

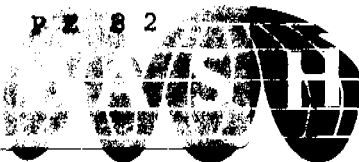
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# RECOMMENDATIONS FOR THE RURAL WATER AND ENVIRONMENTAL SANITATION PROJECT IN PERU

WASH FIELD REPORT NO. 38

APRIL 1982

WASH SANITATION  
PROJECT



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The WASH Project is managed  
by Camp Dresser & McKee  
Incorporated. Principal  
Cooperating Institutions and  
subcontractors are: Interna-  
tional Science and Technology  
Institute; Research Triangle  
Institute; University of North  
Carolina at Chapel Hill;  
Georgia Institute of Tech-  
nology—Engineering Experi-  
ment Station.

Prepared For:  
USAID Mission to Peru  
Order of Technical Direction No. 74

827 PE82  
3992

**WATER AND SANITATION  
FOR HEALTH PROJECT**



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ment Station.

April 8, 1982

Malcolm Butler  
Mission Director  
USAID  
Lima, Peru

Attn: Paul White

Dear Mr. Butler:

On behalf of the WASH Project I am pleased to  
provide you with fifteen copies of a report  
entitled Recommendations for the Rural Water  
and Environmental Sanitation Project in Peru.

This is the final report by David Donaldson  
and Charles S. Pineo, and is based on their  
trip to Peru from January 14 to February 2,  
1982.

This assistance is the result of a request by  
the Mission in December, 1981. The work was  
requested of the WASH Project on December 15,  
1981 by means of Order of Technical Direction  
No. 74, authorized by the USAID Office of Health  
in Washington.

If you have any questions or comments regarding  
the findings or recommendations contained in  
this report we will be happy to discuss them.

Sincerely,

Dennis B. Warner, Ph.D., P.E.  
WASH Project Director

DBW:jml

cc: Mr. Victor W.R. Wehman, Jr.  
S&T/HEA

*K.D. 3999*

WASH FIELD REPORT NO. 38

REPUBLIC OF PERU

RECOMMENDATIONS FOR THE RURAL WATER  
AND  
ENVIRONMENTAL SANITATION PROJECT IN PERU

Prepared for USAID Mission to Peru  
under Order of Technical Direction No. 74

Prepared by:

David Donaldson  
and  
Charles S. Pineo

April 1982

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Water and Sanitation for Health Project  
Contract No. AID/DSPE-C-0080, Project No. 931-1176  
Is sponsored by the Office of Health, Bureau for Science and Technology  
U.S. Agency for International Development  
Washington, DC 20523

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## ACKNOWLEDGEMENTS

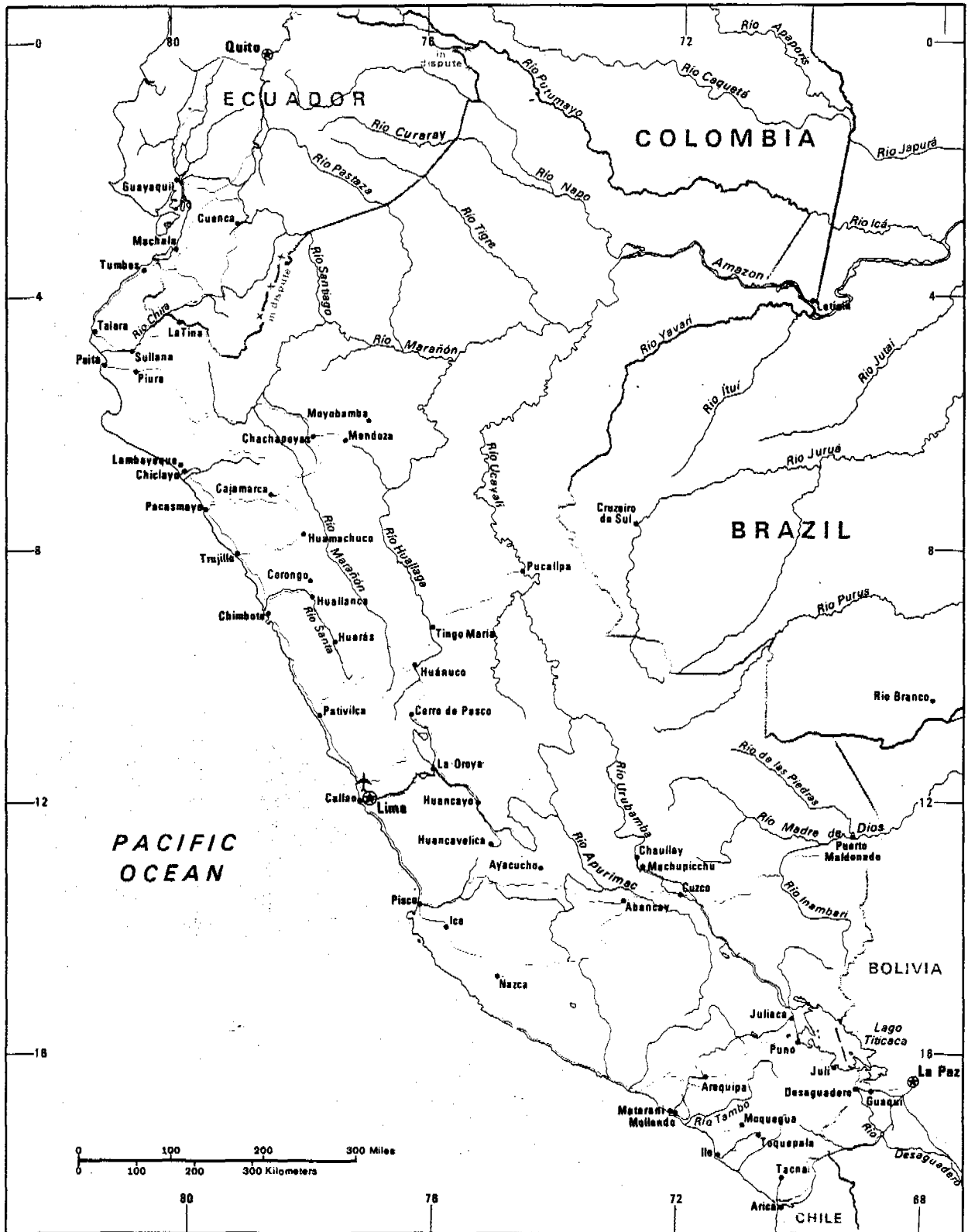
It would have been impossible to carry out the present assignment without the assistance that the team has received from the U.S. Agency for International Development (USAID) Mission, Dirección de Ingeniería Sanitaria (DIS), Ministry of Health of Peru (MOH), and the Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS) staff. We are particularly grateful to Paul White of USAID/Peru for the excellent briefing he gave us and for the contacts which he established for us with other members of USAID and with DIS. Janet Ballantyne provided invaluable assistance during Paul White's absence in the United States. Genny Martinez provided useful insights into the Primary Health Care Program and the relationship between DIS and MOH staff at the regional level. She made it possible to discuss the latrine program with Dr. Toledo of the MOH. We also appreciated the briefing and debriefing meetings which were held with the project team.

Thanks to the excellent rapport which exists between USAID and DIS, the team was able to have frank discussions with DIS personnel which have resulted in the recommendations in this report. A clear insight into the DIS implementation plans for the program was made possible by a number of meetings with Engineers Marroquin, Valdivia, Tejada, Escobar and Mr. Vargas. (See Appendix C for titles of the DIS personnel visited.)

A meeting at CEPIS with Engineer Saenz and other representatives of CEPIS, Paul White, and Engineers Marroquin and Bacigalupo provided background on CEPIS involvement in relation to the present program.

We appreciated the opportunity to renew old friendships and make new contacts in the course of carrying out our assignment for the USAID Mission in Peru.

# Peru



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 Standard parallels 3°00' and 15°20'  
 Scale 1:10,000,000  
 Boundary representation is not necessarily authoritative

## Chapter 1

### BACKGROUND

#### 1.1 The Project

In 1980 USAID/Peru developed a project entitled "Rural Water Systems and Environmental Sanitation" the goal of which is to help improve the health and well-being of the rural poor. It seeks to do this by assisting the Dirección de Ingeniería Sanitaria (DIS) of the Ministry of Health (MOH) to address one of the major constraints to improving the health status of the rural poor, i.e., the lack, on a consistent and long-term basis, of adequate potable water and waste disposal facilities.

In December 1981, USAID/Peru requested WASH assistance in the evaluation of the design of the initial 30 gravity fed water systems to be installed under the project and in the review of the proposed technical assistance (TA) package. The request resulted in the issuing of Order of Technical Direction No. 74 by the AID Office of Health (Appendix A).

#### 1.2 Project Purpose

The proposed project calls for providing potable water systems, latrines and health education to about 420 small communities of 500 or fewer inhabitants which are located in six selected health regions in the sierra and high jungles of Peru. The project will be initially carried out in Cuzco, Junin, and Cajamarca and expanded to an additional three provinces once implementation begins.

The project also has the following two subpurposes: 1) to integrate the above mentioned activities into the Ministry of Health's primary health care (PHC) activities in the above mentioned villages; and 2) to strengthen the infrastructure of the regional health offices by "promoting the creation of an environmental sanitation team which would remain intact following the conclusion of the project."

#### 1.3 Project Goals

By the end of the project, it is expected that the following conditions will exist:

- (1) There will be upgraded decentralized regional environmental health offices operating in six of the regional health areas;



- (2) The DIS will be able to develop, implement, and maintain the proposed village drinking water and sanitation systems using the increased financial, human, and material resources made available as a result of the project;
- (3) Training efforts will have been developed and implemented to ensure that program technicians can carry out those community organization activities needed for the construction and maintenance of the water and sanitation systems that will have been built under the project;
- (4) Latrine utilization will have been improved throughout the project area as a result of information developed through the project; and
- (5) Health conditions and general well-being will have been improved in the project area as a result of the increased availability of potable water and sanitation.

#### 1.4 Project Resources

To achieve these goals, the loan-funded inputs for the project will include:

- (1) The purchase of six four-wheel-drive pick-up type vehicles, six dump trucks, and a stock of spare parts for each of the six regional offices for transporting personnel, materials, equipment, and supplies. Two four-wheel drive vehicles will be purchased for the national office. In addition, up to 30 off-road type motorcycles and a stock of spare parts will be purchased for the environmental sanitation technicians located in the six regional offices for use in the community organization and system construction and maintenance aspects of the project.
- (2) Limited travel costs for DIS personnel and operating and maintenance expenses for the vehicles.
- (3) Simple portable water testing equipment for both field and office use, as well as training equipment and materials and a limited amount of engineering and office equipment for the regional offices.
- (4) Plastic pipe and accessories for system construction, as well as galvanized pipe and accessories for household connections, most of which will be imported.
- (5) The cost of contracting skilled labor for system construction.

Project grants will provide technical assistance in the areas of: simplified chlorination systems; integration of activities supported under the Rural Health Project; system design; administrative systems; procurement; material and equipment control; simplified system maintenance procedures; and environmental sanitation education. Additional grant funds will be provided for short training programs for environmental sanitation engineers and technicians in community organization, material and equipment control, and system operation and maintenance. Studies related to sanitation and water usage, evaluation of impact on health status, water treatment, and alternative water systems will also be carried out with grant funds.

The MOH will finance support costs for technician and community training programs and vehicle operating expenses (gasoline, oil, and maintenance). It will also provide salaries and travel expenses for all project personnel except for local supervisors paid by the communities.

The communities in the project will provide unskilled labor and locally available materials such as rock, sand, and gravel for system construction. They will also make a small monetary contribution to cover the cost of system construction. The total community contribution, both monetary and in-kind, will generally be about 11 percent of the system construction costs. The community will also organize and manage an administrative system to operate and maintain the installed system.

### 1.5 Project Outputs

The project seeks to achieve the following objectives:

- (1) Approximately 420 water systems functioning in communities of less than 500 inhabitants in six health regions.
- (2) Five environmental sanitation technicians in each regional MOH office who are trained in community organization and system maintenance procedures.
- (3) Six regional DIS offices that have units that are staffed and equipped for operation and maintenance of the systems that are built.
- (4) Latrines in all communities served with potable water systems.
- (5) Community education programs focussed on water and sanitary waste disposal carried out in all participating communities.

## 1.6 WASH Team Scope of Work as Requested

In its original terms of reference the Mission requested that the team focus its attention on four specific areas:

- (1) A technical review of 30 water system subprojects.
- (2) Suggestions for a proposed DIS seminar to coordinate activities of health administrators, primary health care (PHC) technicians, and water and sanitation technicians.
- (3) A review of DIS local and international procurement plans.
- (4) Assistance to DIS in analyzing the technical assistance (TA) element of the project and drafting terms of reference for the various consultants.

## 1.7 Scope of Work as Modified

As a result of meetings with the project officer, Mr. Paul White, and the AID project team it was agreed to modify the WASH team's scope of work to include the development of recommendations regarding:

- (1) Ten (10) of the first thirty (30) subprojects for which DIS had completed designs.
- (2) The proposed technical assistance package so that it reflected current/future DIS resources and decentralization needs.
- (3) Development and staffing of regional DIS offices.
- (4) Integration of DIS water supply and sanitation (WS&S) activities with MOH's PHC efforts.
- (5) The proposed training plan that DIS will need to develop in support of the project.
- (6) DIS proposals for procurement and warehousing.

In addition the team agreed to review and comment on:

- (1) The Wellin questionnaire for WS&S.
- (2) CEPIS/DIS efforts to develop a joint operations and maintenance (O&M) project.
- (3) A proposed handpump effort as it relates to the project.

## Chapter 2

### TECHNICAL REVIEW OF EXISTING PROJECTS

On arrival in Peru the team found that only 10 of the 30 sub-projects had documentation that was sufficient for a review. Table 1 presents a summary of these projects.

To obtain as multidisciplinary an input as possible the team held discussions with the project manager (Mr. Paul E. White, Chief, Community Services Division) and his project team. In addition they reviewed the USAID Project Paper and the Plan de Implementación developed by DIS.

As a result of these meetings and the review of project documentation the team has the following recommendations:

- (1) A technical review found no major deficiencies in the individual subprojects.

RECOMMENDATION: That subprojects be approved as submitted.

- (2) A review of per capita costs submitted by DIS shows them to be high because they include 105 percent additional charges which reflect general costs and the effects of social legislation as follows:

- 14 percent surcharge on labor and materials for technical direction and administration.
- 5 percent surcharge on labor and materials for community promotion and organization of juntas.
- 6 percent surcharge on labor and materials for inspection and central office.
- 80 percent surcharge on labor for accident insurance and social benefits.

These items are not normally included in per capita costs. Without their inclusion, the team found that the costs submitted by DIS are comparable to the US\$50 per capita figure proposed in the original USAID paper.

RECOMMENDATION: That DIS be requested to identify social costs as a separate item in future submissions so costs can be more easily compared.

- (3) A technical review found that the cost of pipe varied between 25 and 60 percent of the direct project cost, with an average of 43 percent.

TABLE NO. 1

## ANALYSIS OF 10 DIS RURAL WATER SUPPLY PROJECTS

No.	Location	Population		Quantity Design Liters/Sec.	House Conn.		Pipe Required (Meters)				ESTIMATED COSTS					SOLES (Millions)		1981 Total Cost		
					No.	Est. Cost Labor & Mat. Soles	3"	2"	1-1/2"	1"	Pipe Cost Proj. \$ <sup>1</sup>	Administration Project \$ <sup>2</sup>	Material Proj. \$ <sup>3</sup>	Labor Proj. \$ <sup>4</sup>	Insurance + Social	Direct Proj. \$ <sup>5</sup>	Per. Capita Soles			
		Pres. Design																		
1	Marcavalle, Junin	421	585	0.85			1,350		438	224	5.81	41	3.46	19	8.92	3.01	2.42	14.36	34,109	17.82
2	Chiguirip, Cajamarca	510	765	1.30	85	19,294	132	1,215	80		4.46	46	2.36	19	6.06	2.07	1.66	9.80	19,200	12.15
3	Suyan, Ancash	301	391	1.00	43	19,069		618		911	2.33	25	2.02	18	3.92	3.04	2.44	9.40	31,258	11.42
4	Ruraymarca, Junin	350	525	2.00	64	19,062	897	1,223		567	6.23	47	2.42	15	8.26	2.82	2.26	13.34	38,136	15.76
5	Maraflores, Junin	243	340	0.8	25	14,800		492	87	1,424	3.01	26	2.45	17	4.58	3.87	3.11	11.56	47,589	14.02
6	Huacanhuesi, Ancash	400	520	2.5	76	18,947		1,924			4.93	40	2.97	19	7.64	2.59	2.08	12.31	30,767	15.27
7	S.F. de Kivlnaki, Junin	385	539	1.0	55	16,727	1,523	1,032			8.65	50	4.18	19	10.93	3.49	2.80	17.22	44,726	21.40
8	Conga Chalamarca, Cajamarca	400	600	0.8	80	19,000		908	1,586		6.30	53	2.78	19	6.65	2.94	2.36	11.95	29,897	14.74
9	Pampacuyo, Cajamarca	187	281		27	11,667		826	851		3.53	60	1.33	18	2.99	1.60	1.28	5.87	31,435	7.21
10	Colpar, Junin	415	581	1.0	83	19,036		320	768	1,581	6.97	47	3.31	18	7.32	4.12	3.31	14.75	35,540	18.07

NOTES - Data from 10 sets of design plans furnished by DIS

1. Pipe Cost/Direct Cost
2. Administration Cost/Total Cost
3. Material Cost/Direct Cost
4. Labor Cost/Direct Cost
5. Insurance + Social Costs = 80% Labor Cost
6. Material + Labor + Insurance and Social Costs
7. Direct Cost/total Cost
8. Direct Cost/Actual Population (Cost In Soles)
9. Administration Cost + Direct Cost

RECOMMENDATION: That in future submissions careful attention should be given to ensuring that minimum pipe sizes are used. This could result in substantial savings to the project which could be used to construct additional systems or to fund an incentive plan for greater project output (see Appendix D).

- (4) It should be noted that the design criteria used to develop the projects submitted for review were the same as those used for larger villages (1,000 to 2,000 inhabitants). While this was done to make the maximum use of existing staff and procedures, the team feels that as the proposed regional offices are established, significant modifications in criteria and procedures will be necessary to allow the use of standard designs and procedures specifically adapted to the smaller villages (less than 500 inhabitants) envisioned by the AID project.

RECOMMENDATION: That DIS start work on developing revised standards and procedures to govern future efforts in this area. These should be institutionalized as quickly as possible.

## Chapter 3

### TECHNICAL ASSISTANCE PACKAGE AND RECOMMENDATIONS

#### 3.1 General

The Project Paper provides for funding 35 months of technical assistance (TA) efforts. After reviewing the proposed program, DIS resources, and desired results the team recommends that the TA package be restructured and used to enhance project delivery in three areas:

- (1) The development and implementation of the regional offices along with the necessary back-up at the central office.
- (2) The establishment of long-term mechanisms for operation/maintenance and the development of human resources at all levels.
- (3) The operational investigation of critical and/or bottleneck areas.

As these are slightly different from the areas proposed in the Project Paper the team presents the following discussion of these areas followed by a series of recommendations.

#### 3.2 Regional Office Development Expert

The development of local branch offices for DIS in the various regions of the country is of critical importance to the long-term success of this loan.

The basic concept of the proposed regionalization is based on the DIS's decentralization of its operation for this program and the creation of six regional offices that are fully capable of the following activities:

- (1) Carrying out DIS responsibilities for the AID-assisted project.
- (2) Developing the regional and village level human resources that will be required for the long-term operation and maintenance of the proposed drinking water and sanitation systems.
- (3) Providing back-up assistance to existing systems and start-up advice to the new systems.

To do the above, it will be necessary to establish a regional office liaison group in DIS/Lima. This group will be responsible for: 1) establishing and overseeing the operation of

the proposed regional offices; and 2) developing a regionally based training scheme so that appropriate numbers of human resources at all levels (semi-professional designers, village promoters, operation and maintenance personnel for regional and village levels, etc.) will be available as needed at the regional and local levels.

To assist DIS in designing and implementing the above-mentioned concepts, the Project Paper provides for 24 man months of technical assistance to implement this plan. After reviewing project needs, the team developed the scope of work presented in Appendix E. The terms of reference call for a professional who is well experienced in the management of village water supply and sanitation programs in Latin America and who is proficient in writing and speaking Spanish to work directly with DIS acting as a:

- catalyst for the process of establishing and placing in operation the proposed regional branch offices in the DIS regions;
- coordinator and supervisor of the entire TA package; and
- director of the human resources development effort as well as an instructor in various courses.

In the Project Paper it is proposed that the time of the consultant be divided into three periods (one of 18 months and two of three months each). In view of the difficulty of finding a professional for such a short time the team suggests that the period of the consultant should be a continuous 24 months. The team feels that using a consultant from Peru or from some other Latin American country instead of bringing one in from outside would be less expensive and the quality of the technical assistance would be better for the program. The funds saved should be used to help finance an incentive plan for the program as explained below and in Appendix D.

RECOMMENDATION: That USAID should provide DIS with the services of a well experienced village water and sanitation engineer or manager for a period of 24 continuous months. This person should be fluent in written and spoken Spanish and English, should have had experience with the proposed regional office concept, and preferably be a Latin American.

### 3.3 Regional Incentive Plan

The success of a decentralized organization depends on (1) a close linkage between the central office and the regional offices with a clear definition of the duties and responsibilities of each and (2) continuing supervision from the central office. Standards, guidelines, and goals are set at the



national level to be implemented at the regional level. A properly designed and applied incentive plan helps to assure that the goals established at the national level are met at the regional level and prevents delays of months and even years which occur when there is no incentive for the regional offices to meet goals established in Lima. Such a program was successfully established several years ago in Argentina, and a modified form of the incentive plan has been in use for the water supply program in Sri Lanka. The details are covered in a report which is attached as Appendix D.

The team suggests that the funds saved by engaging a regional office development expert from Latin America instead of from outside the area should be used to finance the cost of an incentive plan. This would accelerate the installation of the regional offices and ensure their design, construction, operation, maintenance, and training capabilities, as well as accelerate the implementation of the water supply and sanitation subprojects under the present loan. It is strongly suggested that DIS be requested to match these savings in order to ensure their long-term participation in such a fund.

RECOMMENDATION: That USAID/Peru reschedule the savings which will result from the local or regional recruitment of a regional office development expert from Latin America to finance an incentive plan and that this financing be supplemented by matching funds from DIS. It is further recommended that the services of Engineer Guillermo Orozoco of Medellin, Colombia, be obtained to explain the plan in detail and assist in adapting it for use in Peru. He helped to originate and implement the plan in Argentina and recently assisted in a similar way in Ecuador.

### 3.4 Human Resources Development Expert

In order to staff and keep the proposed regional offices operating for the life of the systems they will service, it will be necessary to design, install, and operate over the long term a human resources development scheme.

This activity should be divided into two areas: 1) establishing a locally based operation and maintenance capacity so that there will be a minimum of "down time" for individual village systems and so that the systems will provide the maximum of health benefits to users; and 2) recruiting and training the regional office oriented semi-professional technicians who will serve as the key element in the development and dissemination of the "rural water/sanitation" system user concepts. Each of these activities will focus on how the village operator can and will be supported in the performance of his duties versus technical training per se.

RECOMMENDATION: That the human resource development expert should work under the regional office development expert referred to in Item 3.2. He will need initially three months to design the proposed operation and maintenance and other training schemes and afterwards two one-month visits to assist DIS to install the proposed scheme. Finally, there will be a need for him to make a one-month visit to develop corrective actions to make the system more effective at the regional and village level.

### 3.5 Environmental Sanitation

After reviewing the Project Paper's recommendations regarding environmental sanitation (ES) it was felt that the overall project effectiveness would be improved by reallocating one month of the time assigned for the environmental sanitation expert to that of the maintenance expert called for in the technical assistance program. This raises the technical assistance component level of effort in the maintenance area from five (5) to six (6) months.

RECOMMENDATION: That one month of the time originally allocated for environmental sanitation education should be reassigned to strengthen the work of the proposed maintenance expert.

### 3.6 Operation and Maintenance Expert

The operation and maintenance expert should be experienced in the operation and maintenance of rural water supply and sanitation systems and in the training of semi-professional technicians and unskilled system operators at sites near their villages. He will be expected to travel to and stay at the regional offices for extended periods of from three to four weeks.

The semi-professional technicians who will be trained for this work will be drawn from the region and will be expected to serve in the proposed regional office under the supervision of the regional engineer and the technical guidance of the DIS/Lima operations and maintenance director.

RECOMMENDATION: That the human resources development expert who will assist the regional office development expert concentrate on (1) strengthening the village operator's long-term operation and maintenance capability; and (2) developing semi-professional technicians who will serve as regional office promoters, designers, and educators.

## Chapter 4

### DEVELOPMENT AND STAFFING OF REGIONAL OFFICES AND RECOMMENDATIONS

#### 4.1 DIS Plans

In 1981 DIS had the personnel shown on the attached map in the various areas of the country working on rural water supply programs. In some cases they were direct hire employees of DIS. In other cases they were paid by MOH but seconded to DIS and supervised by DIS. In other geographical locations the MOH staff assisted DIS with its water supply programs. For example, the engineer in Cajamarca is a DIS employee, and he has a "técnico sanitario" assigned to work with him by MOH (not shown on the map). In Ancash the staff shown is part of the MOH available to work on DIS projects when needed.

DIS plans to install its own staff--providing the minimum staff required in Cajamarca for the first year and then enlarging as necessary to handle the growing number of systems which are planned for each year. As the program gets under way and it is possible to recruit staff, the regional office in Ancash will be staffed with DIS personnel. MOH personnel will be used until DIS staff are available. Next, or simultaneously if possible, the Regional Office in Junin will be developed. This process will be continued until all of the six regional offices are functioning.

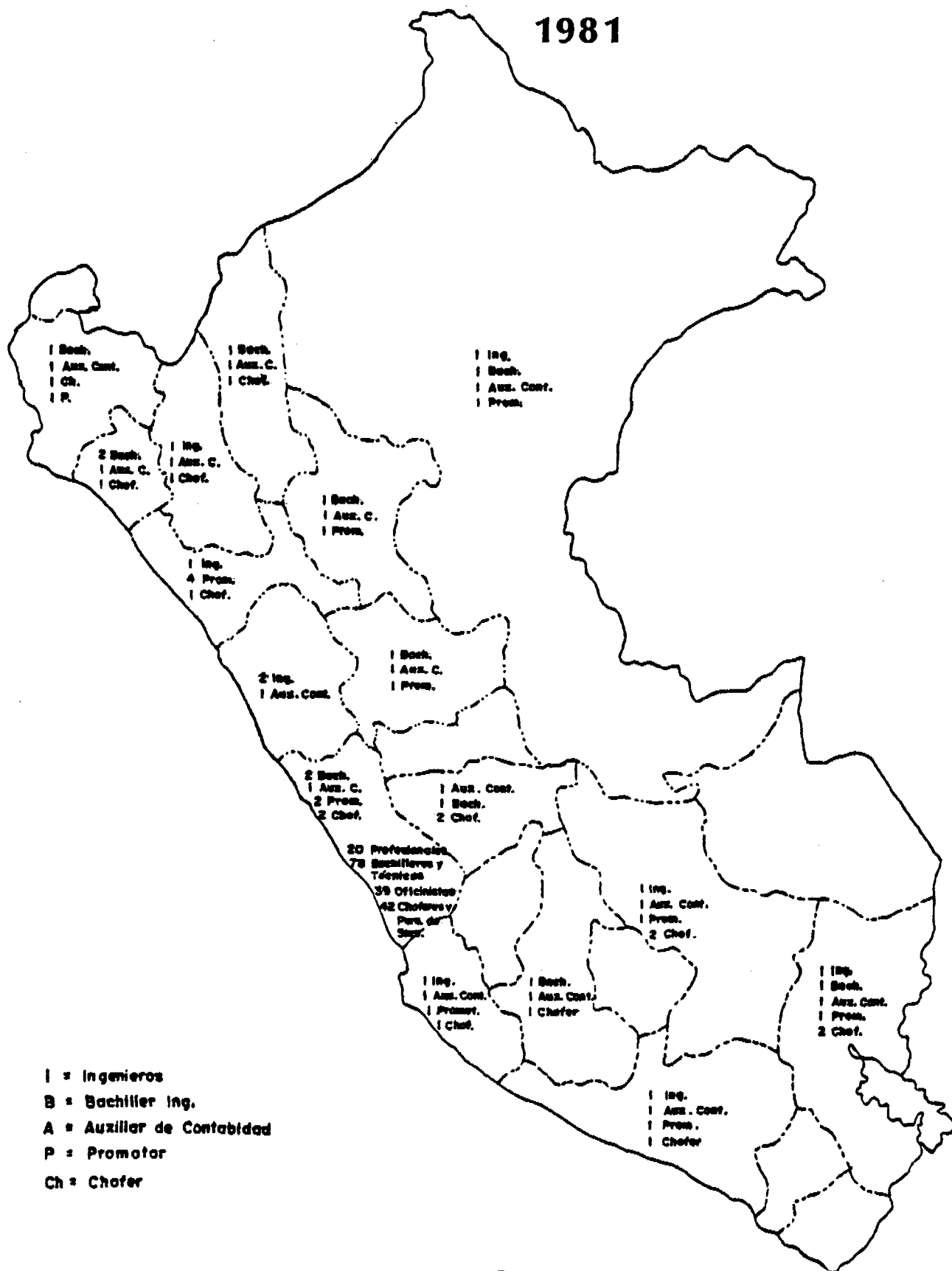
Whenever possible, advantage will be taken of the MOH "técnicos sanitarios" who have worked with MOH in the regions and so are familiar with the area and the people. Arrangements will be made with MOH for transfer to DIS staff, seconding with DIS payment, and seconding with MOH payment or loan.

#### 4.2 Appropriate Staffing Pattern

The staffing pattern shown in the Project Paper (see figure 1) is the optimal pattern which may be needed when a regional office is in its third year of operation. By that time the office should be responsible for the construction of 30 systems and for providing back-up assistance for the O&M of an additional 30, while assisting in developing designs and studies for an additional number of systems.

Taking advantage of the fact that the office will probably be located in an MOH hospital, the team suggests that the basic staff for starting a regional office consists of the following:

# PLAN NACIONAL DE AGUA POTABLE RURAL RECURSOS HUMANOS 1981



1	Regional engineer
1	Técnico sanitario
1	Draftsman
1	Promoter
1	Secretary
2	Chauffeurs
2	Skilled laborers
2	Unskilled laborers

The accounting and watchman needs will be taken care of by hospital personnel.

As the workload increases, the staff will be increased to take care of the regional office needs and in the third year will probably reach the level indicated in the Project Paper.

DIS is contemplating the need for setting up subregional offices in three of the regions because of the difficulty of reaching some of the areas in those regions from the regional offices. While the team concurs with this concept, the size and composition of the subregional office staff will depend on where the subregional office is located and the possibility of using MOH facilities and staff. It will probably be similar to the staff indicated for the start-up period of the regional offices.

RECOMMENDATION: That the regional offices of DIS be started with a basic staff to meet the demands at the time the office is being organized, taking advantage of whatever help may be available from MOH until DIS staff can be recruited and trained. One regional office should be organized with the basic staff indicated (or an existing regional office should be brought up to this strength) as soon as possible. Additional offices should be brought up to basic strength so that at the end of the first year regional offices will be organized and functioning in three regions. The other three offices will be organized as the program is extended to the remaining regions of the program.

## Chapter 5

### INTEGRATION WITH PRIMARY HEALTH CARE

#### 5.1 General

The need for close cooperation between the present Rural Water Supply and Sanitation Program and the Primary Health Care Program and the need for integration of the two programs is self-evident.

Discussions were held with members of USAID, DIS and MOH to understand the problems that exist and those that are anticipated. The proposed workshop discussed in the next section is considered to be an important step in identifying potential problems and in trying to solve or avoid them.

A second step is suggested in Section 5.3. This section outlines the formation of an association of the personnel involved in the Water Supply and Sanitation Program (ARAS).

Additional suggestions are made in Section 5.4 below in an attempt to prevent problems in the future with the latrine element of the program.

#### 5.2 Orientation Workshop

Inasmuch as the present Rural Water Supply and Sanitation Program is quite different from previous programs in that it is directed at villages with populations below 500, it involves standards, approaches, and methodologies quite different from those required for programs designed for large population concentrations. It is not a question of scaling down. The success of these efforts will depend on the application of technologies appropriate to the needs of the villages involved.

Thus, new approaches must be developed. Guidelines must be prepared, and those who are to implement the program must be helped to understand the philosophy and the simple technologies which are so fundamental for the success of the program.

The workshop will provide a forum for presenting the philosophy and techniques to those who will be responsible for implementing them. Therefore, advantage should be taken of the workshop to indoctrinate not only DIS staff but the primary health care (PHC) staff in the region.

It is planned to hold the workshop in one region first and then later on in each of the other regions of the program. Present thinking is that the following persons will participate:

USAID--Project managers for the Primary Health Care and the Rural Water Supply and Sanitation programs.

DIS--Personnel from the central office involved in the WS&S program, the regional engineers and other regional staff including the técnicos sanitarios concerned with the program.

MOH--Director of Health of the region. Técnicos de salud assigned to the DIS staff but paid by MOH. Others whom the director might indicate.

Observers--To be invited.

It is proposed that the workshop last approximately four days. The team proposes that the time be distributed as follows:

- Day 1: Presentation by DIS of the objectives, approaches, and technology to be used to promote, design, operate, and maintain and back up the individual systems.
- Day 2: Presentation of DIS administrative procedures for supporting the regional offices.
- Day 3: Discussion of material presented. An opportunity will be provided for each principal participant:
- to define his role in the program as he sees it;
  - to define his concepts of the roles of the other principal participants;
  - to develop a list of the principal differences as expressed by the participants;
  - to study the differences and suggest methods of resolving the differences.
- Day 4: Discussions of strategies of how all three groups (i.e., AID, DIS, and MOH) will work together to ensure appropriate linkage between the project and MOH's primary health care efforts.

This exercise should reveal some of the causes which are preventing an effective coordination between the DIS WS&S program and the MOH PHC program and result in the beginning of more effective coordination.

RECOMMENDATION: That full advantage be taken of the proposed orientation workshop to explain the philosophy and technologies to be used in the implementation of the present project in villages of less than 500 population, not only to the DIS

staff but also to the MOH staff who may be involved with the project in the regions. Advantage should be taken of this workshop, and of those to be held in the future, to develop a close working relationship between DIS and MOH personnel.

### 5.3 Regional Water Supply and Sanitation Association (Asociación Regional de Agua y Saneamiento--ARAS)

It is suggested that the members of the DIS Regional Water Supply and Sanitation offices and their counterparts in the Ministry of Health be encouraged to form an association with a subsection for system operators and members of the village water supply and sanitation committees.

The association could provide a forum for discussing common problems, for providing closer relationships among the various people involved and their agencies. Meetings could be sponsored periodically. Eventually the ARAS could be extended to cover all the regions in the country.

The present Inter-American Association of Sanitary Engineering (AIDIS) could serve as an example and might even be interested in helping to organize an ARAS.

RECOMMENDATION: That assistance be provided for investigating the possibility of developing an ARAS, and, if considered feasible, for helping in its formation.

### 5.4 Development of an Integrated Latrine Program

The present program provides for the installation of a latrine in each dwelling being supplied water by the same program. Peru's Plan de Implementación provides for the installation of a total of 20,140 latrines during the five years of the program. The maximum annual production required in any of the six regions is 1,370 latrines. This does not justify the installation of a special "taller" (factory or workshop) considering the fact that MOH already has facilities for making the necessary slabs in most of its regions.

RECOMMENDATION: That arrangements be worked out with MOH to make in its "talleres" the slabs needed for the present program to supplement those made by the householders in the villages with the understanding that the slabs will be available on a schedule to be mutually agreed upon with the method of payment to be negotiated. It is further recommended that the results of the studies mentioned in Section 8.1.1 below be used as the basis for designing the slabs to be used for the program. That the "técnicos sanitarios" of the DIS regional offices under the direction of the regional engineer be responsible for programming the installation of the latrines either before or during the actual construction of the water supply scheme in each village and that he be responsible for



stimulating the villagers, with the assistance of the local health promoter to install, use, and maintain their latrines. He will also be responsible for assisting in the installation of the multiple installations which are programmed for schools and other places.

## Chapter 6

### TRAINING PLAN

#### 6.1 In-Country Workshops

The first in-country workshop has been commented on in Chapter 5. Provision is made in the Project Paper for other workshops. Decisions will be made on content and timing as the program advances and in accordance with the needs of DIS and the consultants provided under the technical assistance portion of the program.

#### 6.2 Observation Trip Sites

As DIS is in the process of changing from a centralized to a decentralized organization it is important that the staff, particularly the administrative staff at both the central and regional levels, have an opportunity to observe the effectiveness of decentralized operations in other countries.

RECOMMENDATION: That administrative staff of DIS at both central and regional levels be provided the opportunity to observe decentralized rural water supply operations in Colombia, Venezuela, and Panama. One of the observation trips should be scheduled to coincide with the AIDIS Congress to be held in Panamá. This would provide an opportunity for the DIS engineers to participate in the congress, to exchange ideas with other engineers working on water supply and sanitation projects and to discuss the philosophy of AIDIS leading to the formation of the Regional Association for Water Supply and Sanitation in Peru as mentioned in Section 5.3.

#### 6.3 Professional Training

While the main thrust of the training package included in the Project Paper is for intermediate and community level personnel, it is suggested that training should also be provided for at least a few professionals so that DIS can start to prepare technical managers for the time when the program will cover at least six regions.

RECOMMENDATION: That at least one engineer be provided with the opportunity to study in a Latin American university and that one be sent abroad to obtain a master's degree in sanitary engineering.

## Chapter 7

### PROCUREMENT AND WAREHOUSING

#### 7.1 Procurement

A list of material and equipment was prepared by DIS based on experience, presented in the Plan de Implementación as of March 1981, and was modified and approved in August 1981. This list is now being modified (in light of the 10 detailed system projects) to provide material and equipment for the first 30 systems which were scheduled to be built in the first three regions. This material was to be ordered locally the week of January 31, 1982.

The next step, which is now in progress, will be based on the design of five more systems. This will consist of preparing a list of materials for the 70 systems designated for 1982 and the 90 for 1983. The material will be obtained by international bidding. The date for this bidding is still not determined.

A major bottleneck in this effort is the lack of sufficiently detailed project information from which lists of materials can be prepared quickly. This bottleneck is caused by the lack of staff to prepare the studies and designs and further exacerbated by the difficulties of making the necessary field studies from January through March.

While nothing can be done about the weather, DIS should take advantage of this time to recruit and train the staff that will be needed to do the studies and designs. If possible, this staff should be recruited from the regions to which they will be assigned and brought to Lima for a short practical training and orientation period with the DIS staff now involved in designs and studies.

In addition, an incentive plan adapted to the needs of the program could do much to accelerate the development of detailed plans. The incentive plan would make it possible to attract candidates for the positions involved (studies and designs) because it would make it possible to reward the staff members above their basic wages for producing more than is usually produced.

The need for early procurement of materials underlines the need for the early development of training programs for the staff which are urgently needed to provide the studies and designs.

While recruiting and training are under way it is suggested that the studies and designs might be done by contract with a local firm of engineers and closely supervised by the existing DIS staff.

RECOMMENDATION: That the staff necessary to develop studies and designs for the 170 systems scheduled for 1982 and 1983 be recruited at once and trained for their specific duties. This will allow the necessary material and equipment lists to be prepared at an early date thus allowing the material to be purchased on the international market in time to be available for use in the second half of 1982 and in 1983.

RECOMMENDATION: It is further recommended that an incentive plan be introduced to facilitate the recruitment of the needed staff and to speed up the preparation of studies and designs, as well as other aspects of the program.

RECOMMENDATION: In the meantime, it is recommended that local contracts be let for the preparation of studies and designs under the supervision of existing DIS staff.

## 7.2 Warehousing

Warehouses will be required in each of the regions to store material until it is needed on the projects. Final warehousing at the project sites is provided by the villagers as part of their contribution to the subprojects.

DIS is in the process of obtaining warehousing facilities in the regions included in the program. It is suggested that consideration be given to extending the warehouse to include a small office for the operation and maintenance back-up to be provided in each regional office to support village maintenance efforts. In addition, this regional O&M office should have the facilities necessary to make repairs which cannot be done in the village, but which do not require major work.

RECOMMENDATION: That the warehouses which are not to be constructed in each of the program regions shall include adequate space for maintenance work which may be required for equipment installed in the region under the present program.

## Chapter 8

### STUDIES/EVALUATION

#### 8.1 Studies

##### 8.1.1 Comments on Wellin and Latrine Studies

The questionnaire being prepared for the Wellin Study was reviewed and found to be complete as far as the water supply situation is concerned. While admittedly that is the objective of the study, it was found that only one quarter of a page of the study is devoted to excreta disposal.

It is suggested that advantage should be taken of the Wellin study and its methodology to obtain valuable information on excreta disposal. This information would include personal preferences and customs which are even more critical to the success of an excreta disposal program than to that of a water supply program. See Appendix F for some items which might be added to the Wellin Study.

Provision is made in the Project Paper for a latrine study to determine defecation habits, attitudes toward latrines, and their utilization and maintenance. This should be done. The suggested additions to the Wellin Study would supplement the study proposed in the Project Paper.

Discussion with DIS staff indicates that to date no provisions have been made for the latrine study and that more urgent matters are being given a higher priority. The study should be carried out soon if it is to serve as a basis for the latrine program proposed in the Project Paper.

RECOMMENDATION: That the items suggested in Appendix F be added to the Wellin Study and that arrangements be made soon to carry out the latrine study as proposed in the Project Paper.

##### 8.1.2 Comments on CEPIS O&M Work

The team attended a meeting at Centro Panamericano de Ingeniería Sanitaria (CEPIS) on January 21, 1982, where the project was discussed with Engineer Marroquin (Director, DIS Water Supply and Sanitation Program), Engineer Bacigalupo (Director of DIS), and representatives of CEPIS.

Discussions are still taking place regarding CEPIS's undertaking the urban O&M portion of the program and DIS the O&M aspects of rural systems. The overall program will be coordinated by CEPIS. It has been agreed that CEPIS would prepare a modified work plan based on the discussions for DIS review and input.

RECOMMENDATION: That the resources of the present project designated for studies and evaluation be redistributed to make it possible for DIS to participate in the CEPIS O&M project. This should be done only if the current project can be reoriented to include small village (less than 500 inhabitants) water supplies.

### 8.1.3 Suggested Handpump Study

Inasmuch as an important element of a water supply program for rural villages with fewer than 500 inhabitants will require the installation of a number of wells with handpumps for village use, it is suggested that consideration should be given to the stimulation of the local manufacturer of handpumps that will stand up under village use. AID has an ongoing program to assist in the development of this type of manufacture. A locally manufactured handpump has many advantages in addition to stimulating local industry. The pump can be adapted to local needs and is generally much less expensive than an imported pump. Spare parts are readily available and do not have to be imported.

In several other countries AID has assisted in surveying the need for locally manufactured handpumps, in locating local foundries with the capability of manufacturing the pumps, and in setting up foundries to manufacture the pumps. AID/Peru may wish to consider such assistance in Peru.

RECOMMENDATION: That AID ascertain the need for and the possibility of the local manufacture of handpumps in Peru and if feasible should consider assisting in the development of such a program.

## REFERENCES

1. Telegram USAID/Lima - SECSTATE WASHDC  
Unclassified Lima 12212 Dec. 81  
Subject Technical Assistance - Rural Water and Environmental Sanitation Project (527-0221)
2. OTD No. 74 - Dec. 15, 1981 - Victor Wehman, S&T/HEA:AID, WASH Project Manager, to Dr. Dennis Warner, WASH Contract Project Director
3. Terms of Reference - January 11, 1982 - Dr. Warner to Charles S. Pineo, Consultant  
USAID/Peru Project Paper, Rural Water Systems and Environmental Sanitation AID/LAC P-062 dated 9/22/80
4. República Peruana - Ministerio de Salud - Dirección General de Programas Especiales de Salud  
Convenio Peru AID - Sistemas de Agua Rural y Saneamiento Ambiental - Plan de Implementación March 1981
5. Memo Dated Dec. 18, 1981 from Edilberto Alarcón, Jefe, Dirección de Ingeniería y Ejecución de Proyectos, USAID/Peru to Paul White, Jefe, División de Servicios a la Comunidad - Préstamo AID No. 527-U-074 Sistemas de Agua Rural, Análisis de Costos de Construcción
6. Wellin - Proyecto de Estudios de los Sistemas de Abastecimiento de Agua en los Poblados de Ica
7. CEPIS - Lima, PERU, April 1980 - Abastecimiento de Agua a la Población Rural del Peru - Situación Actual

Appendix A

WATER AND SANITATION FOR HEALTH (WASH) PROJECT  
ORDER OF TECHNICAL DIRECTION (OTD) NUMBER 74

December 15, 1981

TO: Dr. Dennis Warner, Ph.d., P.E.  
WASH Contract Project Director

FROM: Victor W.R. Wehman, Jr., P.E., R.S. *DWW*  
AID WASH Project Manager  
S&T/HEA/CWSS

SUBJECT: Provision of technical Assistance Under WASH Project Scope of Work  
for USAID/Peru

REFS: A) LIMA 12213, 10 Dec 81

1. WASH contractor requested to provide technical assistance to USAID/Peru as per Ref. A para. 2.A-D.
2. WASH contractor/subcontractor/consultants authorized to expend up to a total of 40 person days of effort over a 3 month period. Recommend this be accomplished by one WASH CIC staff officer and one experienced, Spanish fluent sanitary engineer private consultant.
3. Contractor authorized up to 35 person days of international per diem to accomplish this effort.
4. Contractor to coordinate with LAC/DR/HH (C. Mantione - 632-9486), LAC/DR/ENGR (C. Mathews) and Peru AID desk officer and should provide copies of this OTD to them as well as keep them informed of periodic progress, ETA's of consultants etc. Contractor should ensure that country clearance for consultants is obtained from mission before travel is initiated. Mission contact in Peru is Mr. Paul White, AID Project Manager. National Directorate of Sanitary Engineering (DSE) (implementing organization) contact is Mr. Carlos Marroquin, DSE Project Manager.
5. Contractor to field consultants to Peru by 8 January 82.
6. Contractor authorized to provide up to two (2) international round trips for consultants from Washington, D.C. to Lima, Peru and return to Washington, D.C. to accomplish tasks referred to in para. 1 of this OTD.
7. Contractor authorized local travel in Peru as necessary to accomplish mission, i.e., rental of vehicles, small aircraft, horses, etc., NTE \$3,000 without prior approval by cable of AID project manager. USAID/Peru encouraged to support consultant's local vehicle travel to the extent possible within the resources available to USAID/Peru.
8. Contractor authorized to obtain secretarial, graphics or reproduction services in Peru to extent necessary to accomplish mission NTE \$800 without approval of AID WASH project manager.



9. Contractor to provide final draft report to USAID/Peru before returning. Final report due within 30 days of return of consultants to U.S.
10. Contractor to hold briefing and debriefing session for team inviting LAC and S&T/HEA concerned officers.
11. Mission should be contacted immediately (a copy of this OTD telexed to them -- Attn. Paul White) and technical assistance initiated with consultants in country by 8 January 1981.
12. Appreciate your prompt attention to this matter. Good luck

VWW:ja

UNCLASSIFIED  
Department of State

INCOMING  
TELEGRAM

PAGE 01 LIMA 12213 101651Z 4490 059244 AID6142  
ACTION AID-35

ACTION OFFICE	LACO-02	LADR-03	AAST-01	C-01	CALI-02	CMGT-02
INFO	LASA-03	LADP-03	STHE-01	STRD-02	ENGR-02	HHS-09
	CTR-02	STAG-02	MAST-01	AGEE-01	/041 A1	EPA-03
	RELO-01					

INFO OCT-00 AMAD-01 /036 W -----205550 101653Z /38

P 101558Z DEC 81  
FM AMEMBASSY LIMA  
TO SECSTATE WASHDC PRIORITY 9969

UNCLAS LIMA 12213

AIDAC

FOR: LAC/CONT AND DS/HEA/EH/WASH PROJECT OFFICER

EO 12065: N/A  
SUBJ: TECHNICAL ASSISTANCE - RURAL WATER AND ENVIRONMENTAL  
SANITATION PROJECT (527-0221)

1. USAID/PERU REQUESTS IMMEDIATE TECHNICAL ASSISTANCE FROM THE WASH PROJECT TO ASSIST THE MISSION EVALUATE THE FIRST 30 PROPOSED GRAVITY WATER SYSTEMS TO COMMUNITIES OF LESS THAN 500 INHABITANTS FINANCED UNDER RURAL WATER AND ENVIRONMENTAL SANITATION PROJECT (527-0221). SPECIALIZED WASH ASSISTANCE IS NEEDED TO BE CERTAIN PROPOSED SYSTEMS ARE NOT OVERDESIGNED AND TO ASSURE MISSION THAT EVERY POSSIBLE APPLICATION OF APPROPRIATE TECHNOLOGY HAS BEEN TAKEN INTO ACCOUNT. WASH ASSISTANCE WILL ALSO BE UTILIZED BY THE MINISTRY OF HEALTH'S NATIONAL DIRECTORATE OF SANITARY ENGINEERING (DSE) TO DEVELOP A SEMINAR TO PROMOTE GREATER COORDINATION BETWEEN WATER AND HEALTH OFFICES AND TO ASSIST DSE IN THE PREPARATION OF A PROCUREMENT PLAN TAKING INTO ACCOUNT WASH'S DESIGN AND APPROPRIATE TECHNOLOGY RECOMMENDATIONS. MISSION EXPECTS THAT EXPERTISE PROVIDED BY WASH AT THIS STATE WILL BE MOST BENEFICIAL.

2. SCOPE OF REQUIRED SERVICES AS FOLLOWS:  
A. PERFORM A TECHNICAL REVIEW OF 30 WATER SYSTEM SUB-PROJECTS. THIS REVIEW SHOULD PROVIDE RECOMMENDATIONS ON THE FEASIBILITY OF SELECTED SYSTEM DESIGNS FOR BENEFICIARY COMMUNITIES AND ON TECHNOLOGIES TO LOWER PER CAPITA COSTS.  
B. ASSIST DSE DEVELOP A METHODOLOGY AND CONTENT FOR A SEMINAR, TO BE GIVEN BY DSE TO ENCOURAGE CLOSER COORDINATION AMONG HEALTH ADMINISTRATORS, PRIMARY HEALTH TECHNICIANS, AND WATER SUPPLY AND SANITATION TECHNICIANS.  
C. REVIEW AND COMMENT ON ADEQUACY OF DSE'S LOCAL AND INTERNATIONAL PROCUREMENT PLANS.  
D. ASSIST DSE IN ANALYZING TA REQUIREMENTS IN PLANNING AND ADMINISTRATION, SYSTEM DESIGN, MAINTENANCE AND EDUCATION AREAS, AND IN DRAFTING SCOPES OF WORK FOR IMMEDIATE TA NEEDS.

3. CONSULTANT'S PRINCIPAL CONTACTS WILL BE PAUL WHITE, AID PROJECT MANAGER, AND CARLOS MARROQUIN, DSE PROJECT MANAGER.

4. MISSION ESTIMATES THREE WEEKS OF CONSULTING TIME FOR ONE CONSULTANT OR A SHORTER TIME IF TWO CONSULTANTS ARE AVAILABLE. SPANISH FLUENCY IS MANDATORY. SERVICES SHOULD BE PROVIDED DURING MONTH OF DECEMBER OR JANUARY.

5. IF NECESSARY MISSION PREPARED TO ISSUE PIO/T TO PROVIDE FOR IN-COUNTRY TRAVEL COSTS.

6. PLEASE ADVISE WHEN ORDER OF TECHNICAL DIRECTION IS ISSUED.  
ORTIZ

*Received ST/HEA (W. Chaman) 12/14/81  
Passed to WASH 12/14/81*

UNCLASSIFIED

Appendix B

Itineraries

Charles Pineo

Washington, D.C. to Lima  
Lima to Washington, D.C.

January 14, 1982  
February 2, 1982

David Donaldson

Washington, D.C. to Lima  
Lima to Washington, D.C.

January 17, 1982  
January 30, 1982

APPENDIX C

Persons and Institutions Visited

USAID/Lima  
386 Ave. España  
Lima, Peru  
Telephone: 286200

- Mr. Paul E. White, Chief, Division of Community Services and Project Leader, Rural Water Systems and Environmental Sanitation Loan
- Ms. Janet Ballantyne, Chief, Health Education and Nutrition Office
- Ms. Genny Martinez, Acting Chief, Division of Family Health
- Eng. Edilberto Alarcon, Chief, Engineering Division
- Ms. Mary Likar, Capital Development Division
- Mr. Mike Rogal, Controller
- Mr. Tom Geiger
- Veronica Ferrero, Special Projects Officer

Centro Panamericano de Ingeniería Sanitaria (CEPIS)  
Los Pinos # 259  
Urb. Camacho, Monterrico  
Telephone: 354135

- Ing. Rodolfo Saenz, Director Interino
- Ing. Carl Bertone, Technical Coordinator
- Ing. Adalberto Cavalcanti, Asesor en Area Sistema Comercial

Banco Interamericano de Desarrollo (BID)  
3245 República de Panamá  
Lima, Peru  
Telephone: 415639

- Ing. Rubén Flores

Servicio Nacional de Agua Potable y Alcantarillado  
Ministerio de Vivienda  
Lima, Peru  
Telephone: 723998

- Ing. Alfonso Zavala
- Ing. Jerónimo Mazzini

Ministerio de Salud (MOH)  
Avda. Salaverry s/n  
Jesús María  
Telephone: 323535

- Dr. Jesús Toledo Tito, Secretario de la Comisión Nacional de Atención Primaria

Dirección de Ingeniería Sanitaria (DIS)  
Avda. Salaverry 1238  
Jesús María  
Telephone: 716810

- Ing. Javier Bacigalupo, Director DIS
- Ing. Carlos Marroquín, Director Programa de Agua y Saneamiento Rural
- Ing. Pablo Valdivia Chacón, Jefe del Dpto. de Obras y Agua Potable
- Ing. José Tejada Villegas, Jefe del Dpto. De Ingeniería Sur de la División de Preservación y Supervisión de Obras.
- Ing. Reynaldo Escobar, Jefe del Dpto. de Proyectos y Estudios
- Sr. Vargas, Promoción y Desarrollo de la Comunidad
- Ing. Alfonso Figueroa Coello, Sub-Director de Dirección Ingeniería Sanitaria

Incentive Plan

Introduction

During the two and one-half years following the signing on August 26, 1965 of the Inter-American Development Bank loan for financing the first stage of the rural water supply and sanitation program in Argentine only four water supply systems were completed. True, assistance had been provided for organizing Provincial rural water supply offices, for making surveys for a number of systems, projects had been designed by some of the Provincial offices and approved by SNAP in Buenos Aires. Construction had been started on a few projects. However, progress was much slower than required to meet the goals established at the time the BID loan was made. Drastic action was required to speed up all phases of the project. While the incentive plan was conceived to meet this need, the methodology used may be adapted easily to meet other needs as well.

Background

Argentina is divided into 22 provinces, each of which is autonomous and has its own constitution and institutions for providing services for its inhabitants. However, before the development of the Plan for Rural Water Supply and Sanitation which resulted in the formation of SNAP (Servicio Nacional de Agua Potable and Saneamiento Rural) on December 2, 1964, there were only a few Provincial constitutions that contained specific clauses covering the provision of these services to rural communities. Some work was being done but on an ad hoc basis and it was estimated in December 1964 that less than 7% of the rural population had satisfactory water supply services while more than 70% of the urban population was being served.

The Rural Water Supply Plan, developed by the Ministerio de Bienstar Social y Salud Publica, based on the concepts of the Carta of Punta del Este, with the technical assistance of the Pan American Health Organization; fixed as the first step of the Plan the goal of providing 400,000 people in rural communities (100-3,000 population) with satisfactory water supply services using national, provincial and local funds supplemented by an international loan (provided by the Inter-American Development Bank (BID) in August 1965).

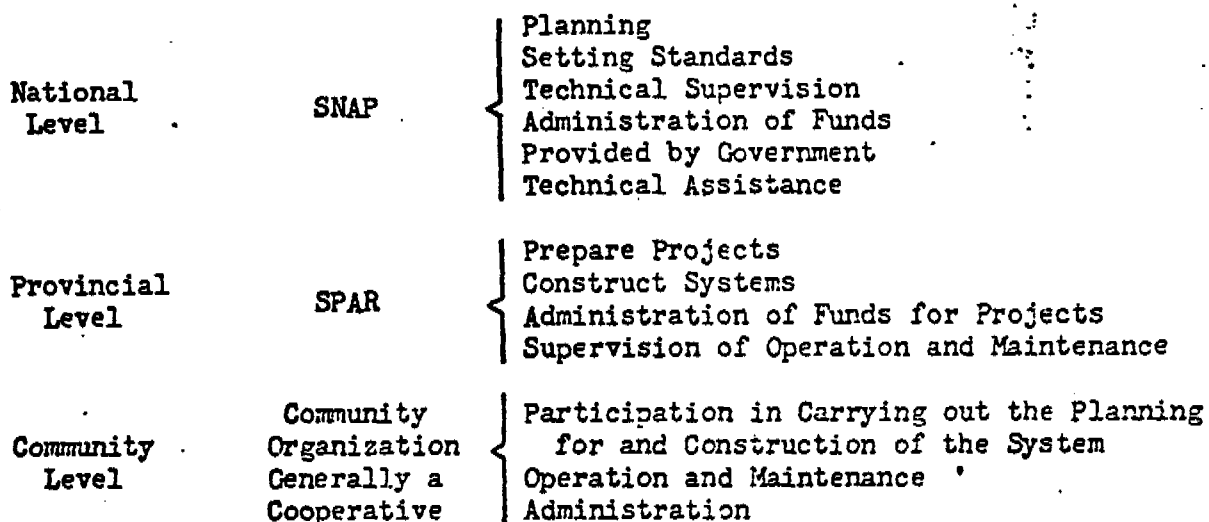
The first year after the BID loan (\$5 million with \$5 million counterpart) was signed was spent in helping the provincial offices to organize, providing them with technical assistance on making the necessary surveys, organizing the communities for participation in the program, developing projects and getting them approved by SNAP.

But this was not enough. The Provincial offices were not well organized, in fact they did not even exist in several Provinces. The offices could not attract competent personnel as the salaries offered were low. The offices could not obtain enough funds to make it possible for the staff when it did exist, to go out to the towns, make the necessary surveys, help to promote the Plan with the communities and to enlist their help in organizing to assist with their own systems.

#### Development of the Incentive Plan (Plus) in Argentina

At this point the representatives of SNAP with the assistance of the sanitary engineer from the Pan American Health Organization made an analysis of the situation to determine the constraints on the program and to look for solutions to the problems involved.

One of the first things noted was the need for continuing contact between the SNAP office in Buenos Aires and the Provincial rural water supply offices (SPAR - Servicio Provincial para Agua Rural) to provide technical assistance and technical supervision. The SPAR office is strictly Provincial and comes under the regulations and control of the Province. The following diagram indicates the responsibilities for the rural water supply program at the various levels.



It was decided that the country should be divided into six SNAP Regions with three or four Provinces in each Region. Each Region was staffed with well qualified SNAP people to provide to the SPARs technical assistance in engineering, administration and accounting, and in social promotion. Continuing contact and supervision from the National level was to be maintained by SNAP with the SPAR's through this division of responsibility.

Next the slow rhythm of activities was analyzed to determine why progress was falling so far behind schedule. It was found that many people were working only part time on the project activities because the Provincial salaries were so low, also that it was difficult to get competent staff at those low salaries. Moreover, even with well qualified staff available,



there were many times when the staff could not visit the towns where they were supposed to be working, because there were no vehicles available, nor money enough to pay for per diem, gasoline or even bus fare. Hence, the staff was handicapped.

The Incentive Plan (sometimes called Plan Plus) was originated to overcome these difficulties. The main objective of the Plan is for SNAP to help the SPAR offices set realistic goals and then assist them to meet the goals by:

- a. Providing to the SPAR office an incentive payment to be divided among the employees who participate in working toward the goals, based on the percentage of the goals accomplished, and
- b. providing a fund for each SPAR office to help pay for per diem, transportation, even vehicles, so that the program is not held up because of lack of required mobility of the staff.

#### Methodology of the Incentive Plan

Guidelines were set specifying the activities for which annual goals were to be established by each Provincial SPAR office (see Annex A). Points were established for each activity, for instance eight points were allowed for the completion of each socio-economic survey with the data tabulated and analyzed. If a goal of five surveys was set and all five were completed during the year then the SPAR office would earn 40 points for that activity.

At the beginning of each year an agreement is worked out by SNAP representatives with each of the SPAR's specifying (a) the goals for each

of the activities and indicating the monetary value of the points to be earned for reaching or partially reaching the goals; (b) the financial support to be provided the SPAR by SNAP for per diem, etc.; (c) the amounts the SPAR is to contribute toward carrying out its rural water supply program; (d) the salary to be paid by SPAR to each of its employees working on the program; and (e) the amount of the incentive payment (contributed by SNAP) each SPAR employee is to receive. The method of distributing the incentive money is determined by each SPAR - sometimes it is based on a percentage of the SPAR salary, sometimes it is divided equally among the employees, sometimes an extra amount is allotted to those contributing the most to the activities with the highest point value; i.e., if a high value is set on project design, then those most directly connected with the design of the projects will receive a higher percentage of the incentive payment. The incentive payment has often been between 30 and 40% of the SPAR salary.

Every three months the SPAR office reports to SNAP in Buenos Aires on the progress actually achieved during the quarter. The report is evaluated, usually by the Regional personnel who recommend acceptance of the report or modifications based on their close contact with the progress in the Provinces for which they are responsible. Payment is made by SNAP to each SPAR based on the number of points earned. This money is then divided among the SPAR employees in accordance with the scale fixed in the SNAP/SPAR annual agreement.

Payment for financial support is made before each quarter so that the money will be available for use during the quarter and reported at the end of the quarter. This allows the SPAR employees to make their field trips when they need to do so and frees them from any constraints that may arise because Provincial funds are not available.

The guidelines have been modified two times from the original set issued in April 1969 (in December 1971 and January 1974). A fourth set of guidelines is in preparation for issuance in April 1975 (see Annex A for a comparison of the salient features of each of the four guidelines).<sup>1/</sup>

The incentive plan has been kept dynamic by frequent analysis of the results of the plan and of the needs of the rural water supply program. As might be expected, as a result, the incentive plan has been modified considerably from its original form, although the basic principles and methods have remained the same. New activity categories were added after experience with the first set of guidelines, to provide an incentive for getting reports in on time, also to provide an incentive for controlling the operation and maintenance of the water supply systems once they were built, establishing a comparatively high value for this activity. Next the assignment of point value was superseded by assigning a monetary value for the attainment of the goal established for the various activities. The activities were grouped so that instead of the original seven activities which were expanded to nine in the second set of guidelines, only four broad activities were considered in the third guidelines and more emphasis was placed on the preparation and approval of projects. At this time the size of a project was also taken into consideration so that approval of a project for 6,000 people would be worth pesos 25,000 as compared to pesos 7,000 for a project for less than 500 people.

The fourth guideline, now under discussion, has extended the size-of-system consideration to include the carrying out of the project,

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<sup>1/</sup> Copies of the four guidelines are attached to the original of this report.

as well as for project approval. Also additional payment is made for approval of projects which include treatment plants. Another activity has been added, namely to cover progress of construction in comparison with the planned progress. Moreover, it is proposed to evaluate and report progress only three times a year instead of four times as has been done in the past.

(This proposed change has been objected to (a) by the Provincial offices because it delays the payment for achievements accomplished and thus reduces the incentive for which the payment is being made; and (b) by some of the people in the SNAP office because the reporting will not coincide with the quarterly reporting required of them under the BID loan.)

Each set of guidelines contains samples of the forms to be used in reporting progress, also specific instructions on definition of terms, what is included in each activity, how the forms are to be completed and when each one is due. Each successive set of guidelines is more specific and more explicit.

#### Factors Influencing Progress of the National Rural Water Supply Program in Argentina

It is obvious that all of the accomplishments of SNAP since the inception of the rural water supply program in Argentina in 1964 are not attributable to the incentive plan. It is equally obvious that the incentive plan has contributed much to the program.

The incentive plan, as developed for the SNAP program in Argentina, is unique. A study of the accomplishments, with the assistance of this plan, provides an opportunity to consider the effectiveness of the plan under the ideal circumstances which existed from the formulation of the plan in late 1968 to the end of the first BID loan at the end of 1970 as well as during a period of less than ideal conditions including political changes

which have occurred since the signing of the second BID loan in October 1971. Progress on the various phases of the rural water supply program is shown year by year from 1966 through 1974 in Annex B.

Some of the factors influencing progress of the program are also indicated on that Annex. These factors are listed chronologically below:

- a. The goal for rural water supply established in 1961 as part of the Carta de Punta del Este served as the stimulus for the formation of a committee to study the rural water supply needs in Argentina and to recommend steps necessary to meet those needs. Out of these recommendations grew the Servicio Nacional de Agua Potable and Saneamiento Rural (SNAP) initiated by decree on December 2, 1964.
- b. The next factor was the signing on August 3, 1965 of the Inter-American Development Bank loan for 5 million to help finance a \$10 million program to provide water supply for 215 towns of 300 to 3,000 population.
- c. The division of the country into six Regions and the inauguration of the SNAP Regional services early in 1968 to support the Provincial offices (SPAR) with technical assistance on the engineering, administrative and accounting, and community development aspects of the rural water supply program provided a much-needed liaison between the national level SNAP office and the SPAR offices.
- d. The inception of the incentive plan near the end of

1968 did much to stimulate the rural water supply program in the provinces as detailed previously.

- e. Although the first BID loan was completed early in 1970, activities started under that loan continued throughout the year and the largest number of projects (119) was completed during that year.
- f. Due to the lack of international financing and the financial difficulties faced by most of the provinces in 1971, coupled with the fact that in many cases the provincial budgets were not approved until late in the year, progress on the rural water supply program slowed appreciably during 1971. Even the incentive plan was allowed to lapse for about a year as indicated on Annex B.
- g. The second BID loan was not signed until October 1971, nearly two years after the first loan was completed. Much of the rhythm attained during the last years of the first loan was lost. Even the reinstatement of the incentive plan in 1972 with the issuance of a revised set of guidelines did not provide the stimulus which was given by the original incentive plan. Part of this was probably due to the fact that the amount of funds provided through the incentive plan was not increased at the rate of inflation that prevailed at that time and the amount of money received under the plan by the individual decreased in proportion to his salary, so

the incentive to produce was not as high as during the period 1968 through 1970.

- h. Discontinuance of the liaison between SNAP and the SPAR's, supplied by the SNAP Regional staff, with the disbanding of this staff in March 1973 for all except one of the six Regions.
- i. The elections, change in government and resulting change in employees in the higher levels of both SNAP and the SPAR's has caused a disruption in the progress of the national rural water supply program.
- j. A further slowing effect has been caused by the scarcity of construction materials, particularly of plastic pipe, fittings, cement and reinforcing steel.

In spite of the constraints on progress caused by the factors listed in items (f) through (j), the morale of the staff of both SNAP and of the SPAR's visited was high. They were enthusiastic for the program and strong in praise of the benefits that accrued to the program through the use of the incentive plan.

#### Accomplishments of SNAP with Assistance of the Incentive Plan

With the stimulation of the incentive plan, the rural water supply program in Argentina has been transformed from an ad hoc approach under which some provinces built a few small water supply systems with public hydrants, into a national program under SNAP, planned and carried out by SPAR's throughout the country, providing water through house connections from systems which are operated and paid for by the people receiving the services.

Responsibility for the national program has been decentralized to the Provinces with coordination, programming on a country-wide basis, preparation of guidelines, training, administration of the incentive plan, partial financing for the program with national and international funds, and overall supervision of the program continuing at the national SNAP level.

Assistance in maintaining the all-important liaison between SNAP and the SPAR's for carrying out the national rural water supply program, including administration of the incentive plan, was provided from 1968 to March 1973 by the staff assigned on a Regional basis at the SNAP office in Buenos Aires. Both the SNAP office and the SPAR's are urging that this staff be brought up to full strength at once from the present staffing provided for only one of the six Regions.

The following accomplishment may be attributed directly to the incentive plan:

- a. Planning at both national and provincial level has been brought down to a realistic basis. From the point of view of the provincial offices, the planned goals must be attainable so they are kept realistic. From the point of view of the SNAP office, the goals must be high enough to meet the requirements of the overall national rural water supply plan and also challenging enough for the provincial staffs.
- b. Close cooperation has been developed between SNAP and the SPAR's bridging the gap between provincial autonomy and a national plan requiring the participation of all the provinces.



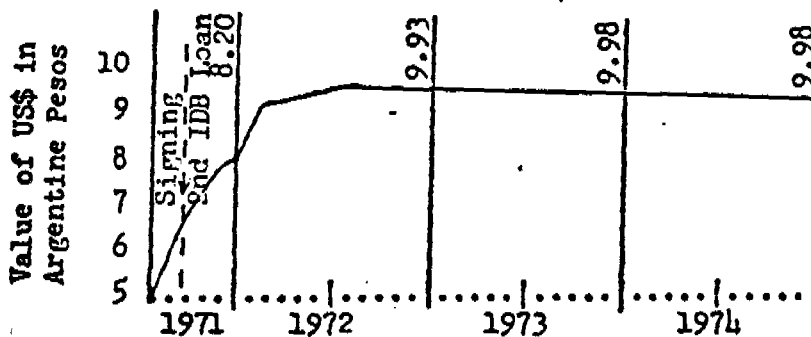
- c. Provincial offices have been organized with the technical guidance and assistance of the national SNAP office. The inducement provided by the incentive plan has made it possible to attract the staff needed to carry out the rural water supply programs. Additional training has been provided for this staff by special programs organized by SNAP. These programs have been for engineers, administrative and accounting personnel, promoters to work at the community level (part of the success of the rural water supply program is a result of the close liaison developed by the promoters with the communities in their provinces), operators and administrators for the individual systems.
- d. An esprit de corps has been developed among the staff at both the SNAP and provincial level. The majority of the personnel are enthusiastic about the program in spite of the various setbacks which have occurred during the past few years. This has been fostered by SNAP by including the provincial staff in planning sessions required for programing and for modifying the guidelines for the incentive plan. With the whole provincial office working toward the same goals, a spirit of cooperative effort has developed which has made it possible to meet those goals.
- e. In addition to providing for the payment of a bonus to the SPAR employees for meeting predetermined goals,

the incentive plan also provides a special support assistance fund to pay for travel allowances and to give the staff the mobility required to carry out the rural water supply program. This fund has made it possible for the SPAR staff to continue working in the field even when provincial funds are not available. This has removed one constraint which often delayed work because the staff could not go to the field as required for the timely carrying out of the program. See Annex C for the amount of money assigned by SNAP to the SPAR in the Province of Santa Fe to finance the cost of this special assistance support fund and of the fund for paying the bonuses for the SPAR employees in comparison with the cost of the contracts awarded for construction of water supply systems in that Province from 1969 through 1974.

- f. For a comparatively small additional investment through the incentive plan payments, the rural water supply program has been speeded up considerably, resulting not only in providing water supply services for more people in a shorter period of time than was being done before the incentive plan was initiated, but making it possible to do this at a considerable saving over what the systems would have cost later on due to inflation.

Budget for SNAP Program and Incentive Plan  
(Official rate - Argentina pesos 9.98 = US\$1 has varied from pesos 5.0 = US\$1 in 1971 to present value)

	<u>SNAP Budget</u>	<u>Incentive Plan Budget</u>	<u>Percent</u>
1973	38,919,000	3,000,000	8
1974	77,903,000	4,000,000	5
1975	144,977,000	4,870,000	3



Unfortunately the amount assigned for the incentive plan has not kept pace with the expansions of the program, nor with inflation so the incentive is not as attractive as it was during the first years of the plan.

g. The incentive plan has been kept dynamic by analyzing, periodically, progress of the various element of the program such as numbers of studies completed, projects prepared and constructed, thus pin-pointing constraints on the program and making it possible to adjust the

incentive payments to help speed up the element causing the delays. These analyses and adjustments have been reflected in the three revisions to the original set of guidelines for administering the incentive plan.

- h. The incentive plan assumes constant contact between the national level (SNAP) with the provincial level (SPAR) and the village level, first, through the preparation at the first of each year of the plan and various goals for the year, then through the quarterly reporting and checking of progress toward meeting those goals, all of which requires contact with activities at both the provincial and community levels.
- i. As the provincial program projected for each year is quite likely to be carried out as scheduled, it is possible to work with the communities sufficiently in advance of actual construction to assure full participation of the community without stimulating community interest too far ahead of the first indications of work on the project. This scheduling makes it possible to order materials well in advance and have them on the site, thus avoiding delays. Too often in the past community interest has been aroused, cooperation promised and then long delays of up to a year or more have caused the villagers to lose their original enthusiasm for the project.

There are a few drawbacks with the incentive plan. One is the possibility of creating jealousy among staff in other more or less similar agencies because of the bonus received by the staff working under the incentive plan. This was noted to a minor extent in Argentina, but was less of a problem when the SPAR office was isolated from other governmental offices, as was often the case.

No method has been devised to provide for delays beyond the control of the SPAR office, such as when a project cannot be completed because certain fittings or equipment cannot be obtained; or when project plans are submitted to the SNAP office and there is a long delay in their approval. These delays make it impossible for the SPAR office to meet goals which were based on logical expectations and so reduces the bonus received by the staff.

The incentive plan does take staff time to administer but the SNAP representatives said that the time required was relatively small and the results made it well worth the time invested.

Application of the Incentive Plan

Benefits of the Incentive Plan

The incentive plan, as used for the national rural water supply program in Argentina, may be adapted easily for use with other types of programs. It may provide a number of fringe benefits in addition to the obvious benefit of helping to speed up progress on an extensive program such as a country- or regional-wide program reaching many communities and people. The fringe benefits accrue from the fact that the incentive plan provides a method for:

- a. Assuring a realistic planning approach for a program by requiring goals that are challenging and also attainable.
- b. Offering salaries above the fixed salary scales of the agency thus attracting the qualified personnel needed to carry out a program.
- c. Motivating a staff to reach predetermined goals.
- d. Determining the constraints on the progress of a program by periodic evaluations and then offering higher incentives to overcome the bottlenecks which are causing the constraints.
- e. Speeding up progress on a multiphased program by coordinating work on the elements of the program to meet a fixed time schedule.
- f. Helping develop an esprit de corps within an organization working cooperatively toward common goals known to everyone.

- g. Bridging the gap between an agency at the central level responsible for planning an extensive program (such as a national program) and the implementing offices (autonomous or otherwise) responsible for carrying out the program, over which the central agency may have no administrative control, and providing liaison between the former and the latter.
- h. Taking advantage of the meeting of schedules to avoid the cost overruns resulting from delays which may double the cost of a project during periods of inflation.
- i. Keeping a program dynamic by periodic evaluations and revisions of the incentive plan guidelines as required to meet changing circumstances or conditions.

Procedures for Establishing an Incentive Plan

The following steps are suggested as a guide in establishing and developing an incentive plan:

- a. The program under consideration should be studied to ascertain the need for the plan. The list, included above, of possible benefits may help in justifying the use of an incentive plan for a certain program. There may be political or strong financial reasons for doing everything possible to make sure that a program is realistically scheduled and that the schedule is maintained. The Argentina program indicates that an investment of 8 to 10% of the capital cost of a program in an incentive plan is justified by the results

attained. This will probably vary from program to program and depend on many factors. The important criteria is that the incentive plan make it possible for the staff involved in the program to increase their base pay by at least 50%.

- b. Determination should be made of the components of the program for which goals are to be established. The components should be specific and have goals which are measurable. See Annex A for the components included in the SNAP program.
- c. The scheduling of each of the components must be developed and the relative importance for maintaining that schedule must be decided upon to assist in establishing the bonus to be paid for achieving the goal for each component. The bonus will also depend on the complexity of the component and the time involved in reaching the goal; i.e., it will require more work and time to design a water supply system, with a treatment plant, for a community of 7,000 people than it will to design a gravity system from a protected source to supply a village of 500 people. The bonus should be set accordingly.
- d. The bonus to be paid for reaching the goal for each component of the program must be established, based on the existing situation. As conditions change, it may be necessary to change the amount of the bonus to



speed up completion of some component which is holding back progress on the program. The amount of the bonus should be tied to a cost of living index or to some other index of inflation to assure that the bonus continues to provide an incentive for reaching the established goals.

- e. Clear, specific guidelines must be developed detailing the parameters for each component and for its goal, including the date for submitting each periodic report. It is suggested that reports be required quarterly to provide close supervision of progress and to make it possible for the staff to receive their bonuses at rather frequent intervals. A bonus received at six-month intervals loses much of its incentive. The guidelines should include specimen report forms. Both the guidelines and the forms should be reviewed with those who are to use them so that there is a clear understanding of the objectives, the procedures to be followed and the results to be expected. The guidelines should be evaluated periodically preferably at least once every two years, or as required, and should be changed as necessary to meet changing conditions.
- f. While procedures are being developed, it will also be necessary to assign and train the staff which will be responsible for handling the details of the incentive plan. At the central or national level this will

include not only the staff for handling the detailed paper work but also the staff required to supervise and maintain liaison with the implementing offices. It is highly desirable to group the implementing offices into zones or regions and to assign central level staff for each of the regions. (In Argentina the SNAP staff assigned for each of the six regions consisted of experts in technical matters, administration and operation, and in promotion and community participation.)

#### Implementation of the Incentive Plan

Once the above steps have been carried out, it will be possible to initiate the implementation of the incentive plan. This will require:

- a. The development of a long range plan for the program with careful scheduling of the annual goals required to meet the objectives of the long range plan.
- b. Based on the annual goals, preparation by the central office with the implementing office of an agreement specifying: (i) the annual goals for each of the implementing offices; (ii) the amount of the bonus to be paid for meeting these goals plus the amount of the administration assistance fund to be assigned; (iii) a tabulation of how the bonus funds are to be distributed among the staff of the implementing office; (iv) the funds to be assigned by the implementing office for financing the capital costs of the program. This annual

agreement should be developed and signed preferably before the year covered by the agreement has begun so that funds may be allocated and work may proceed from the beginning of the year. Delays in preparation and signing the agreement will make it impossible to reach the goals established in the agreement.

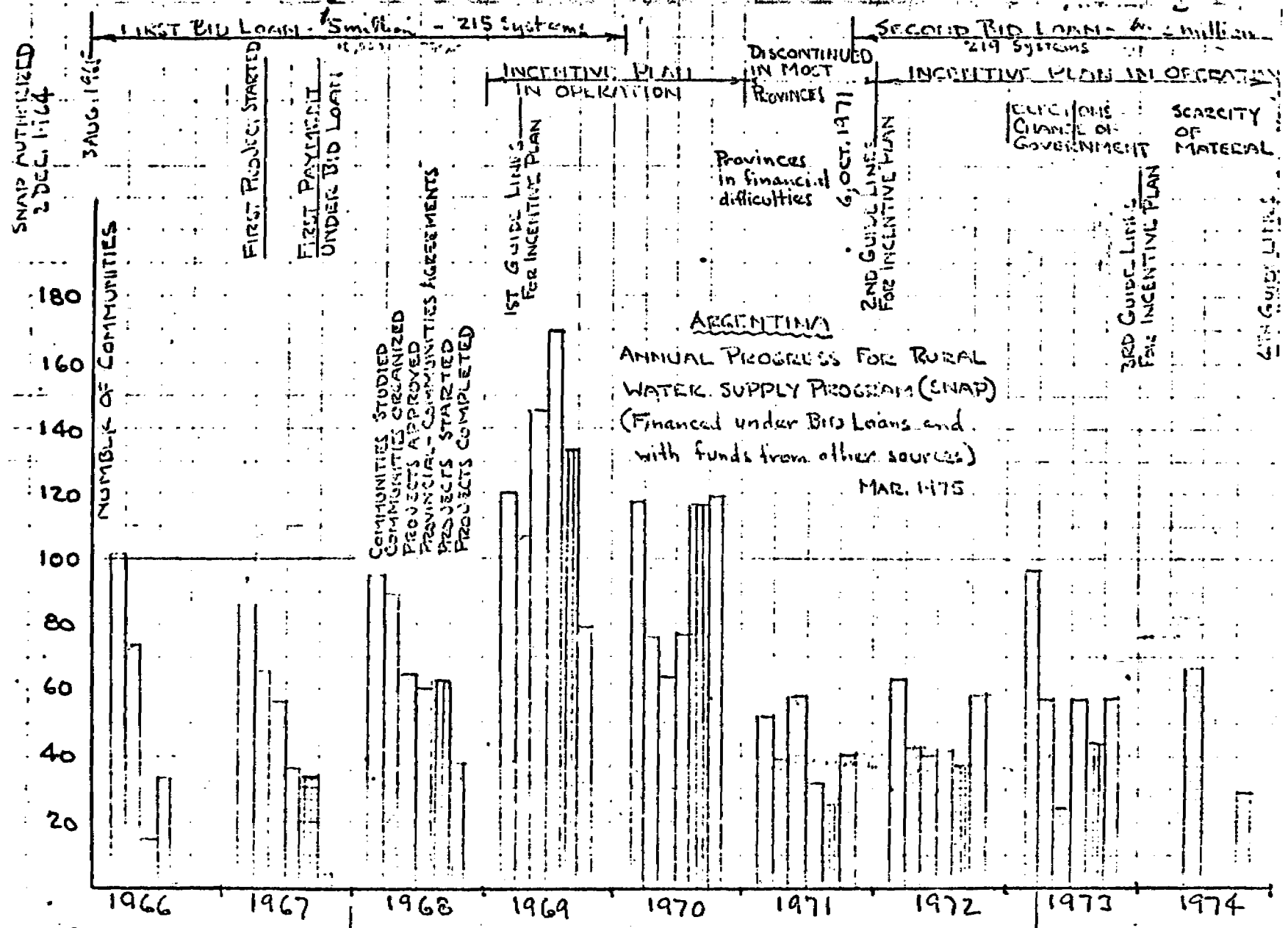
- c. Budgeting and allocation of the funds required to finance the incentive plan. The special administration fund should be allocated to a revolving fund in the implementing offices at the beginning of each funding period so that the money will be available for use during the period. It is important that the payment of bonuses be made promptly so that the money reaches the individuals involved expeditiously and the full incentive benefit of the bonus is attained.
- d. Assistance to the implementing offices in completing the necessary reporting forms, at least once, at the beginning of the use of the incentive plan so that the use of the procedures covered by the guidelines will be well understood.
- e. Prompt evaluation by the central office of the incentive plan reports, discussion of any differences and authorization of payments of the bonuses which have been earned. This evaluation will require constant liaison by central office staff (preferably using regional staff) with the implementing offices and monitoring of progress and

quality of performance in the field to make it possible for the central office staff to judge the validity of the reports.

- f. Analysis of the reports to ascertain overall progress and to determine constraints which may be delaying progress of the program. Determination of the incentives necessary to overcome the constraints and revision of the guidelines as required. Any changes which may appear necessary should be reviewed with staff of the implementing offices. This analysis of reports and revision of guidelines will help to keep the incentive plan dynamic and tuned to the needs of the program.

It is suggested that a consolidated annual report be prepared on the progress of the plan, highlighting the contribution of the incentive plan to the accomplishments during the year. This report should also reflect any factors beyond the control of the central agency and of the implementing offices, which may have made it impossible to meet the goals established at the beginning of the year. These might include shortages of material and supplies; delayed allocation of funds; political factors.

ANNEX B





S. P. A. R.  
 WATER SUPPLY SYSTEM DATA  
 PROVINCE OF SANTA FE  
 ARGENTINA

MAR. 1975

DATE	JUNE 1970	OCTOBER 1971	JUNE 1972	JUNE 1973	AUGUST 1974
TOWN	FRANCK, LAS COLONIAS	FIGHIERA, ROSARIO	SAN JORGE, SAN MARTIN	CORREA, INONDO	ACEBAL, ROSARIO
POPULATION	1078 215	2227 445	7981 1596	3312 662	2536 507
RATE OF EXCHANGE	Pesos 3.50	Pesos 4.00	Peso 9.85	Peso 9.85	Peso 9.98
COST OF SYSTEM	P 221,665 100%	P 434,222 100%	P 2,245,324 100%	P 1,037,213 100%	P 1,997,972 100%
BID LOAN	P 110,832 50%	P 217,111 50%	P 1,571,724 70%	P 518,607 50%	P 1,292,682 65%
NATIONAL	P 44,333 20%	P 86,244 20%	P 224,532 10%	P 207,443 20%	P 199,797 10%
PROVINCIAL	P 22,166 10%	P 43,422 10%	P 224,532 10%	P 103,721 10%	P 199,797 10%
COMMUNITY	P 44,333 20%	P 86,244 20%	P 224,532 10%	P 207,443 20%	P 299,615 15%
NO. OF CONNECTIONS	200 * 93%	335 * 75%	2134 100%	541 * 82%	510 * 100%
COST PER FAMILY	P 221.66	P 259.24	P 105.22	P 383.44	P 597.33
COST PER CAPITA					
PESOS	P 205.63	P 194.98	P 281.33	P 322.92	P 787.84
DOLLARS	\$ 58.75	\$ 48.74	\$ 28.56	\$ 32.78	\$ 78.94

\* Percentage of houses with connections  
 Assuming 5 people per house.

## APPENDIX E

### Scope of Work for Advisor on Establishment and Functioning of Regional Offices

#### 1. Background

USAID/Peru is providing US\$5 million for the construction of 420 small village (500 inhabitants) drinking water and sanitation systems in the sierra of Peru. In addition, they are providing US\$500,000 in grant funds for a technical cooperation package.

One of the principal concepts of this projects is the establishment of branch offices of the Dirección de Ingeniería Sanitaria (DIS) in six provinces to be covered by the project. Another, is that the work of these offices will be developed in close coordination and collaboration with local primary health care authorities.

#### 2. Objectives of the Advisor

The objectives of this advisor will be to ensure:

- 2.1 The development and installation of the management, technical and financial procedures for the six regional branch offices of DIS.
- 2.2 That the staffing of the regional offices is such that they can carry out system promotion and design, supervision of construction, long-term operation and maintenance back-up, and health education for the village drinking water and sanitation systems in their assigned region.
- 2.3 That training schemes are established for the development of semi-professional and technician level persons from the regional offices in the areas of promotion, design, construction, operation and maintenance, and health education philosophy as well as the procedures and standards of DIS.

#### 3. Proposed Output of the Advisor

The work of this advisor should result in:

- 3.1 The establishment of branch DIS offices that can: 1) carry out system promotion, design, supervision, and construction at the local level; 2) provide long-term operation and maintenance back-up to local operators; and 3) provide health and user education to those using the facilities built under this project.



- 3.2 The institutionalization of the procedures to operate the regional offices through the development of procedural/operation manuals.
- 3.3 Development of a long-term mechanism whereby the regional office staff will be trained in DID design, construction, operation and maintenance, and other procedures.
- 3.4 Establishment of a mechanism for reviewing and using the results of the special research projects.

#### 4. Proposed Work Plan for the Advisor

In order to attain the objectives of this mission, the following activities are proposed:

- 4.1 Once the DIS has established at least one regional office the advisor will be brought on board.
- 4.2 Using the first office as a pilot, the advisor will examine the establishment of five other decentralized branch offices of DIS that would be capable of carrying out the design of the drinking water and sanitation projects in their respective provinces with a minimum of supervision from the central office in Lima.
- 4.3 Working closely with the personnel assigned to each office, the advisor will then help them to establish the procedures for: a) designing and constructing new water and sanitation projects; b) ensuring that existing and new projects are being adequately operated and maintained; and c) carrying out DIS efforts in close cooperation and coordination with the regional health authorities.
- 4.4 The consultant, assisted by the human resource development expert, will also conduct a series of local training courses in DIS and branch office procedures for the initial group of office staff. The consultant will give special attention to the training of semi-professional technicians who will work under the general supervision of DIS professional staff to design local projects and supervise their construction as well as those who will oversee system operation and maintenance. With the assistance of the Human Resources Development Expert, future additions to the staff will be trained by DIS personnel following the guidelines and procedures developed by the consultant.

4.5 Once the first three offices are staffed and trained, the consultant will act as an administrative advisor in the establishment of the additional offices and in the development of strong and close linkages between this project and local primary health care (PHC) activities.

4.6 During the second half of his mission the consultant will also advise on and stimulate the development of the special studies called for in the Project Paper or as modified by mutual agreement between USAID and DIS.

In order to achieve the above mentioned activities it is expected that the functions of the consultant will be advisory rather than administrative in nature. It is expected that he will be (1) a catalyst for the process of establishing and placing in operation the proposed local branch offices of DIS, (2) a coordinator and supervisor of the TA package, and (3) a director of the human resources development effort as well as an instructor in various courses.

#### 5. Relationship

The consultant will be stationed at DIS which will assign him full time four-wheel transportation and cover his per diem for field visits (from grant funds). He will be expected to travel to and remain at the local office for extended periods of one or two weeks at a time.

The consultant's work plan will be reviewed and approved monthly by both AID and DIS.

#### 6. Characteristics of Proposed Consultant

The consultant for this mission should be:

- fluent in spoken and written Spanish and English and
- experienced in the management of village water programs in Latin America

In addition, the consultant should be knowledgeable in conducting training courses on the semi-professional and technician level.

#### 7. Proposed Timing and Mission

This consultant should be available to start work once the first branch office is established.

## APPENDIX F

### Suggested Additions to Wellin Study to Cover Excreta Disposal

1. The suggested additions to the Wellin Study to cover in more detail the excreta disposal situation in Ica are listed below:
  - 1.1 If there is a latrine, how far is it from the house? What type is it? (squat plate with water-seal siphon; riser; type of protective shelter--bamboo, wood, adobe, concrete block, etc.)
  - 1.2 Is latrine clean? What is used after defecation--paper, leaves, corn husks, etc.?
  - 1.3 What are the feelings or beliefs of the people about excreta disposal, privacy, use of squat type or riser type latrines, with or without water seal?
  - 1.4 Have there been any health education programs either at the health post/center or school about the need for and use of the latrines?
  - 1.5 If the household does not have a latrine, would the householder be willing to build one if the slab or whatever type that is provided by the project is furnished and advice is given on location, construction of the pit, and protective shelter (assuming that the shelter is made of local material)?
2. Possible additions concerning the water supply situation.
  - 2.1 Did the householder participate in any way in the planning for the water supply system? In the construction? In establishing the water rates? In the operation and maintenance of the system?
  - 2.2 Before the system was built, was the householder advised of his responsibility for participating in the construction and of the amount he would have to pay as a water charge (monthly)?
  - 2.3 What promotion was carried out before the system was installed? By whom? Also what health education program was carried out and by whom?
  - 2.4 During the past three months, and past year, how many times has a promoter, health educator, or other person from either DIS or MOH visited the town and talked with the people about the use and maintenance of their supply system?

2.5 Are there any women on the local water supply and sanitation junta?