional patterns. (See Impact Identification and Evaluation Form, attached to this Annex.) With respect to both of these elements (as with all project elements) it must be emphasized that any environmental impact under the project will be limited essentially to small geographic areas.

Cultural and nutritional impacts on the project area populations should be little-to-moderate, and favorable. Trout are not new to Peru and are found widely scattered, although in limited numbers, throughout the sierra region. Although other native fish exist in the two project lakes, (as with most highland lakes) their quantity is low having often been depleted by over-fishing. Once stocked with project trout and regulated with respect to "harvesting", an additional local source of protein will be more readily available.

With respect to water quality, precautions seem more necessary to control and protect water supplies flowing into the project (into the existing hatchery and rearing stations). In the instance of the Huaraz hatchery, for example, the inlet canal will be covered and screens will be installed as water intake pollution control measures. The physical state of water will not be affected at the two project control lakes and no new water supply will be required for the hatcheries.

The types and chances of pollution that could occur under the project are minimal. Fish populations in the two project lakes will be kept at biologically acceptable levels through careful monitoring by project personnel from the Ministry of Fisheries. Viscera from harvested fish, which could be a source of minor pollution, are important for both animal and human consumption, and it is not likely they will be wasted in the lakes. Discharge from the project hatcheries, as at present will go directly into field crops through irrigation or into a river where dilution will be more than sufficient to erase any undesirable wastes. While the possibilities of pollution from the hatchery discharges during the project life will be negligible, future expansion of any of the hatcheries could produce an organic overload of suspended solids (fecal waste). However, at each of the project hatchery sites a settling basin (pond) location will be set aside so that if fecal control is needed at some future date a pollution control plan can be rapidly implemented.

The small feed pelleting plant to be developed at Chimbote should pose no environmental concern or problems. The city's main

industry (and one of Peru's largest) is fish and fishmeal processing and the plant will use this abundant locally available resource for processing the fish feed pallets. The plant will be located in an already existing building and only minor construction and installation of equipment will be required. The layout of the plant will incorporate normal worker safety precautions. Disposable waste from the plant will be so minimal as to pose no threat to the environment. Also, any odors emitted from the processing would be dwarfed by the existing heavy smell of the fish and fishmeal from the large processing plants of Chimbote.

II. Recommendation for Environmental Action

The nature and scope of the Fresh Water Fisheries Development project has been thoroughly considered with respect to the criteria contained in the Impact Identification and Evaluation Form with the conclusion that the project will have limited effects on the environment and no significant adverse impacts. Also largely contributing to this conclusion are certain particular characteristics of the project, as follows:

1. It is essentially a small pilot project, consisting largely of controlled research and experimentation.

2. The project will be confined to specific geographic locations comprising very small areas, in one of Peru's 23 Departments.

3. The project will be subject to careful and continuous monitoring by capable technicians.

Threshold Decision: For the reasons cited above, the Mission believes that no further environmental study is necessary and therefore recommends a Negative Determination.

Attachment to Annex I
Initial Environmental
Examination (IEE)

IMPACT IDENTIFICATION AND EVALUATION FORM [1/]

USAID/Peru
Fresh Water Fisheries Development Project
527-0144

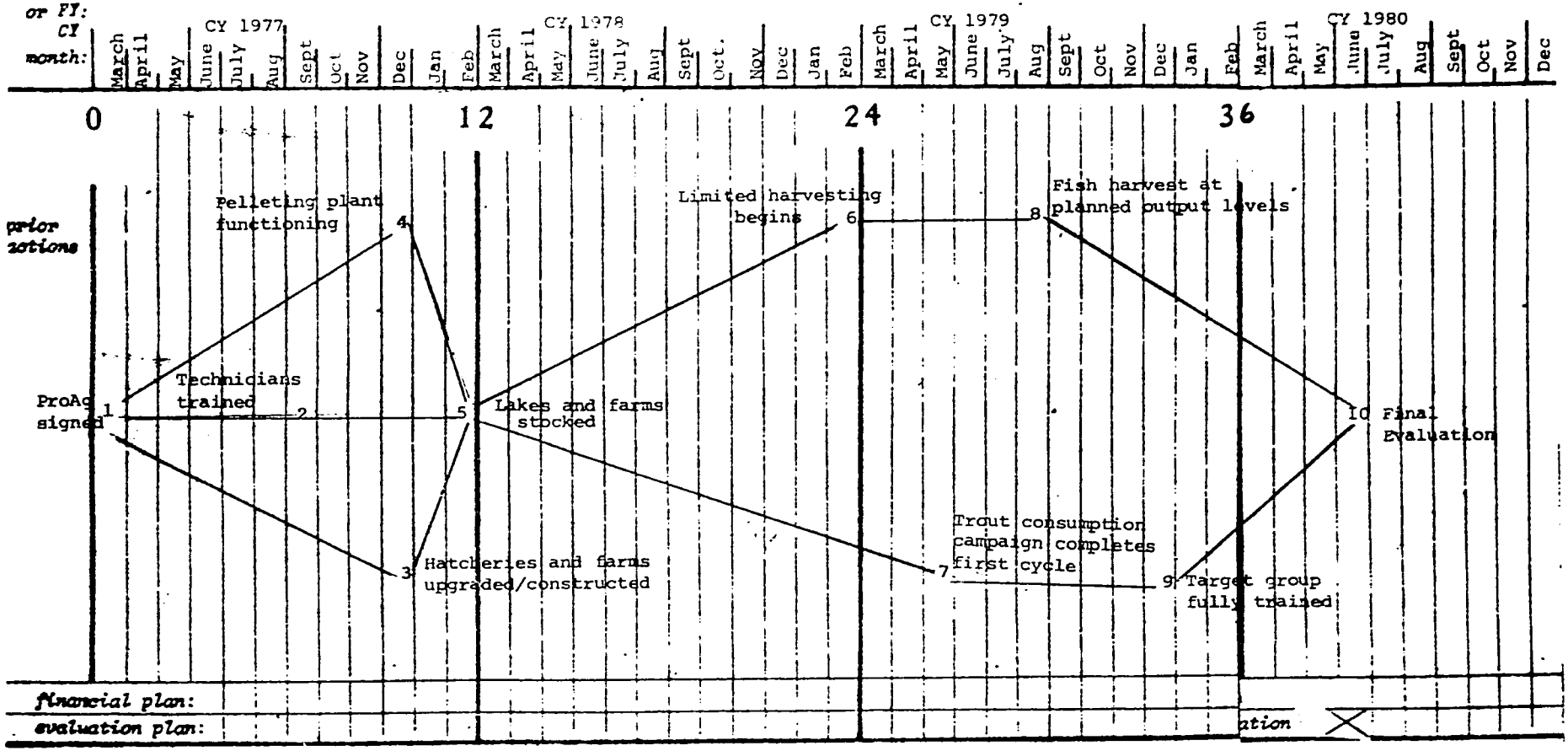
A. LAND USE	
1. Changing the character of the land through:	
a. Increasing the population	N
b. Extracting natural resources	N
c. Land clearing	N
d. Changing soil productivity capacity	N
2. Altering natural defenses	N
3. Foreclosing important uses	N
4. Jeopardizing man or his works	N
B. WATER QUALITY	
1. Physical state of water	N
2. Chemical and biological states	L
3. Ecological balance	M
4. Other factors	NONE
C. ATMOSPHERIC	
1. Air additives	N
2. Air pollution (feed pelleting plant only)	L

1/ Use the following symbols: N - No environmental impact
L - Little environmental impact
M - Moderate environmental impact
H - High environmental impact
U - Unknown environmental impact

3. Noise pollution	N
4. Other factors	NONE
D. NATURAL RESOURCES	
1. Diversion, altered use of water	L
2. Irreversible, inefficient commitments	N
3. Other factors	NONE
E. CULTURAL AND SOCIOECONOMIC	
1. Altering physical symbols	N
2. Changes of cultural traditions	L
3. Changes in population	N
4. Other factors:	NONE
F. HEALTH	
1. Changing a natural environment	L
2. Eliminating an ecosystem	N
3. Other factors: Food supply	M
G. GENERAL	
1. International impacts	N
2. Controversial impacts	N
3. Larger program impacts	N
4. Other factors:	NONE

ANNEX I

country:	project no:	project title:	date.	/ X / original / / revision#	PPT xpor		
PERU	527-0144	Research and Development in Fresh Water Fisheries					



PROJECT PERFORMANCE NETWORK

PR

COUNTRY	PROJECT NO	PROJECT TITLE	DATE	ANNEX I
PERU	527-0144	Research and Development in Fresh Water Fisheries		[X] ORIGINAL [ ] REVISION # — APPROVED

PROJECT PURPOSE (FROM PRP FACESHEET)

To establish a viable model for increasing trout production in Peru by: (a) demonstrating that intensive hatchery production and sale of trout is an economically feasible enterprise constituting an additional source of income for subsistence farmers; and (b) demonstrating that extensive production of lake trout for direct farm consumption can significantly improve the protein diet of the small farmers.

CPI DESCRIPTION

ACTION AGENT		DATE
AID/GOP	1. Signed Project Agreement	3/77
CONTRACTOR	2. Technicians trained by U.S. Contractor	9/77
GOP/CONTRACTOR	3. Hatcheries and farms upgraded/constructed	12/77
GOP/AID/CONTRACTOR	4. Pelleting plant functioning	12/77
GOP	5. Lakes and farms stocked	2/78
TARGET GROUP	6. Limited harvesting begins	2/79
GOP/TARGET GROUP	7. Trout consumption campaign completes first cycle	5/79
TARGET GROUP	8. Fish harvest at planned output levels	8/79
GOP/TARGET GROUP	9. Target group fully trained	12/79
AID/GOP	10. Final Evaluation	