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 \*5270 188 PERU  
 \* WATER NGHT IN SMALL COMMUNITIES PVO-OPG \*  
 \* FY79 TO FY81 \*  
 \*\*\*\*\*

\*\*\*PROJECT SUMMARY DESCRIPTION\*\*\*

Operational program grant is provided to the Association of Rural Development in Cajamarca (ASPADERUC) to develop small community ecosystems in the sierra of Peru's Cajamarca province. ASPADERUC will implement the project with technical assistance from the University of Cajamarca (UOC). Development committees will be organized in each of the three small rural communities selected as project sites--Yanabango, Paríamarca, and La Paccha-Agocucho--and will collaborate with ASPADERUC in the design and construction of each community's development model (ecosystem). In each community, use of soil and water resources will be improved through forestation, irrigation, and rehabilitation of pasture and farmlands. Income-generation efforts and the provision of such basic public services as health posts, potable water and sewerage systems, and roads will, in combination with the resource management activities, initiate an 18-year system of integrated rural development. Construction of 70 kms of roads under the supervision of UOC engineers will link the communities with the provincial capital and will precede provision of public services in each area. Community workshops, stores, and centers will be built to encourage employment generation; all construction activities will be labor-intensive to the highest possible degree. Natural resource management activities will include the planting of 200 ha of pine forest and 20 ha of vegetable/fruit garden (centered around community schools) and the terracing and irrigation of 10 ha of land for agricultural use. Reforested land will help prevent further erosion and loss of fertility, improve water retention, rehabilitate pasture acreage for sheep foraging and will, by the ninth year, be suitable for harvesting as new sources of wood and wood pulp. Project activities will directly benefit the 1,050 families of the targeted areas.

\*\*\*DESCRIPTIONS\*\*\*

INTEG RUR DEVEL	RURAL ISOLATION	RUR WATER SUP	ROAD CONSTRUCT
PVO HOST CNTRY	RESOURCE NGHT	FORESTATION	HLTH POST CNST
IRRIGATION	IRRIG CANALS	EMPLOYMENT	AGC PRODUCTION
FORAGE	SEWAGE COLLECT	POTABLE WATER	VEGETABLE
FOREST PLANT	FRUIT	COMMUNITY DEVEL	CHNTY GARDEN
CHNTY PARTIC			

SUB-PROJECT NUMBER: 00

BATCH NUMBER: 54

UNITED STATES GOVERNMENT

# Memo randum

TO : Mr. Leonard Yaeger  
Director

DATE: September 11, 1979

FROM : Larry Smucker   
Program Officer

SUBJECT: Asociación para el Desarrollo Rural de Cajamarca, ASPADERUC OPG --  
Water Management in Small Communities, Cajamarca

## Introduction

Attached for your review and approval is a proposal submitted by the Association for the Rural Development of Cajamarca, ASPADERUC, requesting Operational Program Grant (OPG) assistance to carry out a two-year program aimed at restoring the ecological equilibrium between natural resources and human needs in the sierra of Cajamarca. ASPADERUC proposes to develop three integrated rural development eco-systems comprising 2,000 hectares of land. In each system, a balance will be established between the preservation, regeneration and economic utilization of natural resources, and the provision of basic human needs of an estimated 1,050 families that will be settled in the three sites.

The center of each eco-system will be a small community where such primary resources as soil, sub-soil and water will be improved for economic utilization through the establishment of forests, grazing areas, agricultural terraces for intensive production, and water collection and redistribution systems combined with income generation efforts. In addition, project activities will include the provision of basic services and the planned, rational and progressive settlement of human beings. The complete development scheme has an 18-year cycle.

The total cost of the first three years to develop three eco-systems is estimated at \$434,000 of which ASPADERUC proposes that US.\$200,000 be provided by USAID under an Operational Program Grant. OPG assistance will be utilized to defray the costs of infrastructure -- roads, reservoirs, irrigation, potable water and sewage systems, community locales -- as well as forestation and agricultural activities.

## Background

The USAID strategy, as stated in the recent CDSS, includes three basic thrusts: a) sierra social programs; b) sierra and high jungle economic growth; c) urban basic human needs. The strategy of sierra and high jungle development calls for the provision of infrastructure, rural public works, small scale irrigation, and programs to improve agricultural research and extension activities, as well as to stimulate rural enterprises, facilitate use of appropriate technologies and improved delivery of agricultural inputs and services, improve natural resource preservation and renewal, and develop small-scale hydro-electric power.

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Because of the vast size of the sierra, the limited resources available, and administrative considerations, USAID has limited its focus on selected regions. Cajamarca has been selected as a priority area on the basis of growth potential, prevalence of poverty, local institutional capacity, GOP designation as priority area and potential for replicability.

The population in Cajamarca is characterized by low income, out-migration of the more productive segment of the population, a dependence on subsistence agriculture and low-technology, and lack of basic services. The geographical and climatic conditions are characteristic of under-developed areas. Cajamarca is comprised of a few fertile valleys where the population is clustered and exceeds resources available to assure subsistence; a high jungle area where lack of communications and technology hinder the exploitation of abundant natural resources, and a large sierra region of which 80% is hillside. What were once slopes covered with vegetation are now virtually denuded as a result of erosion and irrational use of natural resources. Water represents an additional and serious development constraint. Since only scarce vegetation exists to absorb rainfall during the rainy season, rain flows down the slopes, often creating landslides, and is consequently wasted. Little or not water can be obtained from the sub-soil during the dry periods.

The lack of water is an important factor in reducing agricultural production yields by 25% to 100% depending on the size of the farm plot.

The Department of Cajamarca has a history of self-help rural development projects. The Belgian Government has recently ended a five-year departmental program (CICAFOR) in which US.\$65 million was provided for technical and material assistance for integrated rural development. Project activities included a large-scale reforestation effort and the establishment of nurseries, soil analysis, photographic mapping, establishment of radio communications networks, school construction, and rural infrastructure, including roads, terracing and potable water, in four provinces. The USAID and the GOP signed in 1979 a loan/grant totalling more than \$16 million to strengthen a decentralized regional planning capability in the Departments of Junin and Cajamarca. Among the activities to be financed are a series of rural public works in the following areas: (1) productive infrastructure, including irrigation and terracing, (2) economic infrastructure, such as feeder roads, and (3) social infrastructure, including schools health posts. The USAID loan/grant, however, provides but limited funding for rural public works in Cajamarca, and the needs are much greater than the resources this program can make available.

### The Project

In 1977 the Technical University of Cajamarca was delegated from the Peruvian Planning Institute, INP, responsibility for the development

of 4,000 hectares of rural sites in the Province of Cajamarca, most of which consisted of eroded, bare slopes of medium altitudes. For the past 12 years, the University and a group of prominent professionals of Cajamarca have been working on alternative responses to the situation, seeking to create resources and services needed by the campesino population.

Based on the belief that ecological equilibrium must be restored before meaningful economic development can occur, an integrated community development model has been created which, respecting the cultural values of the indigenous population, is expected to provide the natural, technical and scientific resources needed to satisfy its economic needs.

The model, which has been denominated "eco-system", relies heavily on infrastructure development and use of community labor, and evolves around a small community. The first activity in developing the eco-system is the construction or improvement of roads linking the site with the city of Cajamarca. The next important step is forestation of the site's mountainous areas utilizing primarily pine trees. These are preferred over the more traditional eucalyptus because of their qualities as rainfall collectors, preventing erosion, and because the soil under pine trees becomes pasture land suited for cattle raising. Rows of trees on the slopes are alternated with canals and terraces constructed with the project funds. The canals serve as collection points for rainfall which the pines collect at their base, and are linked to small reservoirs in which the collected water is deposited and redistributed for irrigation and human consumption. The terraced areas are utilized much as the Incas used them, for growing high protein native tubers and grains such as quinoa, tarhui, oca and different types of potatoes.

Over time, the scheme envisions this combination of pine trees, canals and terraces as the source of wood and wood pulp, improved and increased pastures, additional cultivable land and availability of water. An additional and important advantage is the control of soil erosion.

The system includes the establishment of one or more income-generating projects (e.g. artisan shop, community store, restaurant); the construction of a school, and the provision of such basic services as water, sewerage, and medical posts, all accompanied by the progressive settlement of campesinos at a rate permitted by the increased availability of resources. The population will be trained on the use and preservation of their natural resources.

The 18-year development cycle of an eco-system consists of the following:

The first three years require investment on infrastructure and agricultural work. From the third to the sixth year, the work is

performed basically by nature; between the seventh and eleventh year ecological results begin to appear; from the twelfth year on the yields of the investment made begin to produce economic benefits, and by the eighteenth year the eco-system should be self-supporting.

The first of the eight eco-systems targeted for the area is already functioning on an experimental basis at one site, AYLAMBO, where barren slopes have been transformed into a 16 hectare park over a 12 year period. ASPADERUC, together with the University of Cajamarca, is requesting OPG assistance to replicate the model and create similar eco-systems in three additional locations comprising 2,000 of the 4,000 hectares assigned to the University of Cajamarca for development.

ASPADERUC proposes to work in three strategically located small, rural communities: Yanamango (population 390 families), La Paccha-Agocucho (population 380 families) Pariamarca (population 290 families).

The campesinos that live in these communities are being organized in "development committees" that will collaborate with ASPADERUC and the University in all project activities. Prior to the initiation of activities, the committees will enter into agreements with ASPADERUC approving the work to be carried out in their communities and providing for their contribution in labor. The population will provide an estimated 171,600 person/days of labor. These committees will also be responsible for following up project activities and maintaining infrastructure and resources once ASPADERUC has completed its activities.

Directly related to the contribution of the communities is the contribution of ONAA which has agreed to provide food for work rations equivalent to 2,000 MT for the period of the project.

Following the signing of the Grant Agreement, ASPADERUC will initiate construction of the following infrastructure at each of the following sites:

	LA PACCHA--			
	<u>YANAMANGO</u>	<u>AGOCUCHO</u>	<u>PARIAMARCA</u>	<u>TOTAL</u>
Reservoirs	7	7	16	30
Roads built, in Kms	2	3	5	10
Roads improved, in Kms	4	6	5	15
Workshops, 70 mts. <sup>2</sup> each	1	1	1	3
Community stores, 50 mts. <sup>2</sup> each	1	1	-	2
Community health posts, 50 mts. <sup>2</sup> each	1	1	1	3
Community centers, 90 mts. <sup>2</sup> each	1	1	1	3
Retention walls, in meters	500	500	1000	2000
Agricultural terraces, in hectares	3	1	6	10
Forests planted, in hectares	60	40	100	200
Vegetable and fruit gardens, in hectares	5	5	10	20
Potable water systems, with reservoir	1	1	1	3
Sewerage systems	1	1	1	3
Pedestrian and bridal paths, in Kms.	5	5	10	20
Irrigation ditches, in Kms.	3	2	5	10

The initial three months will be dedicated to the preparation of tree nurseries for the three project sites, and the design of construction plans. During this period actual construction will begin in Pariamarca on the larger roads, the reservoirs, agricultural terraces, vegetable garden and the local for a knitting workshop.

During the second quarter forestation activities, construction of irrigation ditches and of bridal and pedestrian paths will begin in the three communities. In addition, a health post will be built in Pariamarca and in Yanamango a community tambo, another health post and a water and sewage system will be initiated. In Yanamango and La Paccha construction of access roads and agricultural terraces will also be initiated.

During the third and fourth quarter sewerage and potable water systems will be initiated in the other two sites -- Pariamarca and La Paccha. Road improvement and a community center will be started in Pariamarca. In both La Paccha and Yanamango construction of the reservoirs, workshops

and vegetable gardens will be built. In addition, a tambo will be built for La Paccha and a community center for Yanamango.

During the second year of the project construction work and forestation activities will continue in all sites simultaneously. During the first quarter, a health post and a community center will be started in La Paccha. During the third and fourth quarters all the community infrastructure -- workshops, tambos, health posts and community centers -- will be operating.

A tentative implementation plan for the period covered by the OPG, as well as a map indicating the location of the sites where the project will be carried out, are found in Annexes 1 and 2.

A major economic benefit of the project investment will be the exploitation of the 200 hectare forests created by the project. Following are the estimated financial yields per cutting cycle from the 9th year on:

Year 9	= \$ 3,221 per hectare x 200 hectares planted =	\$ 64,400
Year 13	= \$ 4,660 per hectare x 200 hectares planted =	\$ 73,200
Year 17	= \$ 6,160 per hectare x 200 hectares planted =	\$ 123,200
Year 20	= \$14,000 per hectare x 200 hectares planted =	<u>\$2,800,000</u>
Total Estimated Value of Timber Yields		\$3,060,800

In addition to the above, the irrigation network, retention walls and terraces will incorporate 10 hectares of land to agricultural production and will rehabilitate 50 hectares of pastures with a forage capacity of three sheep per hectare. At present the slopes produce no agricultural outputs and the forage ratio is 10 hectares per head of sheep. The vegetable and fruit gardens, centered around the community schools, will incorporate an additional 10 hectares of land to productivity.

Among the services provided, the community stores, tambos and workshops will be the key elements of each micro-region. They will not only provide employment for members of the community, but the tambos will provide a market facility for the regular agricultural produce that results from project inputs as well as provide manufactured goods at accessible prices. Profits resulting from both the workshops and the tambos -- once they have reached their estimated optimum growth -- may contribute to run, maintain, repair and eventually replace the AID donated vehicles and machinery.

The Title II food distribution program will provide a nutritional supplement for the population, while the newly available medical and

sanitary services will improve health conditions. These services will include promotion, education and training programs directed at the project beneficiaries.

### Machinery and Vehicles

OPG inputs will be heavily concentrated on construction of infrastructure. Thus, ASPADERUC is requesting OPG funds to buy a dump truck and a cement mixer during the first year of activities, and a vehicle for transport of personnel and a second dump truck during the project's second year.

Although the USAID OPG Committee feels this type of project should operate with a minimum investment of vehicles and heavy machinery, relying instead on their rental for limited periods and an intensive community labor contribution, the Committee has accepted the purchase of a vehicle and mixer in the first year budget on the grounds that: (1) a dump truck has multiple uses, e.g. remove debris and rock, transport of construction materials, tools and workers; (2) it will be utilized 365 days per year; (3) rental of a similar vehicle in Cajamarca is not possible; and, (4) this type of machine must be available on a timely basis or it can severely hinder construction work. The mixer is justified to insure the quality of concrete mix for such infrastructure as the reservoirs. Other needs for heavy equipment during the first year of the OPG will be covered with rental of the machinery for limited periods.

ASPADERUC has agreed to establish a fund to eventually replace the machinery purchased with OPG funds with gradually increasing contributions from project beneficiaries and income generated by the workshops, tambos, or rental of the equipment (see Annex 3). In addition, during the first year of the OPG, ASPADERUC will keep cost records to determine the extent to which second-year activities can be carried out on a timely basis with rental of heavy equipment on as-needed basis. ASPADERUC will also explore the possibility of coordinating its needs with the machinery pool that will be provided to the Departmental Development Committee of Cajamarca, CODEC, under the USAID Integrated Regional Development Loan. Based on the information of machinery requirements and cost estimates, USAID and ASPADERUC will jointly review and evaluate equipment and machinery needs for the second year of OPG activities.

### Technical Aspects and Supervision

Overall project planning, design, execution and supervision will be the responsibility of ASPADERUC. Both ASPADERUC and OPG funds will be used to cover the necessary administrative and support personnel: one project manager, one assistant, one accountant, two secretaries and two drivers. The University of Cajamarca will provide three engineers: 1 field coordinator, 1 civil engineer in charge of design, execution and supervision of civil construction, and 1 agricultural engineer to supervise

overall agricultural production, pastures, water and construction of agricultural infrastructure. PRODESCA, the Departmental Development Committee, will provide the following personnel: 1 forestry engineer to supervise forestation activities; one social assistant in charge of promotion and education programs, and one communications technician who will work with the campesino communities and be responsible for the preparation of all written materials.

Attached are estimates for all the infrastructure costs of the project which have been prepared by ASPADERUC and USAID (see Annex 3). In addition to AID and ASPADERUC, the contributions of all other parties involved in the project -- PRODESCA, the University of Cajamarca, and the beneficiary communities -- will be included in agreements with ASPADERUC which will be made condition precedent to disbursement of AID grant funds.

#### Illustrative Project Budget

The following is an illustrative budget which indicates AID OPG funding requirements and contributions from ASPADERUC, the University of Cajamarca, PRODESCA and the campesino communities.

<u>Illustrative AID Contribution</u>	In U.S. Dollars		
	<u>Year 1</u>	<u>Year 2</u>	<u>Total</u>
1. <u>Construction Equipment</u>			
1 Dump truck, CIF Callao	40,000		40,000
1 Cement mixer	5,500		5,500
Equipment rental and repair	9,500		9,500
Equipment for transport of personnel		12,000	12,000
Heavy equipment for construction		51,000	51,000
2. <u>Tools: shovels, picks, wheelbarrows</u>	13,000	6,000	19,000
3. <u>Materials for Construction</u>	12,000	10,000	22,000
4. <u>Personnel</u>			
Masons and master workmen	3,000	3,000	6,000
Administrative personnel	6,000	6,000	12,000
Legal obligations (insurance, severance)	4,000	4,000	8,000
5. <u>Gasoline and Oil</u>	5,000	5,000	10,000
6. <u>Travel and Per Diem</u>		1,000	1,000
7. <u>Contingency</u>	<u>2,000</u>	<u>2,000</u>	<u>4,000</u>
TOTAL	100,000	100,000	200,000

Overall financial requirements for the two year OPG are as follows:

	<u>Administrative &amp; Technical Cost</u>	<u>Labor</u>	<u>Equipment &amp; Materials</u>	<u>Total</u>
AID	26,000	-	174,000	200,000
ASPADERUC	5,000	-	-	5,000
University of Cajamarca	25,200	-	17,740	42,940
PRODESCA	12,200	-	20,000	32,200
Communities Involved	<u>-</u>	<u>153,700</u>	<u>-</u>	<u>153,700</u>
TOTAL	63,400	153,700	211,740	433,840

ASPADERUC's contribution will consist of an administrative assistant, a secretary, one driver, and office equipment and supplies. The University will provide three full-time engineers and five construction workers as well as warehousing, seedlings and transportation services. PRODESCA will contribute one full-time engineer, one social assistant, one communications technician and two masons in addition to material and equipment. The beneficiaries of the projects will provide an estimated 250 jornales per day. At the official rate of S/.250 per person/day, working an average of 5 1/2 days per week, the contribution of the communities over a two-year period would be: 250 jornales x S/.250 per day per 572 days = S/.35,750,000 equivalent to \$153,700 at the present rate of \$1 = S/.230.

The contribution of the Oficina Nacional de Apoyo Alimentario, ONAA, will be equivalent to 23 MT per month for the remainder of 1979; 25 MT during the first six months of 1980, and 100 MT per month until 1981. This would be equivalent to a total of 2,000 MT over the life of the project.

#### Project Beneficiaries

Beneficiaries of the project will be 1,050 families of Cajamarca. These families typically have annual per capita incomes of approximately \$175. The average family land-holding in Cajamarca is 2.0 hectares much of which is unsuitable for food production. These families are predominantly members of comunidades campesinas which are characterized by seasonal migration in which the male heads of households and eldest sons travel to the coast to earn additional income harvesting rice and sugar, returning to their villages after the harvest. In addition, although the preference of the campesinos is to remain in their communities, an estimated 150,000 people have migrated from Cajamarca over the past 11 years at a rate of 13,000 per year. The project will attempt to provide this target population -- the rural campesino in the areas closest to the city of Cajamarca -- sufficient incentive to remain in the area by providing resources and services to satisfy its needs.

### The POV

Although ASPADERUC was legally established only during the past year, its members have been collaborating for the past 12 years. Its membership is representative of the most influential and dedicated citizens of Cajamarca -- including the Rector of the Universidad Técnica de Cajamarca and the Bishop -- whose purpose in creating ASPADERUC has been to collaborate for the development of their Department.

The Association has demonstrated considerable amount of initiative and managerial capacity in obtaining legal recognition of ASPADERUC in a very brief period. The technical capacity of the Association and its members has been demonstrated in the implementation of the Aylambo model where the activities similar to those that will be carried out with OPG funds are presently being implemented.

As a result of these considerations, the Mission believes that, despite their short life as a legal entity, ASPADERUC is qualified to administer this OPG.

### Project Evaluation

The Project's purpose of establishing three integrated community development systems is based on a model requiring a period of up to 18 years to develop. Nevertheless, the project's success will be determined, to a large extent, on the provision of AID-financed inputs required to produce a substantial variety of agricultural and physical infrastructural outputs. Consequently, annual project evaluations will concentrate, in the first year, on the timely provision of inputs and, thereafter, on the attainment of outputs. At the end of project activities, the evaluation will focus on assessing the probability of successful implementation of the model of restoring the equilibrium between natural resources and human needs. General terms of reference for all evaluations will be based on the Logical Framework, Annex 4, and the Project Evaluation Summary (PES) format will be used. USAID project monitoring responsibilities will reside in both the Engineering and Rural Development Offices.

### GOP Interest and Concurrence

(See letters attached from Ing. Renato Rossi Loureiro, Director Superior, Ministry of Agriculture and Food, and from Tnte. Crnl. Guillermo Valdivieso Calderán, President, Departmental Development Committee of Cajamarca.)

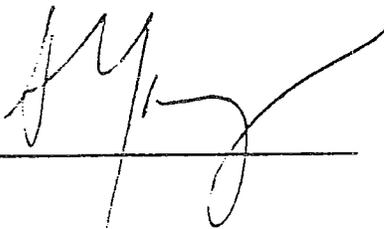
The GOP has accorded high priority to local integrated rural development activities and has actively sought external financing of the types of activities to be financed by this project. In addition, the project, undertaken by a private local organization committed to the

rural development of its own region, conforms with the GOP's efforts of decentralizing planning and implementation of local interest projects.

Issues and Recommendations

The USAID Project Committee is essentially in agreement that the project's concept is feasible and has already been tested successfully in an earlier effort. The major issue, which has been resolved after a series of discussions with ASPADERUC, concerns the project's funding requirements, especially with regard to construction equipment. The committee has decided not to accede to the initial requests to finance a variety of equipment, providing instead funds for rental. If, after the first year of project activities, it appears that additional purchase is justified on an economic basis, USAID will consider the purchase, rather than rental, of construction equipment.

The ASPADERUC proposal for OPG assistance substantially meets the criteria for OPG programs and merits AID support. Project beneficiaries fall well within Peru's poor majority. The GOP endorses the proposal, and we believe that ASPADERUC has the administrative capacity required to successfully implement the project. In view of the above, your approval of the ASPADERUC OPG request is recommended.

Approved:  \_\_\_\_\_

Date: 9/20/79

Disapproved: \_\_\_\_\_

Date: \_\_\_\_\_