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**WATER AND SANITATION
FOR HEALTH PROJECT**



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EVALUATION OF THE SEDRI/IEOS RURAL WATER AND SANITATION PROGRAM IN ECUADOR

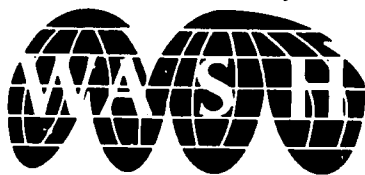
WASH FIELD REPORT NO. 127

SEPTEMBER 1984

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

**Prepared For:
The USAID Mission To The Republic Of Ecuador
Under Order Of Technical Direction No. 178**

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Georgia Institute of Techno-
logy - Engineering Experi-
ment Station.

20 September 1984

Orlando Llenza
USAID Mission
Quito Ecuador

Attention: Dr. Ken Farr

Dear Mr. Llenza:

On behalf of the WASH Project I am pleased to provide
you with ten copies of a report on the evaluation of the
SEDRI/IEOS rural water and sanitation program.

This is the final report by David Donaldson and Oscar
Larrea and is based on their trip to Ecuador from March
26 to April 14, 1984.

This assistance is the result of a request by the
Mission on 6 February, 1984. The work was undertaken by
the WASH Project on February 7, 1984 by means of Order
of Technical Direction No. 178, 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,

David Donaldson
Acting Director
WASH Project

cc: Dr. John H. Austin
S&T/H/WS

DBW:kk

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Prepared for the USAID Mission to the Republic of Ecuador
under Order of Technical Direction No. 178

Prepared

by

David Donaldson
Oscar Larrea

September 1984

Water and Sanitation for Health Project
Contract No. AID/DSPE-C-0080, Project No. 931-1176
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U.S. Agency for International Development
Washington, DC 20523

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ABBREVIATIONS

IRHDS	Intergrated Rural Health Delivery System
IRD	Integrated Rural Development
GOE	Government of Ecuador
NHC	National Health Council
MPH	Ministry of Public Health
IEOS	Ecuatrian Institute of Sanitary Works
SEDRI	Secretariat of Intergrated Rural Development
USAID	United States Agency for International Development
SDA	Special Development Assistance
RWSS	Rural water supply and sanitation
PP	Project Paper
JRH	Junta de Recursos Hidraulicos (Hydraulic Resources Junta)
UPOCAM	Union Provincial de Organizaciones Campesinas Agropecuarias de Manabi (Provincial Union of Agricultural Workers of Manabi)

EXECUTIVE SUMMARY

In late 1981 the Government of Ecuador and USAID signed a loan/grant agreement to develop an Integrated Rural Health Delivery System (IRHDS) Project. The Project's purpose was to coordinate the various primary health care inputs into a model that would be implemented in three integrated rural development (IRD) areas. It was expected that the experience with the model would allow the government to replicate the IRHDS concept on a nationwide basis. A 1982 amendment expanded the funding for and the number of provinces to be covered by the water and sanitation efforts.

The Project's strategy was to be one of working with existing agencies to strengthen their local and national capabilities through a learn-by-doing technique. Various agencies would be coordinated by the Secretariat of Integrated Rural Development (SEDRI) and the provision of adequate quantities of safe water and appropriate basic sanitation measures would be the responsibility of the Ecuadorian Institute of Sanitary Works (IEOS).

In the area of safe water and better sanitation the Project was to work with IEOS to:

- Develop RWSS coordination units at the national and provincial levels
- Train all levels of RWSS staff
- Expand the use of paraprofessionals in IEOS activities
- Develop mobile maintenance units
- Investigate low-cost simplified devices and approaches that could be used to reduce system costs.

The efforts of the Project were to be focused through three major areas: 1) institutional strengthening of IEOS at both the national and provincial level; 2) operational research into low-cost simplified water and sanitation devices and/or approaches; and, 3) field activities to develop a replicable model that would allow IEOS to work with the communities needing safe water systems and improved sanitation services and to identify design, construct and operate them on a long-term basis.

In April '84 a team of WASH experts were called in to assist USAID/Ecuador to undertake a midproject review. They were asked to: 1) identify progress toward attainment of Project objectives; 2) identify and evaluate problem areas or constraints; 3) assess how such information could be used to help overcome problems; and, 4) evaluate the overall development impact of the Project.

After discussions with the Mission and SEDRI central office and a series of field visits the team of two Spanish speaking sanitary engineers examined and developed "conclusions" concerning the following areas:

- Outputs in terms of water systems and latrines
- Strengthening of institutional systems
- Institutional arrangements
- Community participation
- User education activities.
- Commodity inputs

Chapter 2 presents the results of the Project efforts to build drinking water systems and latrines. After describing the work to be done in the six provinces (Chiniborago, Cotopaji, Manbi, Esmeraldos, Los Rios and Tungurahua) the team shows that while water systems and latrine construction are behind schedule, the development of the institutional aspects are even further behind. As its conclusion the team called for redefining Project goals in light of current programs, for developing clearly defined areas of responsibility and, for developing job descriptions for those working on the Project to reflect the desired institutional arrangements.

Chapter 3 discusses the Project's inputs toward institutional strengthening of the national and provincial level offices. The team sought to find: 1) an increased ability of IEOS to implement RWSS projects as the result of the Project; 2) any cost reductions through use of low-cost simplified technologies; 3) if the RWSS coordination units were effectively coordinating IEOS RWSS activities; 4) what had been the role of the AID sanitary engineer in the functioning of the unit and the development of the model; 5) what were the results of the training that had been carried out to date; 6) what efforts had been expanded to train paraprofessionals; and 7) what had been done about establishing the proposed rural maintenance units. Following the discussion of each of the above points the team developed a short conclusion that summarizes the major results to date.

Chapter 4 discusses the varied results that have been obtained from the different financing schemes that have been tried by the Project (SEDRI/IEOS/AID, IEOS/AID and SDA/IEOS). The team concludes that more work needs to be done in this area as none of the schemes has resulted in a system construction rate that will allow the Project to meet its construction goals. The team takes special note of the complex financial/institutional arrangements in Jipijapa and of the fact that in two years only 18 wells, 14 handpumps and 500 latrines have been delivered to the users.

In chapter 5 the team reports on the aspects of community participation and user education. After examining the use of these elements in the planning, financing, operation/maintenance, and administration phases of the Project, the team looked at problem areas and suggestions for improvement.

Chapter 6 discusses the use of the various trucks and pickups that were provided to IEOS to help improve that agency's supervisory and local maintenance capabilities. It discusses the need for a policy decision on how IEOS will backup the local junta in the event that it decides not to place in operation the proposed mobile maintenance vans.

In chapter 7 the team presents the conclusion that the Project is at a critical junction. About half its time is gone and it still has much to do. The team concludes that to do this the AID sanitary engineer should take the lead in having IEOS refocus its efforts from having system construction being

primary focus to that of institutionalizing the concepts, procedures and criteria that have been found to reduce the time and costs for bringing drinking water and basic sanitation measures to small villages and semi-dispersed populations. The team presents 26 recommendations in five areas which are focused toward increasing community participation, expanding the role of paraprofessionals and lowering program costs. These recommendations cover such topics as:

- A mid-project meeting
- Long-term operation and maintenance
- Commodities
- Water quality
- Institutional aspects
- Operational research
- Field activities
 - Water systems
 - Latrines
 - Maintenance

- Community participation
 - Continuous promotion
 - System coverage
 - User education



Ecuador seeks to provide safe water and adequate sanitation to its rural population by improving its integrated rural health delivery system.

Chapter 1

BACKGROUND

1.1 Intergrated Rural Health Delivery System

On September 27, 1981 the Government of Ecuador (GOE) and USAID signed a Loan and Grant Agreement to develop an Integrated Rural Health Delivery System (IRHDS) Project. The Project's purpose was to coordinate the various primary health care inputs into a model that would be implemented in three integrated rural development (IRD) areas. It was expected that the experience with the model would then be used to replicate the IRHDS concept on a nationwide basis.

Specifically, the Project would assist the GOE to develop a system for:

- Improving existing health services delivery and providing new, integrated health services in high priority rural areas.
- Improving the utilization of lower cost primary health care services.
- Rationalizing health service delivery by coordinating efforts of health services institutions within geographic areas.
- Facilitating extension of rural water and sanitation services through the use of appropriate low cost technologies.
- Incorporating nutrition concerns in health program design and implementation.
- Decentralizing decision-making responsibility for health programs and facilitating community participation in the decision-making and implementation process.

The Project's strategy would be one of supporting the development of the IRHDS concept by:

- Strengthening the ability of GOE institutions to plan, manage, support and then replicate the resulting approach at the area, provincial and national level; and,
- Carrying on primary health care activities such as water supply/sanitation and nutrition improvement in the IRD projects of Quimiag-Penipe, Salcedo and Jipijapa so that GOE institutions would "learn by doing" (see Appendix A for detailed Project Description).

The following GOE institutions were to serve as the implementing agencies for the Project: National Health Council (NHC), Ministry of Public Health (MOH), Ecuadorian Institute of Sanitary Works (IEOS) and the Secretariat of Integrated Rural Development (SEDRI).

The major activities (i.e., institution-building, practical research, field demonstration activities) and their supplements (training, studies, water

systems, etc.), as well as the funding for each one is shown on Table 1.1. From this it can be seen that it was expected that as the result of strengthening the operational agencies, investigating low-cost/simplified technologies and approaches, and carrying out field demonstration activities in a limited number of Integrated Rural Development (IRD) Areas, the GOE would be able to develop a replicable model for a coordinated approach to rural health activities.

On September 29, 1982, an amendment was signed to the basic agreement expanding Project funding in the water supply and sanitation area. The additional funding allowed IEOS: 1) to expand its institutional building activities to three additional provinces; 2) to build ten water systems in the Jipijapa IRD project (as opposed to wells with handpumps); and, 3) to implement additional water and sanitation projects outside of the IRD areas in the six provinces. The amendment added \$2.6 million to the project. (See Table 1.2 for details and funding.)

Table 1.1
Project Financial Plan (Phase I)*
(1000 of US \$)
(1981 to 1986)

Component	A.I.D.		Ecuador	Total
	Loan	Grant		
A. <u>Institution Building Activities</u>	<u>1,575</u>	<u>475</u>	<u>2,100</u>	<u>4,150</u>
1. National Health Council	<u>100</u>	<u>140</u>	<u>160</u>	<u>400</u>
a. Studies	50	100	100	250
b. Seminars and Workshops	30	40	30	100
c. NHC Support	20	-	30	50
2. Ministry of Health	<u>525</u>	<u>135</u>	<u>540</u>	<u>1,200</u>
a. Area Level	330	100	350	780
(1) Implementation of the Model	(185)	(80)	(245)	(510)
(2) Training	(145)	(20)	(105)	(270)
b. Provincial Level	50	35	50	135

* From USAID/Ecuador; Project Loan and Grant Agreement for Integrated Rural Health Delivery System, 9/81.

Component	A.I.D.		Ecuador	Total
	Loan	Grant		
3. Ecuadorean Institute of Sanitary Works	<u>950</u>	<u>200</u>	<u>1,400</u>	<u>2,550</u>
a. National Level Activities -Rural Water Supply and Coordination Unit -Training	610	125	710	1,445
b. Provincial Level Activities -Paraprofessional Personnel -Maintenance Units -Logistical Support	340	75	690	1,105
B. <u>Coordination, Investigation, and Technology Promotion Activities</u>	<u>255</u>	<u>205</u>	<u>230</u>	<u>690</u>
1. Integrated Rural Development Secretariat	255	175	200	600
a. Food Policy Studies	100	175	125	400
b. Promotion of Low Cost Technologies	125	-	75	200
2. Ministry of Health	30	30	30	90
a. Bio-medical, Social and Nutritional Studies	15	15	15	45
b. Operational Research	15	15	15	45
C. <u>Field Demonstration Activities</u>	<u>3,570</u>	<u>-</u>	<u>4,130</u>	<u>7,700</u>
1. Primary Health Care (PHC)	<u>870</u>	<u>-</u>	<u>630</u>	<u>1,500</u>
a. Community Based Primary Health Care Activities	180	-	120	300
(1) Health Promoters	(120)	-	(100)	(220)
(2) Other Community Based PHC Activities	(60)	-	(20)	(80)
b. Priority Primary Health Care Programs	145	-	370	515
c. Health Infrastructure	545	-	370	915
2. Water Supply and Sanitation	<u>2,500</u>	<u>-</u>	<u>3,300</u>	<u>5,800</u>
a. Rural Water Supply System	1,170	-	1,170	2,340
b. Shallow Wells with Handpumps	680	-	680	1,360
c. Excreta Disposal	650	-	1,450	2,100

Component	A.I.D.		Ecuador	Total
	Loan	Grant		
3. Nutrition Activities	<u>200</u>	<u>-</u>	<u>200</u>	<u>400</u>
a. MOH Maternal and Child Feeding Program Support	50	-	35	85
b. Pilot Nutrition Field Activities	150	-	165	315
D. <u>Contingencies</u>	<u>600</u>	<u>70</u>	<u>540</u>	<u>1,210</u>
TOTAL	<u>6,000</u>	<u>750</u>	<u>7,000</u>	<u>13,750</u>

1.2 Rural Water and Sanitation Component

A major element in the GOE's efforts to improve rural health delivery is the improvement of water supply and sanitation coverage. The IRHDS Project seeks to work with IEOS to integrate a series of practical modifications into current structures by using the following innovative concepts:

- Development of Rural Water Supply and Sanitation Coordination Units at the national and provincial levels.
- Training of all levels of personnel through long and short term efforts using seminars, workshops and continuing education techniques.
- Expanded use of paraprofessionals for design, promotion, inspection and supervision of systems.
- Development of mobile maintenance units.
- Investigation of low-cost simplified devices and approaches which can be used to reduce system costs.

The efforts of the Project were to be focused through three major areas: 1) the institutional strengthening of IEOS at both the national and provincial levels; 2) operational research in the area of low-cost/simplified water and sanitation devices and/or approaches; and, 3) field activities to develop a replicable model.

Both the institutional strengthening and the field activities programmed under the Project have as their primary purpose to create within IEOS the capacity to design, implement and maintain, over the long-term, simple low-cost rural water and sanitation systems that will serve the population range of approximately 500 inhabitants or fewer through piped systems, handpumps, and latrines.

Table 1.2
 Financial Plan for Additional Project Activities
 (1000 of US \$)
 (1982 to 1986)

	A.I.D. Loan	Grant	Host Country	Total
I. IEOS Provincial Level Institution-Building	240		56	296
II. Water and Sanitation Field Activities in Six Provinces	795		979	1,774
III. Water and Sanitation Field Activities in the Jipijapa IRD Project	200		200	400
IV. PASA Extension	_____	130	_____	130
TOTAL	1,135	130	1,235	2,600

1.3 Project Evaluation

In February of 1984, WASH was requested by AID/Ecuador to participate in a midproject review. Due to other commitments, the WASH team leader was not able to travel to Ecuador until after most of the evaluators for the other components of the project had departed. He was therefore not able to benefit from their insights as no draft reports had been left with the Mission by the time of his departure.

The WASH team was composed of two experienced rural water/sanitation engineers. The team leader was the WASH Associate Director for Engineering and Technology and the second team member was an Ecuadorean Engineer with extensive international experience in the field of rural water and sanitation systems.

After meeting with the Mission Health Officer, the water and sanitation evaluation team proceeded with its investigations both in Quito and in the field areas of the Project (i.e., the IRD areas of Quimiag-Penipe, Salcedo and Jipijapa as well as in Tungurahua, Manabi, and Esmeraldas provinces.)

The evaluation examined the four areas called for in Article 6.1 of the Project Loan and Grant Agreement as follows:

- a. Evaluation of progress toward attainment of the objectives of the Project;

- b. Identification and evaluation of problem areas or constraints which may inhibit the attainment of the objectives;
- c. Assessment of how such information may be used to help overcome such problems; and
- d. Evaluation, to the degree feasible, of the overall development impact of the project.

The team's work was guided by the outline that was developed by WASH from AID/Ecuador's cable Quito 1218 (See Appendix B) which called for them to evaluate the following specific items:

- Commodity inputs
- Strengthening of institutional systems
- Outputs in terms of water systems and latrines
- Community participation
- Institutional arrangements
- User education activities

The team's report will first present its findings and conclusions in each of the six areas mentioned above. And, then it will present the recommendations grouped into the following four areas:

- Refining the proposed IRD model as applied to rural water/sanitation activities
- Institutional strengthening activities
- Operational research
- Field activities

1.4 Team's Contacts

After examining the Project Paper (PP), its 1982 amendment, the various project agreements between SEDRI, IEOS, JRH, and UPOCAM as well as holding conversations in the AID Mission, the team visited the SEDRI, IEOS and Inter-American Development Bank Office in Quito.

Following this the team visited five IEOS Provincial Offices, 3 IRD offices, the JRH offices and 11 field sites.

On their return to Quito the team held further discussions with IEOS and AID prior to developing this final report.

Appendix D shows the various officials that were visited and Appendix E shows the various documents that were consulted.

Throughout the course of their work the team attempted unsuccessfully to contact a local consultant that had been contracted by SEDRI to participate in the evaluation. In spite of all efforts to have him contact the team, it was not possible to have his input during the three-week mission.

Chapter 2

WATER SYSTEM AND LATRINE CONSTRUCTION

2.1 General

The purpose of the Project is to improve health conditions in those rural areas that have scarce resources. This was to be done by developing a model for the delivery of basic health services that could be applied on a national scale. Among others, the components of the model would include the provision of drinking water and basic sanitation approaches that make use of appropriate and low-cost technologies.

The model is to be developed in the provinces of Chimborazo, Cotopaxi, Manabi, Esmeraldas, Los Rios and Tungurahua. In the first three provinces the Project explored two different financing mechanisms for bringing water and sanitation services to the small villages and rural areas of Ecuador. In the first mechanism, IEOS worked in coordination with the executing unit of the Integrated Rural Development Program of Quimiag-Penipe and Salcedo, and with the Board of Hydraulic Resources in Jipijapa. In the second mechanism, USAID/Ecuador provided financing directly to IEOS for construction of a limited number of water and sanitation systems.

In the provinces of Esmeraldas, Los Rios and Tungurahua, USAID/Ecuador only used the second mechanism described above. That is, they provided Project financing directly to IEOS so that organization could investigate, design, construct and assist the community to operate and maintain rural drinking water and sanitation systems.

The provision of drinking water to the rural population in the IRD and IEOS areas mentioned are through three different types of systems:

- Gravity fed
- Deep wells with mechanical pumping
- Shallow wells with handpumps

The first type of system will consist of a protected spring and capture works, a transmission line to a storage tank, disinfection using calcium hypochloride and a distribution network to house connections with meters. For the second type, IEOS has drilled 6 inch (150mm) wells with depths from 32 to 36 meters in which they will install diesel or electrically driven submersible pumps. The water will be disinfected with calcium hypochloride and the system will consist of a storage tank and distribution network to house connections with meters. The last type system will consist of shallow hand-dug or drilled wells and use locally manufactured AID type handpumps.

The excreta disposal measures will consist of a dry latrine or pour-flush toilet at each house that receives a house connection. The basic unit usually consists of a locally manufactured or Colombia-type pour-flush toilet, a locally constructed structure with a zinc or asbestos-cement roof and a wood door.



Typical Rural Village on the Coast



Typical Rural Village in the Mountains

Table 2.1
GRAVITY FED AND MECHANICALLY PUMPED DRINKING WATER SYSTEMS
MARCH 1984

PROVINCE AND AREA PROJECT	PROJECTS PLANNED AND UNDER CONSTRUCTION	PROJECTS COMPLETED	TOTAL SYSTEMS COMPLETE
Chimborazo: AID/IRD/IEOS AID/IEOS	14 4	4 3	18 7
Cotopaxi: AID/IRD/IEOS AID/IEOS	9 5	1 1	10 6
Manabí: AID/IRD/IEOS AID/IEOS	4 2	- -	4 2
Esmeraldas: AID/IEOS	5	-	5
Los Ríos: AID/IEOS	2	-	2
Tungurahua: AID/IEOS	3	1	4
Sub-Total: AID/IRD/IEOS AID/IEOS	27 21	5 5	32 26
TOTAL	48	10	58

Note: Some systems are so called Regional and serve groups of small communities from the same source, sometimes up to 18 each.

2.2 Project Inputs

Based on field observations in the provinces visited and from information gathered during meetings and interviews, the team was able to develop the information concerning construction rates and progress as shown on Table 2.1 and Figures 2.1, 2.2, 2.3 and 2.4.

The general operative plan of the Project calls for the construction of 58 drinking water systems and for the development of 870 dug wells and the installation of an equal number of handpumps. (The plan calls for 600 wells with pumps in the Province of Manabi, for 70 in the other AID/IRD/IEOS areas, and for 200 in the AID/IEOS areas.) The Project is also considering the installation of approximately 5,600 latrines and pour-flush units in the AID/IRD/IEOS areas and 1,400 of these devices in the AID/IEOS areas.

Assuming that the last column of Table 2.1 represents the total of the systems that should be constructed by the end of the Project (31 December, 1986), the team prepared two graphs as examples that show the state of completed vs programmed systems for Chimborazo and Cotopaxi provinces (see Figures 2.1 and 2.2). In examining these figures, it should be noted that they are based on the number of systems, not the population served. If the latter were used, the percentage completed would be higher as several of the systems are regional ones that include a number of communities under one name. Nevertheless, it is evident that corrective action is necessary and the Project should seek mechanisms that would allow the acceleration of the construction process.

The types of systems to be built under the Project are outlined in SEDRI/IEOS/AID and IEOS/AID agreements. Chimborazo and Tungurahua provinces are 100% gravity-fed systems, whereas in Cotopaxi only 87.5% are of this type. The five systems being built in Esmeraldas all have mechanical pumping, while in Manabi 30% are gravity systems and the rest will use mechanical pumping. In the province of Los Rios, the Project will provide two drilled wells with mechanical pumps.

In developing the different phases of the Project, IEOS is using its usual community participation philosophy and techniques (i.e., IEOS promoters help to organize a construction junta that oversees the community's contribution of materials, funds and labor. After construction the promoters continue to work with the community as they operate and maintain the systems).

2.2.1 Gravity/Mechanical Pump Water System

In all of the gravity and mechanical pumping systems the water flow will be measured at each connection using a TAVIRA water meter that will be housed in a box made of wood or block. To ensure the public health aspect of the Project each user has constructed a double basin wash stand in which one side is used for storing water that will be used to flush the pour-flush toilet.

The procedure being used with each community is as follows: Prior to starting work the community signs a contract with IEOS and then organizes the Administrative Junta which is made up of a President, Treasurer, two Vice-Presidents and a Secretary.

Figure 2.1

Drinking Water Systems In AID/IRD/IEOS and AID/IEOS Areas

Province: Chimborazo

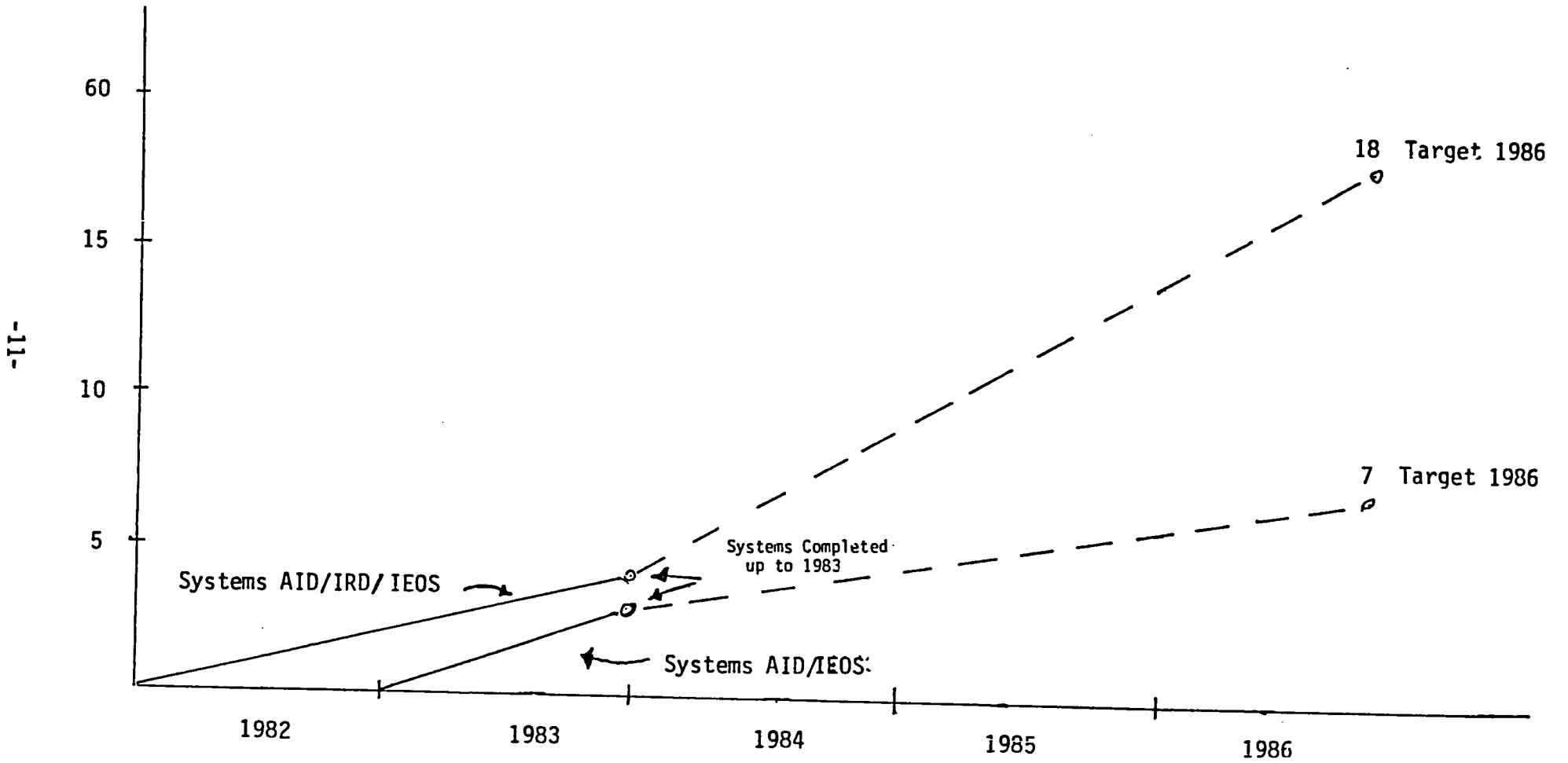
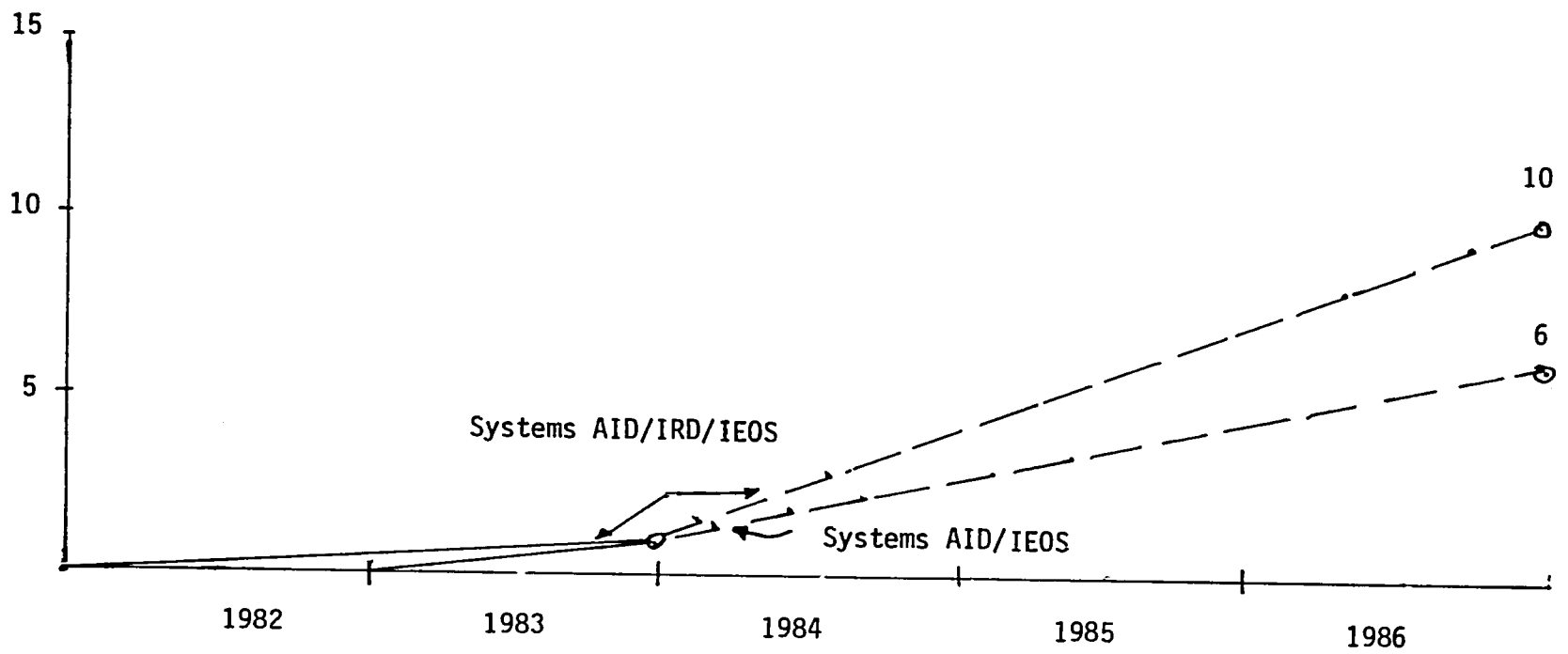


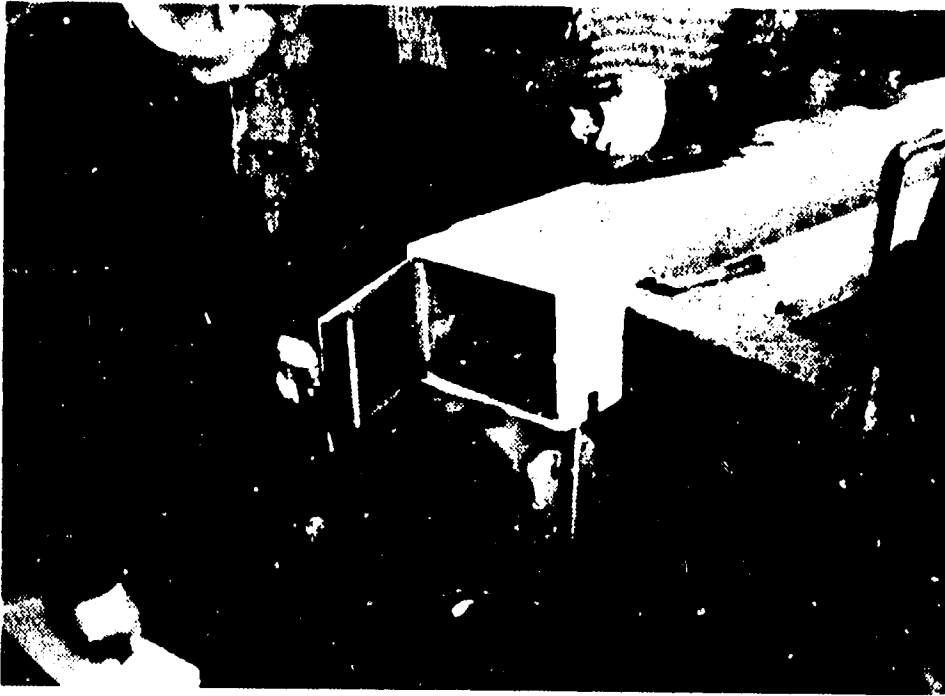
Figure 2.2

Drinking Water Systems In AID/IRD/IEOS and AID/IEOS Areas

Province: Cotopaxi

-12-





Typical house
connection with
meter and box

Water Supply
from Rainwater
Catchment



Condition of
Drinking Water in
Rainwater Storage
Barrel



The junta and the IEOS promoter keep the accounts on the number of days of work ("jornales") that each family contributes in order to determine who has earned the right to receive a "free" house connection. Those families who have not completed the required number of "jornales," or who have not participated in the "mingos" (voluntary community labor), will be required to pay in cash twice the value of the "jornales" they lack at the time they request the connection.

A water rate is established for each system based on its construction and operating costs and each house connection is metered. The user's water bill is developed by having the meter read by the system operator who turns the water consumption figure over to the junta's treasurer who in turn collects the funds from each family. The junta maintains a savings account in a local bank which is reviewed by the IEOS promoter/supervisor.

While these mechanisms, if they are rigidly applied and/or accepted by the community, have resulted in the system having sufficient funds for maintenance and administration, they have not resulted in complete coverage of all the potential users in the village being served by the Project. The team feels that the number of houses without a house connection is too high.

2.2.2 Handpumps and Wells

To install handpumps in the Jipijapa area the JRH, the executing agency for the project in Jipijapa, subcontracted the construction of 100 wells with handpumps to the Union Provincial de Organizaciones Campesinas Agropecuarias de Manabi (UPOCAM). The contract called for the completion of 8 or 9 wells per month for the first year. It is estimated that each well will cost about 21,000 sucres.* To date, only 14 wells have been drilled and handpumps installed. There are two additional IEOS constructed wells in Chimborazo and two more in Manabi. The type of well being built is a lined dug or drilled well that has a sanitary top and is provided with a handpump.

2.2.3 Latrines

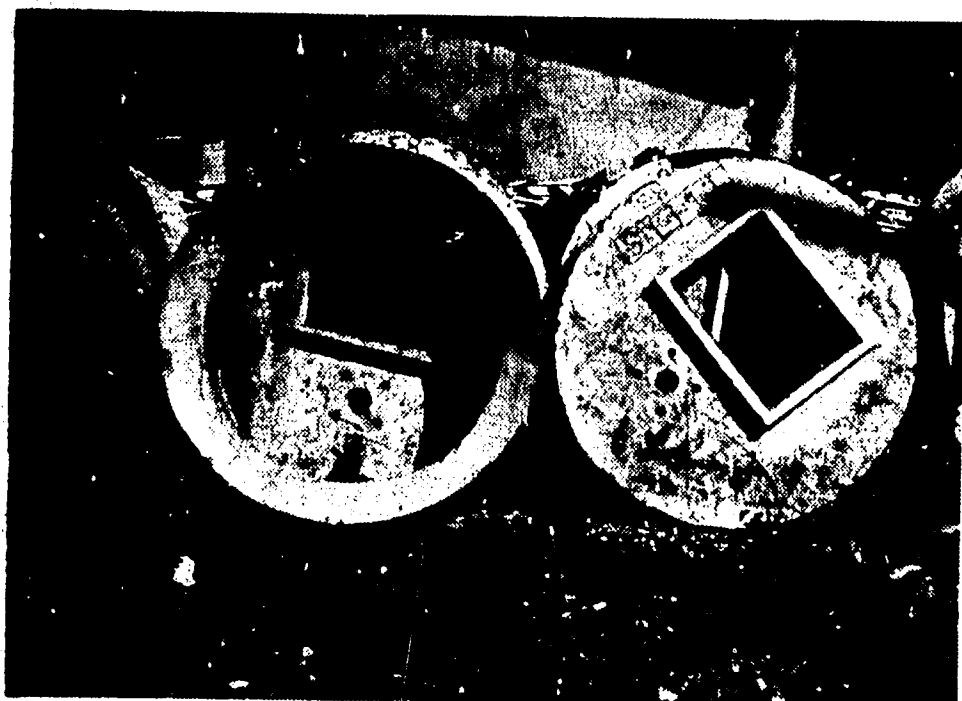
The construction of the latrines and pour-flush toilets is being done in parallel with the installation of the water service. In addition to the motivating work being done by the promoter, the provincial IEOS offices use various mechanisms to obtain the acceptance and participation of the community for system construction as well as for the use and maintenance of the latrines and pour-flush units. The total number of units that have been installed to date is only 1,900. This is only 30% of the total. Of this number, 500 have been installed in the SEDRI/IEOS/AID area of Manabi by means of the UPOCAM contract.

In the Sierra provinces, local production of a handmade concrete pour-flush unit has been established. The cost of these units varies between 440 and 500 sucres each. This is much cheaper than the ceramic Colombian-made unit which

*62.11 sucres = \$1 US.



Typical handpump
installation in
Jipijapa



Standard covers
for dug wells



Locally made
concrete pour-flush
latrine.
(Note: This unit
is designed to have
a flush tank added
at a later date.)



Imported ceramic fixtures
installed in a shower/
bathroom combination

is widely used throughout the country. A problem being experienced is that the finish of the locally made unit is not as good as that of the ceramic unit, which could result in sanitary and/or odor problems.

The latrine structure is generally a block house with an asbestos cement or zinc roof and a wooden door.

In the sites that were visited where the water system was completed, the team observed a number of latrine sites that were not finished and a number of completed units that were not being used. That latter problem was often that the latrine was located at a distance from and/or downhill from the house, thus making its use difficult or, at the very least, inconvenient.

Figures 2.3 and 2.4 present the progress that has been achieved in relation to the wells with handpumps and latrines. From these figures it can be seen that this phase of the work is far behind schedule.

2.3 Discussion of Progress to Date

The major problem areas in this phase of the Project are:

- The number of water systems that have been built are fewer than is called for in the project schedule.
- The number of wells and handpumps that have been installed is far below that called for in the project operational plans.
- Only about 30% of the latrines called for have been built whereas about 50% of the time has passed. Many latrines are not being used or are not finished.
- The institutionalization of the progress to date has been very slow.

On the positive side, the water systems that were visited were of quality construction and had operational juntas.

While note is taken of the fact that IEOS has implemented some ideas/mechanisms to accelerate the implementation of low-cost and simple solutions, the team observed that much more effort will be necessary to identify and establish the model that will allow IEOS to build large numbers of simple low-cost water and sanitation systems on the massive scale required.

A major concern of the team was that the efforts to develop the tools for institutionalizing the schemes to be used were not being pursued as vigorously as they should have been. For example, after nearly two years of the Project, no job descriptions have been written and/or approved for the paraprofessionals called for in the loan agreement.

Conclusion: To correct the problem areas mentioned above IEOS will need to concentrate its future activities in the areas of: 1) establishing specific and realistic goals for the remaining water and sanitation activities; 2) examining how low-cost simplified technologies will be identified, designed, built and integrated into the systems to be developed for the Project; and, 3)

Figure 2.3

Latrines In AID/IRD/IEOS and AID/IEOS Areas
March 1984

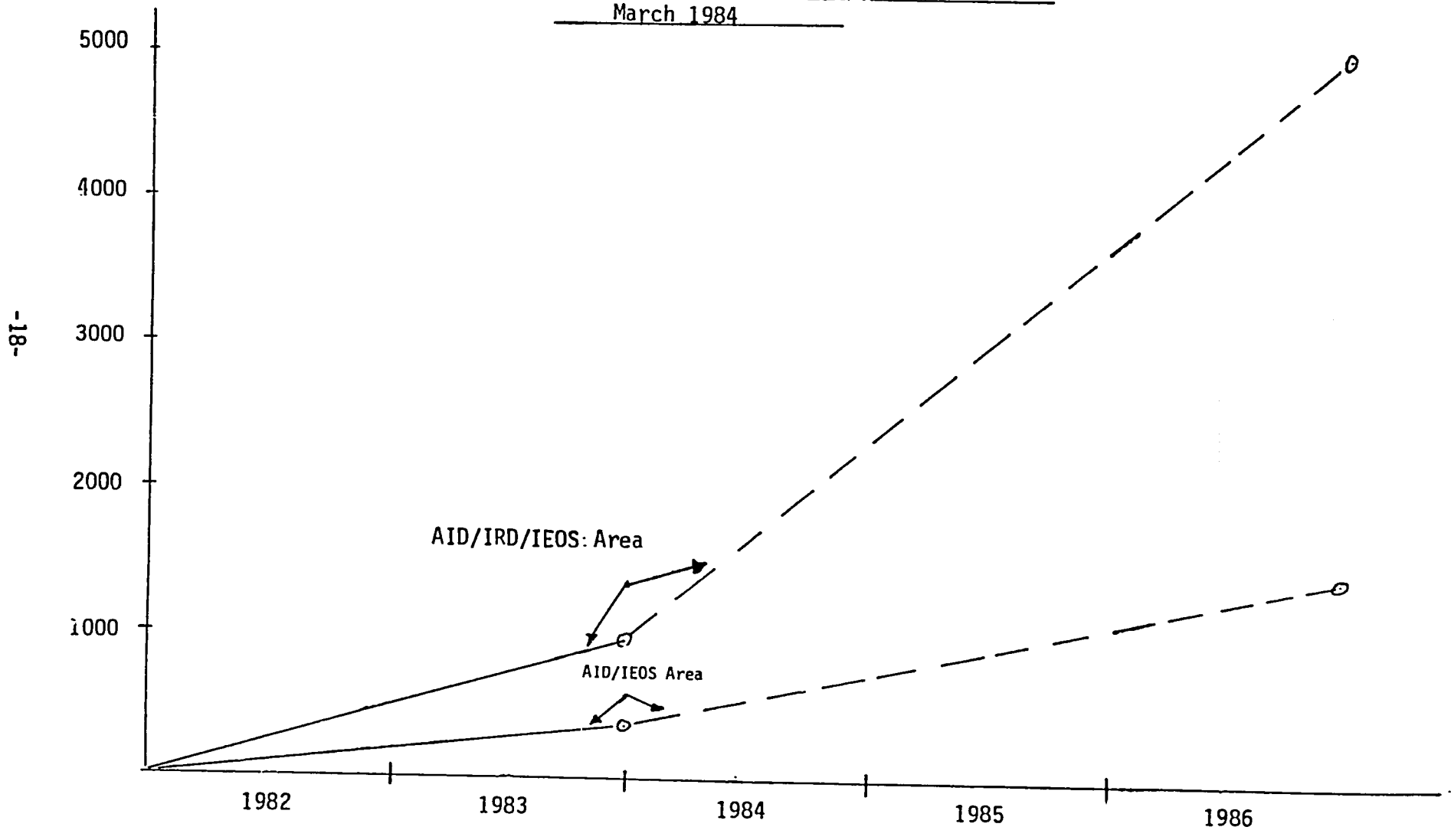
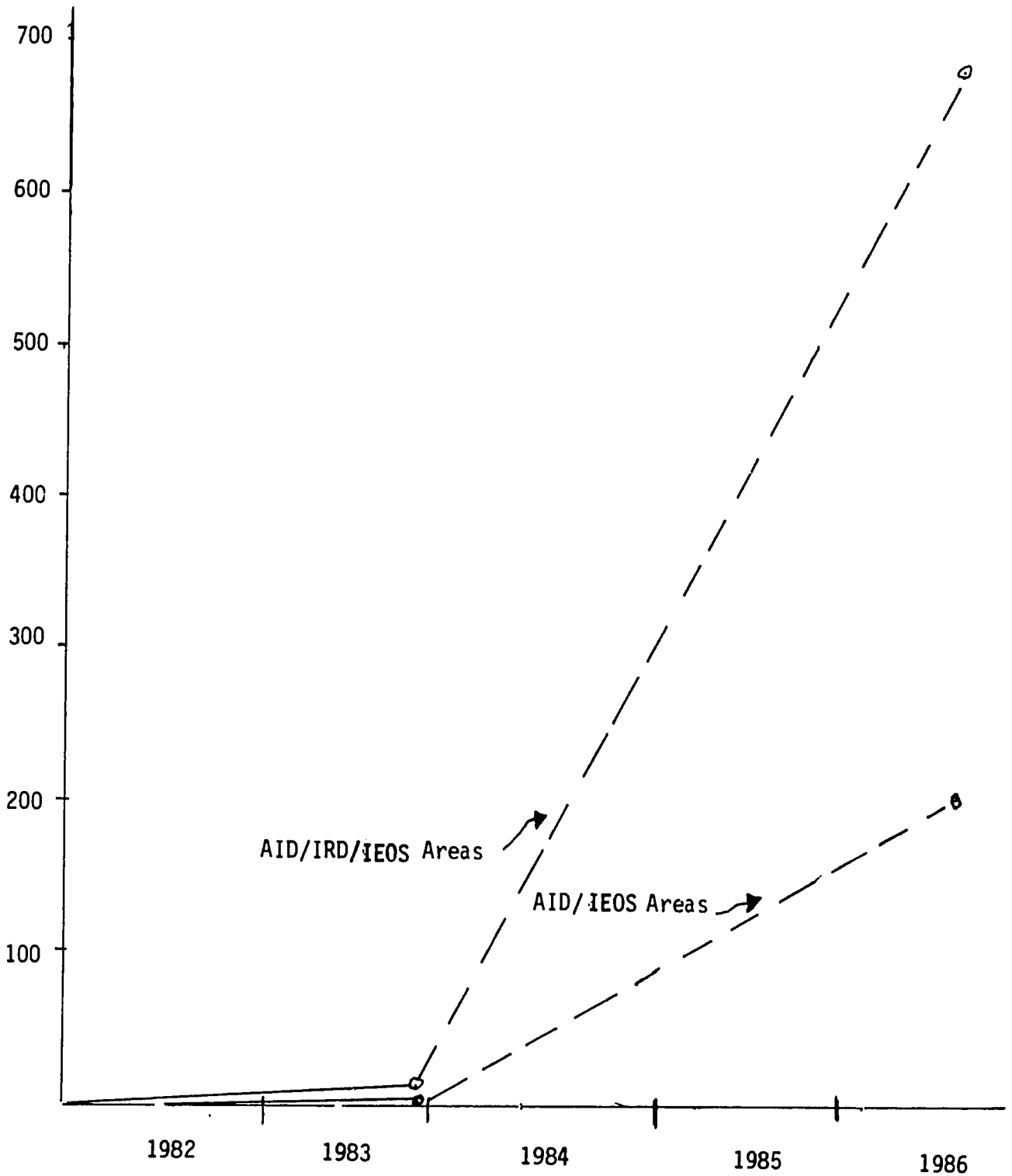


Figure 2.4

Shallow Wells With Handpumps, in AID/IRD/IEOS and
AID/IEOS Areas
March 1984





Locally made
concrete riser
for "dry"-type
latrine



developing job descriptions with clear areas of responsibilities and duties for all of those working on the Project with first priority being given to the paraprofessionals called for in the loan agreement.

Conclusion: The team feels that the water supply and basic sanitation objectives of the Project are attainable, but that the Project needs to focus more of its efforts toward assisting in developing the institutional arrangements for the desired result (i.e., the replicable model).

Chapter 3

INSTITUTIONAL STRENGTHENING

3.1 Proposed Inputs

This component of the Project is intended to improve IEOS's ability to identify, field test and operationalize such appropriate and/or low-cost technologies as will allow that agency to accelerate the country's rural water supply and sanitation coverage from its currently limited scope to a wide-spread and ongoing operational program.

The Project proposes to improve IEOS' institutional capacity to implement rural water supply and sanitation activities by: 1) creating a National Rural Water Supply and Sanitation (RWSS) Coordination Unit; and 2) shifting much of the design, implementation and maintenance responsibility for rural water and sanitation from the central office in Quito to strengthened provincial offices.

3.1.1 Proposed National Level Inputs

In order to achieve the institutional strengthening objective, a series of national level actions were proposed in the Project Paper and the Loan Agreement (see Table 3.1). Of these, the principal activities were to be: 1) the institutionalization of the Rural Water Supply and Sanitation (RWSS) Coordination Unit into IEOS' national structure; 2) the implementation of a training program for professionals and paraprofessionals and 3) building a limited number of water supplies to "learn by doing."

3.1.2 Proposed Provincial Level Inputs

In order to strengthen the IEOS offices in Cotopaxi, Chimborazo, Manabi, Tungurahua, Los Rios and Esmeraldas Provinces so that they could design, construct and maintain RWSS systems, it was proposed to provide: 1) paraprofessional staff; 2) mobile maintenance units; and 3) logistic support. (See Table 3.2.)

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Table 3.1

Proposed National Level Institutional Activities
(summarized from Loan Agreement)

ITEM	RESPONSIBILITIES
<p>1. Create and staff the RWSS Coordination Unit (to be attached to the office of IEOS' Executive Director)</p>	<p>- <u>IEOS</u> will provide staff, salaries, supplies, operating expenses vehicles, maintenance and staff per diem.</p> <p>- <u>USAID</u> will provide technical assistance studies and equipment.</p>
<p>2. Conduct operational research (i.e., feasibility studies and field trials) of such alternate technologies and design modifications as will result in cost reduction through changes in standards, norms, and/or criteria.</p>	<p>- <u>IEOS</u> will implement the studies and try to determine technical and social acceptability of cost reduction devices and/or approaches.</p> <p>- <u>USAID</u> will finance evaluation studies and trials (i.e., hand-pumps, robodevices, purification devices, and simple pour-flush toilets).</p>
<p>3. Provide technical assistance through a full-time Sanitary Engineer Advisor.</p>	<p>- <u>IEOS</u> will provide office space, secretarial services, and the Chief of the Coordination Unit as his counterpart.</p> <p>- <u>USAID</u> will provide these services at no cost to the Project.</p>
<p>4. Provide long and short term training for all levels of IEOS staff as well as develop training plans and courses for improving the areas of promotion, planning, design, construction, and maintenance of low-cost/simplified RWSS system.</p>	<p>- <u>IEOS</u> will provide candidates (professionals, sanitary inspectors, health educators, promoters, engineers, operators, and administrative personnel) and salaries of trainees.</p> <p>- <u>USAID</u> will finance instructors, audiovisual materials, course costs and experts in training plans and testing.</p>

Table 3.2

Proposed Provincial Level Institutional Activities
(summarized from Loan Agreement)

ITEM	RESPONSIBILITIES
<p>1. Provide at least ten para-professional staff members who will be utilized to do simple design, promotion, inspection, and supervision for RWSS system.</p>	<p>- <u>IEOS</u> will provide salaries and training for ten individuals and incorporate them into IEOS provincial offices and IRD project implementation units for Chimborazo, Cotopaxi and/or Manabi.</p> <p>- <u>USAID</u> will provide financial and technical assistance in training of the paraprofessionals as well as logistic support.</p>
<p>2. Provide and equip maintenance units to assist communities in routine and preventive maintenance of RWSS systems including handpumps.</p>	<p>- <u>IEOS</u> will provide salaries and training for six mechanics and six helpers to fix trucks as well as vehicle operation and maintenance costs.</p> <p>- <u>USAID</u> will provide and equip six maintenance vans.</p>
<p>3. Provide items of logistic support to ensure efficient operation of IEOS provincial offices in Chimborazo, Cotopaxi, and Manabi, Tungurahua, Esmeraldas, and Los Rios (i.e., trucks, motorcycles, mobile maintenance vans, pickups, as well as topographic, drafting, water-testing, maintenance and audio-visual equipment).</p>	<p>- <u>IEOS</u> will provide operation and maintenance costs for vehicles and materials.</p> <p>- <u>USAID</u> will provide six dump trucks, twenty one pick-ups, eighty motorcycles, three jeeps and equipment.</p>

3.2 Progress Towards Objectives

3.2.1 Increased Ability to Implement RWSS Projects

After visiting five provincial field offices and eleven field projects, it is the opinion of the team that IEOS has made only limited progress at the national level toward institutionalizing those measures that will permit it to design, implement and backup the thousands of small RWSS systems that will be needed in the next few years. At the same time, the team found that a number of encouraging steps (i.e., use of promoters to assist engineers and use of contractors for civil works) have been taken at the provincial level. While these are usually dispersed and uncoordinated activities carried out by various provincial engineers with little help and/or support from the IEOS and/or SEDRI central offices they should be encouraged and the coordinating unit should be seeking ways to formalize them.

Conclusions: IEOS needs to focus more attention on how to increase its ability to implement RWSS Projects. Also, more attention needs to be given to the various initiatives started by the provincial offices (i.e., use of promoters as paraprofessionals, contracts for civil works, etc.).

3.2.2 Reduced RWSS Costs thru New Low-Cost Technologies

Table 3.3 shows the progress that the team found had been made in operationalizing each of the low-cost technologies mentioned in the Project Paper (PP) or Loan/Grant Agreement.

As one can see from the table only the pour-flush latrine has reached the operational stage. Observation of existing latrine installations reveals that only about half of the units were being used, indicating a need for more promotion and user education. The team found many units without walls and many soaking pits without proper covers. The team also observed that the concrete unit being used requires more care to keep clean than the ceramic unit originally contemplated. Each of these items will require more attention by the promoter in future projects.

Conclusion: Little evidence could be found that IEOS was making progress in reducing its RWSS costs through testing and/or application of low-cost simplified technologies. The team feels that unless substantial changes are made current efforts will not result in significant cost reductions.

Table 3.3

Status of Testing/Application of Low-Cost Technologies

ITEM	Status of Testing	Status of Application
1. Handpumps	18 handpumps have been installed and data is being collected but not analyzed.	1,000 pumps have been ordered but only approximately 250 have been delivered.
2. Locally made water filter	IEOS has completed bacteriological testing of first batch and found filters unsatisfactory.	This unit is not yet ready for field application.
3. Robodevices	Laboratory testing has been completed for robovalves. Units stored awaiting field testing. Robovalves were field tested in San Juan y Sarapamba.	Preliminary test data indicates that the robovalve is not socially acceptable. Its application appears limited as long as IEOS continues to use metered connections.
4. Pour-flush latrine	Testing complete and locally made concrete unit selected.	Locally made units are being installed in many IEOS Projects.

Examples of poor latrine construction



Unused latrine

3.2.3 Is the RWSS Coordinating Unit Effectively Coordinating Activities?

In seeking answers to this question the team took particular note of the fact that the Coordinating Unit has not been formed as proposed in the Project Paper (PP). Examining the IEOS structure, one finds a Directorate of RWSS which reports to the IEOS Executive Director instead of a coordinating unit. While this is a large step forward for RWSS in general, one finds that as the Directorate must respond to many sources of financing (special assignments, CARE, etc.) the time for SEDRI/AID/IEOS projects is greatly reduced. It should also be noted that since its inception most of the work of the Directorate has been for villages having populations larger than that usually found in SEDRI/AID/IEOS Projects. In addition, the team found that few of the engineers of the RWSS Directorate had been trained in RWSS approaches and techniques. As a result, IEOS is finding it difficult to stop doing what they are used to doing (i.e., building large piped water systems) and focus its attention on developing work habits and criteria for this new area (i.e., small villages).

Cost reducing norms, standards and/or techniques were to be made a priority action by the Central Office and, while the team was not able to find evidence of that, it did find the provincial engineers, who must apply the concepts, were the group most receptive and interested in such approaches.

Conclusion: In order to better focus IEOS's attention and resources onto low-cost simplified techniques and approaches, it is increasingly clear that a project focal point must be established within the Direccion Nacional de Saneamiento Basico Rural at IEOS/Quito as quickly as possible. Thereafter, attention should be given to establishing similar focal points in the provincial offices handling SEDRI/AID/IEOS or AID/IEOS projects.

3.2.4 USAID Sanitary Engineer's Role in Functioning of the Unit

As the Coordinating Unit had not been formed as originally contemplated, the team examined the USAID engineer's role in the activities of the Directorate.

The team found he had been a positive influence and was well respected for his technical and administrative abilities. They found he had served as a useful channel between SEDRI, IEOS and AID to resolve many financial and administrative difficulties. It is the opinion of the team that the Project would not have been able to advance to the degree it had if such a full-time person had not been assigned to the Project.

Taking note that the major focus of the engineer during the first stages of the Project has been to ensure the construction of the systems, the team feels it is now time for him to shift his emphasis to the following areas: 1) evaluating and institutionalizing the administrative systems resulting from the SEDRI/IEOS and IEOS/AID "learn-by-doing" experiences; 2) further developing the "paraprofessional" concept and institutionalizing it into the IEOS provincial efforts; and 3) furthering trends being started by the provincial engineers in such areas as contracting civil works and doing designs in the provincial offices.

In making the above suggestion the team is not recommending that the engineer stop serving as the catalyst in financial and administrative matters, but that he reorient his focus to be the driving force behind the institutionalization of the "paraprofessional" concept and the "learn-by-doing" experience.

Conclusion: The engineer has been a positive and active element in project achievements to date. However, it is now time to refocus his efforts to the areas mentioned above.

3.2.5 Training Being Provided

Table 3.4 shows the various training efforts that were called for in the project document vs. the work that has been carried out to date.

Table 3.4
Training Provided by Project

Proposed Training Effort	Action to Date
<p>1. Four professionals to be sent for master level, long term, out-of-country training focusing on promotion, planning, design, construction and maintenance of RWSS.</p>	<p>1. No action to date on this matter. Since the Project indicated that they felt that this element was inappropriate, these funds have been rescheduled.</p>
<p>2. Short-term training will be provided to central office staff and representatives for other organizations and private voluntary organizations in such areas as project administration, community motivation, and utilization of low-cost RWSS technologies.</p>	<p>2. Five professionals were trained in CEPIS (Lima, Peru) in appropriate technology in May 1982.</p>
<p>3. Short-term training will be provided to improve the skills and performance of provincial level sanitary inspectors, health educators, promoters, engineers, RWSS system operators and administrators in the areas indicated in Item 2.</p>	<p>3a. One course was given to 26 IEOS promoters and 12 sanitary inspectors from other official agencies and the Peace Corps in May 1982.</p>

Proposed Training Effort	Action to Date
	<p>b. A one week course for operators of pumping systems was held in Santo Domingo attended by 20 operators in October 1983.</p> <p>c. Two other courses for system operators were conducted in May and September of 1983 for a total of 47 participants.</p> <p>d. A one week course for promoters, specifically on the use of Millipore bacteriological test kits was given to 20 participants in January 1984.</p>
<p>4. Purchase audiovisual equipment and training equipment and cover local costs (transportation and per diem).</p>	<p>4. As no overall training effort has been organized, these elements have not been purchased and/or programmed.</p>
<p>5. Finance short-term US consultants to assist IEOS to identify specific training needs, develop training plans, and design and test training courses.</p>	<p>5. This project element has not been carried forward in an active and organized manner. More attention needs to be given to this in the future.</p>
<p>6. At least ten paraprofessionals will receive intensive training in the design, construction and maintenance of low-cost RWSS systems.</p>	<p>6. Until a job description is agreed upon for this element (paraprofessional/promoter), only a limited amount of training can be conducted for this area.</p>
<p>7. At least two paraprofessionals will receive third country training.</p>	<p>7. Nothing is planned for this element. The project feels this training could be better done in-country.</p>

The team could not find a coordinated (SEDRI/IEOS-National/Provincial) plan for developing the human resources needed for this Project. It appeared to the team that as the institutional relationships were not fully and clearly defined and as many positions did not yet have agreed upon job descriptions the Project had not been able to develop in this area. It was felt that, until relationships were clarified and job descriptions developed, any efforts at training would be less than effective.

Conclusion: This is one of the areas that should be given more attention in the future. The Project should first clearly define what administrative structures will be used and then help SEDRI and IEOS to define job descriptions for the various levels of staff who will be responsible for the rural water and sanitation effort (i.e., paraprofessionals, promoters, engineers and administrators). Once this is done, a long-term comprehensive training plan should be developed to guide this effort.

3.2.6 Paraprofessional Training

The team found much confusion in regard to this term "paraprofessional." In spite of being told that IEOS would not "accept" the use of this type of person, the team found that many of the IEOS "promoters" were carrying out elementary designs, acting as construction inspectors as well as doing their regular "promoter" duties. When this situation was investigated, it was found that this was often occurring because the IEOS provincial engineers were so overloaded that they had turned to the promoters for help.

While the IEOS Central Office was aware of this situation, and did little to prevent it, the team felt that they did not fully understand the importance of the role that the "promoters" were playing. While the provincial engineers had become much more aware, they often felt they needed to maintain the fiction of no "paraprofessionals" in order not to be in unnecessary conflict with IEOS/Quito.

Conclusion: While a good start has been made in this area, IEOS should: 1) develop a job description for the paraprofessional and have it approved internally; 2) organize courses responding to that description to train existing staff; and 3) conduct studies to determine how the paraprofessional concept should be modified in the future to fit the experience gained during the Project.

3.2.7 Rural Maintenance Units

The team found that the vehicles that had been sent to Chimborazo, Cotopaxi and Manabi Provinces had neither been equipped nor placed in operation as mobile maintenance units. In addition, the team found that no firm plans had been developed for training and/or using the mechanics and their helpers. At the provincial level, no firm plans had been made for how this equipment and staff would be used or located. Further, local juntas were unaware of the proposed support for their routine and preventive maintenance efforts and/or how to call on it.

In discussions with IEOS and AID, it became clear that there was a strong opinion that the use of mobile maintenance units would only increase the dependence of the juntas on IEOS. The feeling of IEOS and the AID sanitary engineer was that as most of the systems in the Project were gravity fed, the need for this element was very low. They felt that as more pumped systems and handpumps were installed, IEOS would better understand the need for such a "backup" system.

Conclusion: Planning should be started immediately for developing alternative schemes of when and where mobile units could be used. Once this has been done and a model agreed to by IEOS, then planning should be started for: 1) how the vans should be equipped and deployed; 2) how the mechanics and their helpers would be trained; and 3) how the juntas should be prepared to receive this service. The team suggests this should be started in an area which will have large numbers of pumped systems and handpumps.

Chapter 4

INSTITUTIONAL ARRANGEMENTS

4.1 Current Inter-Institutional Arrangements

The original inter-institutional arrangements (SEDRI/IEOS/AID) between the various agencies are defined in a series of agreements: Basic Loan/Grant Agreement, SEDRI/IEOS, SEDRI/JRH-Jipijapa, JRH/UPOCAM. In the 1982 amendment to the Basic Agreement an additional financing mechanism was established (i.e., IEOS/AID). Both types of inter-institutional arrangements will be discussed in the following sections.

4.1.1 SEDRI/IEOS/AID Funding

The Project Loan and Grant Agreement calls for the Secretariat of Integrated Rural Development (SEDRI) to coordinate all rural water system and basic sanitation activities thru IEOS. The original project paper called for RWSS activities to be carried out in the Integrated Rural Development (IRD) Areas of Quimiag-Penipe, Salcedo and Jipijapa. To do this, SEDRI and IEOS signed an agreement (SEDRI/IEOS) under which IEOS would construct rural water systems and latrines in Quimiag-Penipe and Salcedo. After construction, IEOS was to work with the juntas to ensure long-term operation.

In the Jipijapa IRD, a different set of administrative arrangements was used. The Hydraulic Resources Junta (JRH) of Jipijapa and Pajan signed an agreement with SEDRI and IEOS under which the JRH would build rural water systems and IEOS would act as a "Fiscal de obras" (Inspector of Works). The JRH would see to the long-term operation in conjunction with the juntas of the systems. A second tier contract was signed between the Provincial Union of Agricultural Workers of Manabi (UPOCAM) under which the latter would be responsible for: 1) drilling 100 wells and installing handpumps on them; and 2) construction of 500 latrines. AID would provide the handpumps.

Figure 4.1 shows the relationship and responsibilities of SEDRI, IRD, IEOS, JRH, and UPOCAM under the SEDRI/AID Loan/Grant Agreement. The cash flow for this arrangement is as follows: AID provided advance funds of 15.4 million sucres to SEDRI/Quito for a number of activities including water supply and sanitation. SEDRI provided an advance to the IEOS Provincial Offices thru its IRD offices. Periodically the IEOS provincial office forwards bills to the IRD office for payment. As its advance is used up, the IRD requests repayment from SEDRI/Quito (see Figure 4.2). At the time of their visit, the team found that the IEOS had been experiencing serious delays (6 to 9 months) in being paid for work that had been done (see Table 4.1). It is interesting to note that the IEOS office has often continued working on the Project after exhausting their IRD funds. While this allows the construction to advance, it means that IEOS has often been overexpended. As the time of the repayment increases the work slowdown on the Project becomes greater. When compared to IEOS/AID type funding, the SEDRI/IEOS/AID mechanism has resulted in a very unsatisfactory project termination rate. This can be clearly seen for example

Figure 4.1

SEDRI/AID Relationships

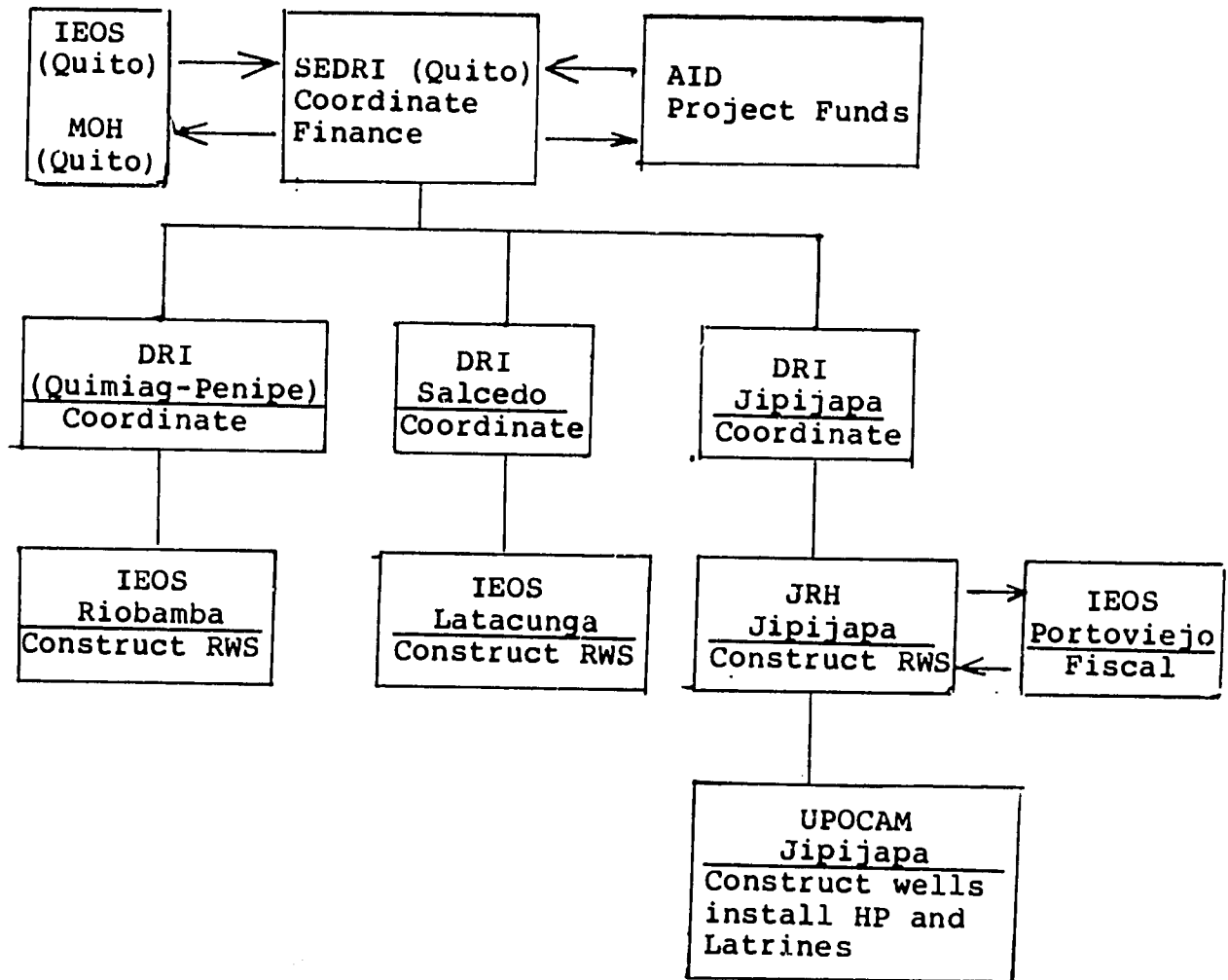


Figure 4.2

PROPOSED IEOS/IRD/SEDRI/AID REIMBURSEMENT SEQUENCE

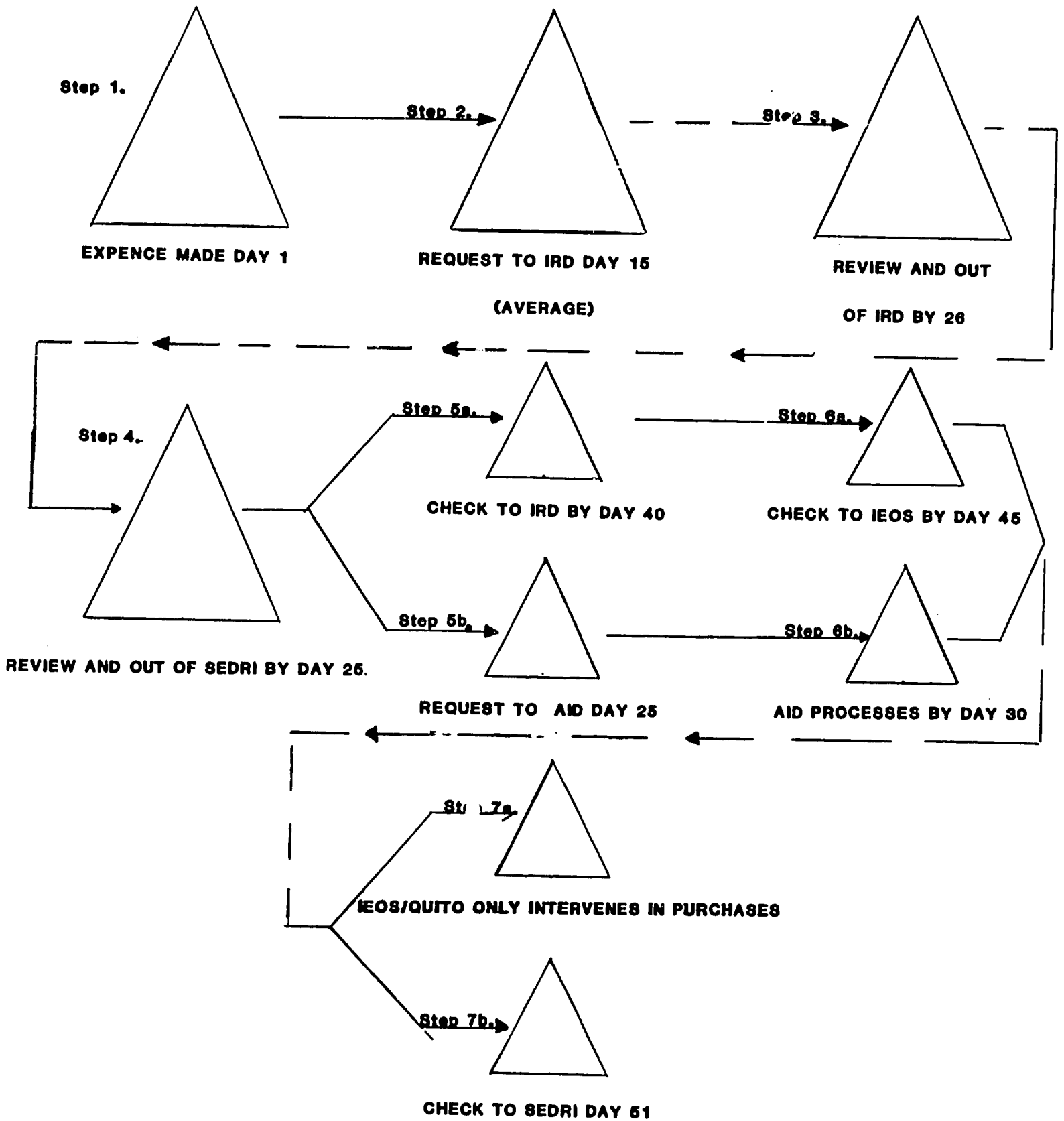


Table 4.1

Reimbursement Times for IRD and IEOS Projects

In order to get an idea of time required for full-cycle cash flow to occur, four bills were selected randomly from old vouchers, with the following time sequence:

<u>IRD Projects</u>	
Cusubamba-Mulalillo	
Contract for pipe signed	June 23, 1983
Pipe delivered shortly thereafter	
Vendor paid by IEOS	September 8, 1983
SEDRI made request to AID	January 24, 1984
AID processed and approved request	February 3, 1984
Check arrived at AID and picked up by SEDRI	February 24, 1984 (approx.)
IEOS reimbursed	Not yet (April 15, 1984)
Papahurco	
Metal lids purchased	September 10, 1983
IEOS paid vendor	September 10, 1983
SEDRI sent reimbursement request to AID	January 24, 1984
Voucher processed and approved by AID	February 3, 1984
Check arrived at AID and picked up by SEDRI	February 24, 1984 (approx.)
IEOS reimbursed	Not yet (April 15, 1984)
<u>IEOS-AID Projects</u>	
Santa Lucia	
Materials delivered by vendor	November 1, 1983
IEOS paid vendor	November 22, 1983
AID processed and approved request	November 29, 1983
Check to IEOS	Late December
Juan Diego	
Materials delivered by vendor	September 13, 1983
Vendor paid by IEOS	September 13, 1983
Request to AID, AID processed and approved voucher	November 6, 1983
Check to IEOS	Late November

from Table 4.2 where one can see that the current SEDRI/IEOS/AID construction rate is 0.17 systems/month. This is about one-third of what was originally planned (i.e., 0.48 systems/month). With the IEOS/AID rate where the cash flow delay is much less, the system production rate is 0.28 systems/month.

Table 4.2
Completion Rate Per Type of Agreement
as of March 1984

Agreement	Agreement signed	No. started as of March '84	Start Rate	No. completed as of March '84	Completion Rate
			System/month		System/month
SEDRI/IEOS/AID	9/29/81	9 + 5	0.70	5	0.17*
IEOS/AID	9/9/82	15 + 5	1.11	5	0.28*

*Completion Rate under original contract was to be 0.48 systems/month.

The team found that, as a result of recent meetings, the repayment delays between the IRD and IEOS offices in Riobamba and Latacunga were being improved. These meetings need to be continued on a regular basis.

Conclusion: It is clear that unless ways are found to reduce the repayment delays, IEOS will be unable to finish the proposed number of projects within the contract period.

As the objective of the Project is a learning experience (i.e., Development of a model for RWSS), the AID engineer should assist SEDRI and IEOS to identify and reduce delays in the repayment process so that project efforts can be concentrated on the institutional aspects rather than clearing financial paperwork.

The monthly working-level meetings that have been started in Riobamba and Latacunga should be given the highest importance by both IEOS and the respective IRD offices and should be expanded to cover all the provinces in which the Project is to operate.

The supervisory staff of each institution should make the implementation of the decisions of these working meetings one of their top priorities. They should do this by helping each province to set goals which will result in increased construction rates, more use of paraprofessionals and more effective community participation.

4.1.2 IEOS/AID Funding

In the project amendment (signed 9/29/82) AID agreed to: 1) fund additional rural water and sanitation systems in the Jipijapa IRD, and 2) carry out rural water and sanitation activities outside of IRD projects in six provinces.

Figure 4.3 shows the relationship and responsibilities of IEOS and its provincial offices. The actual flow of cash is expedited through a series of revolving funds at IEOS/Quito and IEOS/Province (see Figure 4.4). The system, which has worked quite well, is as follows: IEOS/Quito is given an AID advance funding. They in turn provide an advance to each of the six regional offices. As bills are incurred at the provincial level they are paid from the advance and replenishment is requested from IEOS/Quito. The provinces are immediately repaid their expenses from the IEOS/Quito fund. Once a month, IEOS/Quito requests a replenishment from AID/Ecuador for the bills it has reimbursed the provinces. To date the system has worked well. The result has been that even though the IEOS/AID agreement was signed one year later than the SEDRI/AID/IEOS agreement, this financial agreement has allowed IEOS to have started 15 systems (vs. 9 IRD systems in two years) and to have completed 5 systems (vs. 5 IRD systems in two years). (Table 4.2 shows the completion rates per type of agreement.)

Conclusion: While the team found that the IEOS/AID funding mechanism has resulted in fewer repayment delays and in a higher construction rate (0.28 systems/month) than that of SEDRI/IEOS/AID (0.17 systems/month), the mechanism was still not resulting in a system termination rate that would allow the Project to meet its goals. Therefore, the AID engineer should work closely with IEOS to: 1) find the technical, administrative and accounting reasons for the delays; 2) find ways of removing the roadblocks; 3) help develop new procedures; and 4) help IEOS institutionalize the new procedures for increasing the output rate of the Project in a manner that will allow the maximum use of paraprofessionals, community participation and low-cost technologies.

4.1.3 SDA and CARE/IEOS Funding

While these fundings are not part of the SEDRI/AID Project, the team notes that jointly they make up 18% of the systems being built by IEOS (SDA systems are 10% and CARE are 8%). But, as these systems are being built by IEOS using the same approaches as the SEDRI/AID projects, they are considered part of this study.

The funding for the Special Development Assistance (SDA) projects is direct AID to IEOS and apparently has been no problem. The funding for the CARE/IEOS is between CARE and the IEOS provincial offices of Bolivar (one project) and Chimborazo (six projects).

From Table 4.3 one can see that the SDA and CARE projects were completed in a shorter time than either the IRD or IEOS ones. At the same time a higher percentage of CARE systems have been completed than any other type of system and in the shortest time. Of the seven projects in the provinces of Bolivar and Chimborazo six were completed by March 1984 with an average time to complete of five months.

Figure 4.3

IEOS/AID Relationships

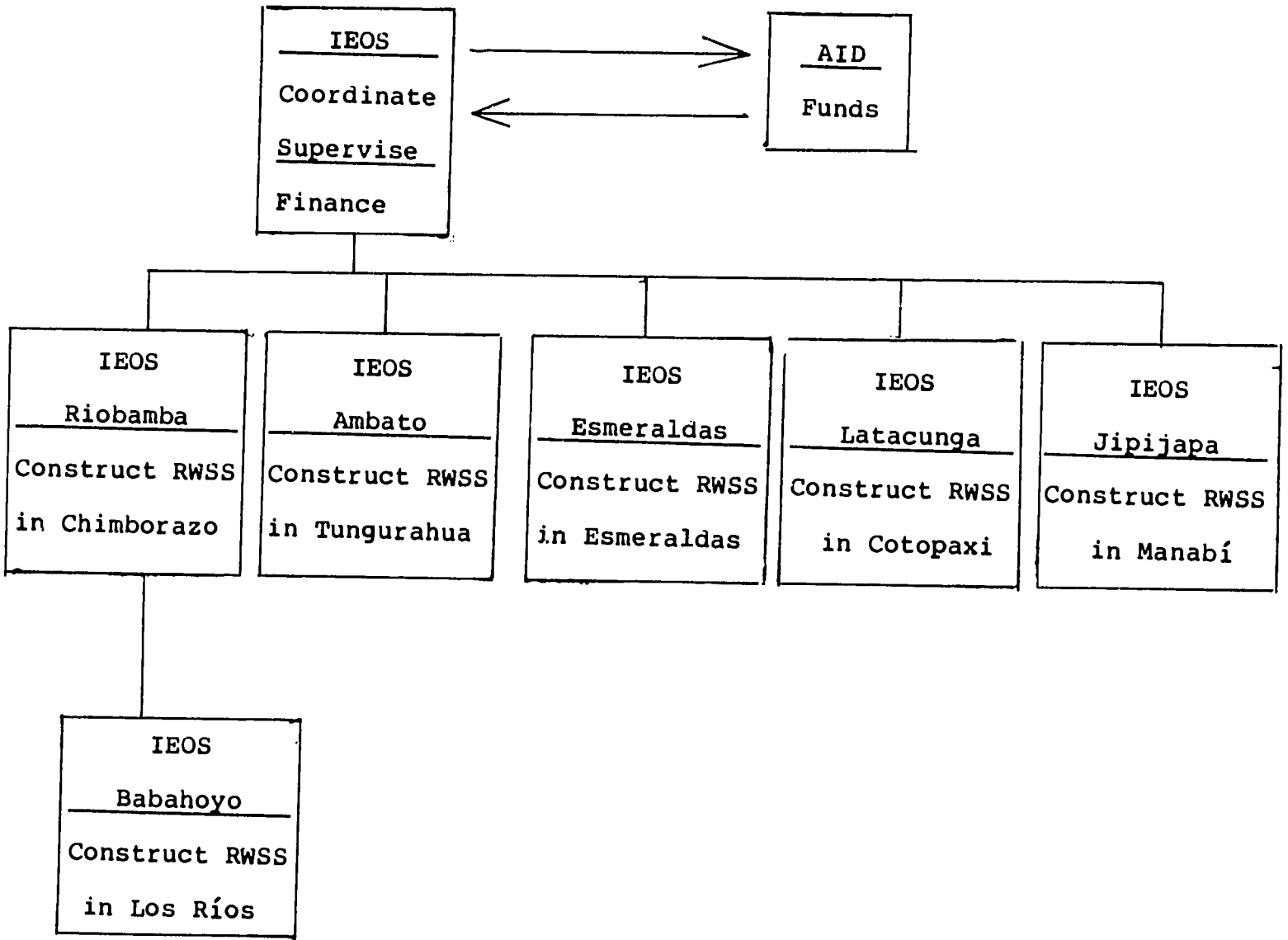


Figure 4.4

PROPOSED-IEOS/AID REIMBURSEMENT SEQUENCE.

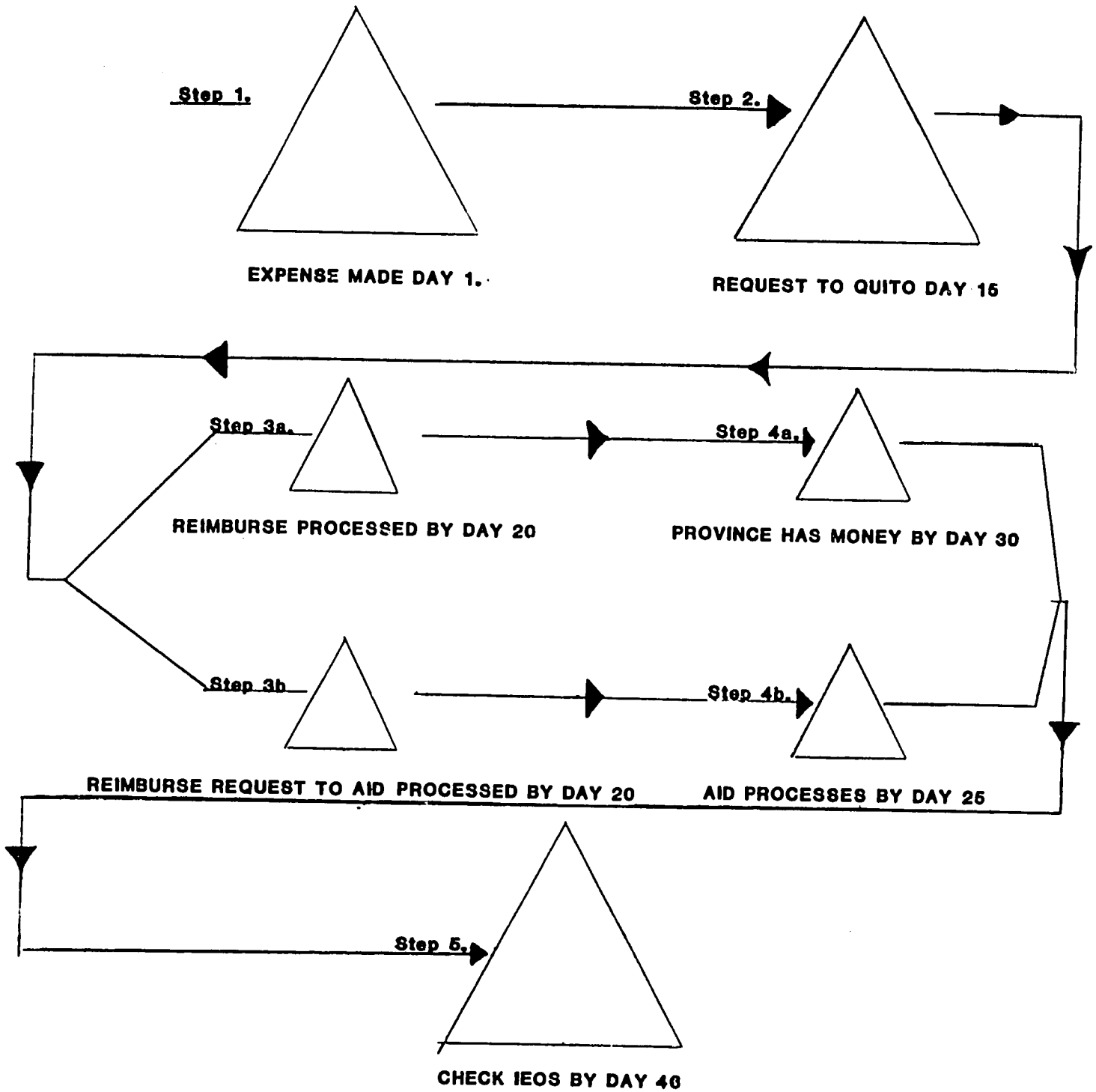


Table 4.3
System Status by Type of Funding

Type of Project	Projects waiting to start		Projects in Construction		Completed Project			Total	
	Systems/ Funds	%	Systems/ Funds	%	Systems/ Funds	%	Avg. Time To Complete	No.	%
IRD	18	55%	9	35%	5	29%	9M	32	42%
SDA	6	18%	1	4%	1	5%	3M	8	11%
IEOS	9	27%	15	58%	5	36%	8M	29	38%
CARE	0	0%	1	3%	6	31%	5M	7	9%
TOTAL	33	43%	26	34%	17	23%	--	76	100%

Conclusion: While the SDA and CARE systems are not part of the Project, the completion times for those which have been completed are less than for either the SEDRI/IEOS/AID or IEOS/AID projects. It would appear that the Project should study these efforts for lessons to be learned.

4.2 Institutional Problems

It appears to the team that the institutional arrangements of the Project are unnecessarily complex and are often the major cause for the lack of progress. As the problems being encountered in the project implementation are best illustrated in terms of the various agreements and funding mechanisms being used, the following sections describe the situations the team found in Jipijapa, Quimiag-Penipe and Salcedo IRDs.

4.2.1 Inter-Institutional Arrangements in Jipijapa

In order to evaluate this phase of the project, the team visited: 1) the IRD and JRH offices in Jipijapa; 2) the Pan and Agua water system; and 3) IEOS offices in Portoviejo.

It is clear to the team that the current institutional arrangements are not giving the desired results. In two years none of the pumped water systems have been completed, only a very limited number of wells and handpumps have been completed and less than the planned number of latrines were installed. No firm plans could be found for finishing the water systems and/or installing additional handpumps and latrines.

The current institutional arrangements are cumbersome and not conducive to clear definition of responsibilities between JRH, UPOCAM, IEOS and IRD Jipijapa. When one adds to this the floods that occurred in the area in 1983, it is little wonder that the work is so far behind the proposed schedule. The team feels that unless major changes are made in the work patterns, there is little hope of finishing the water systems, wells, handpumps and latrines called for in the agreement by the contract completion date.

In examining how the work would be carried out in the future the team found that JRH is now claiming that UPOCAM is not a "legal person" and, therefore, cannot be contracted to perform services (i.e., dig wells, install handpumps and build latrines). Thus, unless JRH and UPOCAM can come to some other arrangement the team feels that this element will be further delayed while JRH finds another contractor. This situation has been known for 4 to 6 months and, in spite of repeated assurances, JRH has not found a solution to how these works will be constructed. While the IRD office has been well aware of this situation, they have done little to help force a solution.

In seeking an answer to this problem, the team examined the support that has been provided to the JRH by the Project. They found that IEOS had provided the services of a promoter as called for in its agreement with the IRD. In turn, JRH has made available to the Project the services of an engineer and a designer. As the team examined the financial arrangements it did not appear they were the reason for any substantial delays. Thus, it appeared to the team that the delays in Manabi have not been due to lack of personnel.

Conclusion: While the technical relationships seem to be good, the major problem in Jipijapa seems to be a lack of institutional willingness to define a solution and vigorously pursue it. This is evidenced by the fact that AID has made numerous attempts to help resolve the problem, but to no avail.

The team feels that consideration should be given to establishing a joint IRD/JRH/IEOS/AID Task Force to revise the existing agreements and to having one institution accept the responsibility for all water systems, wells, handpumps, and latrines in the Jipijapa IRD.

4.2.2 IEOS/IRD Provincial Relationships in Quimiag-Penipe and Salcedo IRD

The team found that the IEOS and IRD offices in Quimiag-Penipe and Salcedo areas have finally arrived at a frank and positive working relationship.

In both areas the team was able to observe working sessions in which problems were discussed openly and with a desire to find solutions. It is the team's observation that while relations have not always been smooth they are improving and substantive matters (for example: delays in payment by IRD; lack of personnel in IEOS, etc.) are being discussed and resolved with increasing frequency.

The team believes that current relationships are such that they can form the basis for future discussions on how to realistically: 1) accelerate the rates

of water system and latrine construction; 2) increase the use of paraprofessionals in the design construction and operation of systems; and 3) increase the use of low-cost simplified techniques and devices.

Conclusion: AID should continue to take the leadership in developing joint monthly operational planning and review sessions for the Quimiag-Penipe and Salcedo IRD together with the Riobamba, Ambato and Latacunga IEOS offices.

4.3 Impact of IEOS/AID vs SEDRI/IEOS/AID Funding

The team found a wide range of construction rates within and between the different systems. For example, the impact of the two types of projects can best be seen by examining Table 4.4 where it can be seen that in Chimborazo the IEOS/AID funding mechanisms have been only slightly better than the IRD/IEOS/AID ones (1.44 construction days per capita vs. 1.68). In Cotopaxi they were nearly equal (0.34 vs. 0.35). (It should be noted that in Cotopaxi both systems served more than one village). In addition, it was clear that the construction concepts used for CARE projects gave much better results than any others.

Table 4.4
Numbers of Days/Capita to Construct
Each Type of System

Province	Construction Days per Capita		
	IKD	IEOS	CARE
Chimborazo (Riobamba)	2.45	1.53	0.28
	2.17	1.36	0.33
	1.03	<u>1.43</u>	0.35
	<u>1.09</u>		0.36
			0.47
			<u>0.40</u>
	Avg. 1.68	Avg. 1.44	Avg. 0.36
Tungurahua (Ambato)	N/A	0.31	N/A
Cotopaxi (Latacunga)	0.35	0.34	N/A

From studying the types of systems, it can be seen that regional systems make more economical use of human resources than individual systems and that while

IEOS/AID systems are more economical with provincial/local resources than are SEDRI/IEOS/AID, CARE/IEOS systems are the most economical in terms of the human, technical and financial resources available to the local user.

Conclusion: AID should develop a joint SEDRI/IEOS task group to investigate the different techniques and approaches used by each of the different funding sources for "lessons to be learned." Special attention should be given to IEOS in Latacunga and CARE projects in Chimborazo.

4.4 IEOS/IRD Provincial Coordination and Responsibilities

4.4.1 IEOS Provincial Offices

The team found that while IEOS had a fully staffed office in each of the provinces of the project there was not a well defined project unit with clearly defined objectives and job descriptions.

Further, the team could find very little evidence that the IEOS/IRD/AID and IEOS/AID projects were handled in a very different manner from regular IEOS projects.

The position of the paraprofessional was poorly defined in all offices and none had a job description or job analysis for this position. In spite of this, the team found that in many cases, because the IEOS office was understaffed, the promoter, by necessity, was carrying out simple design functions and inspecting civil works in addition to his regular duties. This is a trend that should be recognized and formalized.

The team found that the IEOS/IRD coordination was on a continuous but informal basis. Observations of the interaction between IEOS and IRD provincial offices show the need to open more in-depth discussions on: 1) staffing needs for accelerated activities; 2) joint planning; 3) activities for reducing system construction and operating costs; and, 4) increasing the degree and type of community participation in system construction and operation.

Conclusion: While, on the whole, IEOS/IRD relationships are good, there is the need to have the two offices do more joint planning in order to accelerate projects, reduce costs and encourage greater community participation.

4.4.2 IRD Provincial Offices

The team visited the Quimiag, Salcedo and Jipijapa IRD offices. In all the offices, the team found that the SEDRI chief was interested and knowledgeable about rural water and sanitation and felt it was a basic building block in the integrated rural health approach he was trying to develop. And, except in Jipijapa, IEOS was in name and fact the operative agency for water and basic sanitation construction.

As the water/sanitation effort was only one of many programs, IRD usually left the technical details to IEOS. But, the team noted a growing tendency on the part of IRD engineers to try to express technical opinions. This matter should be discussed by IEOS and IRD chiefs.

The teams found that financial matters continue to be a subject for much discussion between IEOS and IRD chiefs. While matters have improved in the last months there is still the need for clearer and better understood procedures. The clarification of financial procedures continues to be an area of particular need, as has been previously pointed out.

In the case of the Jipijapa IRD while the relationship with the JRH was good (the IRD head was a JRH employee on loan to SEDRI) IEOS was supporting IRD and JRH by providing the full-time services of a promoter, by conducting the "fiscalization de obras," and by approving plans. In addition, the team found that JRH was providing accounting support to the IRD office. In spite of all this support, none of the Jipijapa water supplies were operational at the time of the visit. In addition, the question of how wells, handpumps and latrines would be constructed in the remaining years of the project was still unresolved.

Conclusion: In general, IRD offices are adequately staffed for the programming and supervision functions assigned to them. The matter of technical decision should be left to IEOS and the JRH once operational plans are agreed upon. For the Quimiag-Penipe and Salcedo office, more attention needs to be given to developing clearer and better understood reimbursement procedures. In Jipijapa, greater attention needs to be given to how the institutional arrangements can be resolved so that work will be started as quickly as possible.

Chapter 5

COMMUNITY PARTICIPATION AND USER EDUCATION

5.1 General

One of the key concepts of the Project is that in providing drinking water and basic sanitation measures to people in the rural areas the participation of the community is a key element in the success or failure of such efforts. The Project promotes the idea that while the members of the community are the beneficiaries of the system, they are also responsible for its maintenance, for the payment of the operator ("Aguatero") and for the administration of the system.

The Project contemplates the participation of the community during the construction, operation, and maintenance of the water and basic sanitation facilities. Prior to construction, the community signs an agreement with IEOS which sets out the responsibilities of each party. In this the community agrees to establish a junta that will be responsible for the community's contribution of unskilled labor (Mingos, etc.) as well as obtaining the local materials, funds, donation of land, rights-of-way for pipe through private or common lands, and transportation of materials to the work site.

The junta is made up of five members democratically elected by an assembly of villagers of those living in the area. Once the junta establishes its legal personality ("personeria juridica") it has the power to establish contracts and to set water rates for the services to be provided. The IEOS promoter is responsible for organizing the Junta and seeing that they actively participate in the construction, operation, maintenance and administration of the system.

In the agreement (Convenio) signed between the community and IEOS, the users promise to provide at least 20% of the construction cost of the system. Once the cost of the system is known (i.e., a project design has been completed), the junta assigns the amount to be paid by each individual who will participate in the system. This amount is developed by dividing the number of workdays (jornals) by the estimated number of users to obtain the number of "mingos" each family must work. The record of the number of days actually contributed is kept by both the Junta and the IEOS promoter. Tables 5.1 and 5.2 are examples of the forms used to record this data.


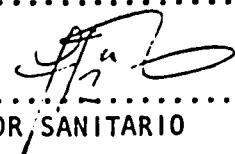
In addition to assisting in the system construction, the community participates in such preliminary activities as identification and selection of the water source, finding local sources of building materials, and defining the type of system to be built.

Prior to finalizing the system the junta hires its system operator, who is usually a local resident. That person will receive in-service training from the foreman who is in charge of the construction work. This effort is considered as part of the Project's effort.

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Table 5.1

DOCUMENTO DE CONTROL DE APORTE COMUNITARIO:

I E O S	I E O S
JUNTA ADMINISTRADORA <i>La Comunitaria</i>	JUNTA ADMINISTRADORA DE <i>La Comunitaria</i>
Control de participación	Control de participación comunitaria
Valor un jorna S/. <i>200/-</i>	Valor un jornal S/. <i>200,00</i>
Ubicación:	Ubicación de la Vivienda:
Manzana <i>..4..</i> Casa <i>..13....</i>	Manzana <i>.....7.....</i> Casa <i>.....13.....</i>
Propietario: <i>Jorge Andrade</i>	Propietario <i>Jorge Andrade</i>
Fecha: <i>Junio 14 - 1983</i>	Lugar y fecha <i>Junio 14 - 1983</i>
 PROMOTOR SANITARIO	 PROMOTOR SANITARIO

Nota : La parte desprendible se entrega al propietario de la vivienda, que haya trabajado en las mingas comunitarias y la parte fija del talonario es para el archivo de la Junta, de donde obtendrá los datos el Promotor.

The maintenance and administration of the system which is performed by the system operator is the responsibility of the junta. The IEOS promoter assists them in establishing a water rate which will cover the costs of operation, maintenance, administration and leave a small amount to establish a reserve fund for repairs and future expansion.

5.2 Project Inputs

5.2.1 Community Participation in Planning

The team found that all of the communities visited had collaborated with IEOS during the planning phase as well as in the preliminary socio-economic/sanitary surveys. While by the very nature of this activity it is not easy to quantify its value, nevertheless, it was possible to identify what activities the people in the communities did participate in. These are shown in Table 5.3. While the team feels that the promoter's role in promoting and guiding the community into an active participation role is an area that needs more work, it also feels that there are other higher priority areas of community participation for the immediate future (i.e., long-term operation and maintenance).

Table 5.3

Planning Activities in which the Communities Participate

Planning Activities in which They Participated 1982-1983
Selection of Drinking Water Source Definition of Type of System Choice of Materials Financing Aspects

Conclusions: The efforts to date in this area have fully involved the community. But, the Project should carefully examine the human, technical and financial requirements to carry on a large scale effort of this type in the future. To do this on a large scale, the Project should clearly define its approach. The team recommends that a consultant be used to help: 1) to document the techniques, approaches, materials and documentation currently being used for involving the community in the planning process for their system; and 2) to clearly understand the personnel needs and the financial costs of the proposed approach.

5.2.2 Community Participation in Financing

As was indicated earlier, a major contribution of the community is in the financing of the construction of the water systems. The combined cash and in kind contribution for this is usually estimated to be 20% of the total physical cost. Obviously, this community contribution will vary for each community and will depend on such things as its site characteristics, type of system, enthusiasm of the dwellers, etc. The value of the individuals' contribution cannot be calculated until all of the "journals" in the 20% contribution have been completed. Table 5.4 shows the actual percentage contributed by communities in the SEDRI/IEOS/AID areas during the last two years.

To maintain the interest of the community and to obtain a financial participation of not less than 20% is a constant task for the IEOS promoter. This effort requires that he constantly visit and work with the community. To do this the promoter must coordinate such things as the opening of ditches, excavations for intake work, reserve tanks, laying pipe, etc., as well as the training of the junta members in the operation, administration, financing and maintenance.

Conclusion: As the Project expands to other provinces, the Project must be sure that additional promoters are added and that they fully understand the importance of their role in obtaining the continuous financial (i.e., cash and kind) support from the community. For if such support is not forthcoming future programs will be limited to only the funds available from the government. In view of the fact that the communities are now meeting the 20% goal, the Project should now turn its attention to examining how the community will finance its long-term operational costs (i.e., system operation, preventive maintenance, chlorination, expansion, etc.).

5.2.3 Community Participation in Operation and Maintenance

In all the services constructed in the AID/IRD/IEOS and AID/IEOS areas, as in all of the systems built by IEOS, the system's operation is the responsibility of the junta. They also select an inhabitant of the village and hire him as the system operator.

Depending on the complexity of the system, the operator will work full or part time after receiving training from the promoter and/or the foreman in charge of building the system and, when appropriate, by the project engineer. The training of the operator covers such aspects as:

- Elemental knowledge about water-related diseases
- Description of the drinking water supply system
- Operation and maintenance of the system
- Disinfection of the water
- Chlorine dosages
- House connections
- Meter reading and maintenance
- Knowledge of the system and management of valves
- Human relations and user education techniques

TABLE 5.4

COMMUNITY PARTICIPATION IN FINANCING
OF DRINKING WATER SYSTEMS

PROVINCE AND COMMUNITY	TOTAL COST (1,000 sucres)	COMMUNITY PARTICIPATION (1,000 sucres)	PROJECT AREA	
<u>Chimborazo</u>				
Coto Juan	540	108	20%	AID/IEOS
Tepeyac-Gatazo	460	92	20%	AID/IEOS
Juan Diego	425	85	20%	AID/IEOS
Penicucho	500	100	20%	AID/IRD/IEOS
Shamanga	800	160	20%	AID/IRD/IEOS
Utufag	650	130	20%	AID/IRD/IEOS
Ayanquil-Azacucho	830	166	20%	AID/IRD/IEOS
<u>Tungurahua</u>				
Echaliche	1,100	220	20%	AID/IEOS
<u>Cotopaxi</u>				
Sigchos	2,980	1,120	37.6%	AID/IEOS
Papahurco-Cham- bapongo	3,000	600	20%	AID/IRD/IEOS

In pumped systems, the operator completes his training by covering such areas as:

- Pump equipment
- Electrical systems
- Operation and maintenance of the pump, generator, etc.

Operation and maintenance costs for each system are covered by the collection of water rates which are set at such a level as to cover the operator's salary and the purchase of the calcium hypochloride for disinfection. This leaves a small amount which will be used to build a reserve for maintenance and improvements.

The mobile maintenance unit concept of the project paper was intended to support the local operator. The team found that this element of the Project was still being discussed and it appeared it would not be in place in time to gain any useful experience with the concept prior to the end of the Project. This concerns the team greatly.

Conclusion: The Project needs to develop a generic job description for system operators (gravity-fed and pumped) in order to standardize the work of the local operator and to describe how the promoter and/or the mobile maintenance van will support the local operator. This should be given a high priority in order to ensure that the users will be able to enjoy the benefits of the system over the long-term.

5.2.4 Community Participation in System Administration

The local administration of the water system and the latrine program is the responsibility of the Administrative Junta which is organized prior to delivering the services to the community. The members of the junta are selected at a village meeting and are not paid any salary. The junta meets periodically to determine its monthly balance and to approve the purchase of the materials necessary for operation and maintenance.

Basically the junta maintains the following documents:

- Record of meetings
- Daily account book and statement of accounts
- Register of users
- Meter reader control cards
- Connection requests
- Receipts for payment of water bills
- Meter reading cards
- Disinfection control cards
- Community participation register

By law the water rates are determined jointly by the junta and IEOS and must cover the costs of operation, maintenance and administration as well as develop a small surplus that will be used for a small capitalization fund. Table 5.5 is an example of some of the water rates being charged in the SEDRI/IEOS/AID, IEOS/AID and IEOS/CARE/AID systems.

Table 5.5

Ejemplo de Tarifas Vigentes en el Area Rural
Example of Current Water Rates in Rural Areas

PROVINCE AND LOCALITY	BASIC (sucres)	EXCESS (sucres)	PROJECT AREA
<u>Chimborazo</u>			
Coto Juan	S/25/15m ³	S/3/m ³	AID/IEOS
Penicucho	S/20/15m ³	S/3/m ³	AID/IRD/IEOS
Shamanga	S/20/15m ³	S/3/m ³	AID/IRD/IEOS
Utufag	S/20/15m ³	S/3/m ³	AID/IRD/IEOS
Ayanquil-Azacucho	S/20/15m ³	S/3/m ³	AID/IRD/IEOS
Juan Diego	S/25/15m ³	S/3/m ³	AID/IEOS
Tepeyag-Gatazo	S/25/15m ³	S/3/m ³	AID/IEOS
Gahuijón	S/10 Flat Rate	S/3/m ³	AID/CARE/IEOS
Ilapo	S/30/15m ³	S/3/m ³	AID/CARE/IEOS
San Andrés	S/35/15m ³	S/3/m ³	AID/CARE/IEOS
<u>Tungurahua</u>			
Echaliche	S/30/10m ³	S/5/m ³	AID/IEOS
Huangalo-Rumipamba	S/30/10m ³	S/5/m ³	BIRF/IEOS
El Rosario	S/30/10m ³	S/5/m ³	BIRF/IEOS
<u>Cotopaxi</u>			
Papahurco-Chambapongo	S/60/10m ³	S/6/m ³	AID/IRD/IEOS

Conclusion: As the Junta is the "heart" of the community participation approach, the Project must ensure that its concepts and approaches are clearly documented and well understood by all levels of the organization. While all elements of the approach must be in balance, those of financing, operation and maintenance must be given priority. Efforts to date have not clearly focused on the long-term aspects of this element. (For example: How does the Project keep a volunteer junta operational over the entire life of the system?) This long-term aspect needs to be given more attention in the second half of the Project.

5.3 Problem Areas

The area of community participation has not been a major problem area. In most cases, the villagers are participating to varying degrees in the various phases of the process (i.e., identification of sources, project design, construction, administration and maintenance) with the most direct participation being that of providing labor for the system construction. The areas of the long-term system administration, operation and maintenance are areas that are still weak and need more attention. The area of the community's participation in the design process will also require refinement in the future.

The major problem that the team found in regard to the work contribution was that during the system construction there are often a limited number of people who do not complete the "Journals" assigned to them, thus resulting in their losing the right to a "free" house connection. For these people to obtain a house connection in the future, they must pay double the cost of the connection. In some cases, this has resulted in limited system coverage and future expansion because people don't have enough cash to purchase the connection. To resolve this problem the Project will need to find an equitable method for allowing cash-short people to purchase house connections once the system is in operation. Without such a mechanism the individual systems will not be able to expand their customer base.

The villagers that the team talked to felt that the water rates they had to pay were reasonable and usually expressed the opinion that the services benefitted the community by protecting its health and as such should be cared for and paid for.

5.4 Suggestions for Improvement

The team felt that IEOS had done a good job of understanding the community participation process and in integrating the engineers, the promoters and other project staff into the different phases of this work. In addition, the team found that the communities that were visited were convinced of the benefits to be obtained by constructing the new water and sanitation systems and that their efforts would improve the quality of their life and health.

Conclusion: In order to ensure the continuation of the systems being built, the team feels that the USAID engineer should give a high priority to obtaining a greater long-term involvement of the community in system operation, maintenance and financing.

Chapter 6

COMMODITY INPUTS

6.1 Project Inputs

In this section the team presents its findings in relation to the vehicles and equipment the Project has provided to IEOS. After presenting the findings, the team presents conclusions regarding what should be done to improve the particular problem encountered.

The following tables describe the inputs of commodities in terms of vehicles and equipment provided to support the objectives of the Project.

Table 6.1 shows the type of vehicles delivered to IEOS for institutional development at national and provincial levels, the location, date of arrival, and the actual working conditions.

Table 6.2 indicates the equipment purchased and delivered to IEOS to support the development of new technological areas such as the water quality investigations in the rural areas.

6.2 Project Benefits

The pick-up trucks delivered to the provinces are being assigned to the engineers working on the AID/SEDRI/IEOS projects in Chimborazo, Cotopaxi and Manabi and to the professional in charge of the AID/IEOS projects in Tungurahua, Esmeraldas, and Los Rios. The motorcycles were assigned to provincial promoters who work in the AID/SEDRI/IEOS and AID/IEOS projects in the six provinces. This input has enabled the promoters to speed up their activities by reducing the travel time. Promoters were given training on the operation and maintenance of these vehicles.

The maintenance vehicles called for in the project paper are not yet in operation because they have not yet been adapted to carry the tools and material which will be needed for preventive and routine maintenance of the systems. The units, which are pick-ups similar to the others provided by AID, are currently being used by the provincial offices for supervision activities.

Of the vehicles purchased for the Rural Sanitation Coordinating Units, one is assigned to the AID advisor engineer and the others are used by IEOS engineers and promoters from the central office whose responsibility is to coordinate the activities in the six provinces.

The six millipore bacteriological test kits that were provided to the Project are in use in the provinces and two are being used by some experimental projects that are being started. Two chemical test kits and one theodolite are also assigned to the field.

The provision of new vehicles to the National Direction of Basic Rural Sanitation has permitted the central level to increase its coordination and supervision activities in the provinces. These vehicles allow the IEOS

Table 6.1

Status of Transport Provided to Project

LOAN PROJECT INPUTS PURCHASING OF VEHICLES	COMPONENT DELIVERED			
	COMMODITY	LOCATION PROVINCE	DATE ARRIVED AT LOCATION	WORKING CONDITION
1. Purchase 5 vehicles for Rural Sanitation Unit	3 Jeeps	Quito	July-Sep. 83	Good
	2 Pick-up Trucks		Oct.-Dec. 83	Good
2. Purchase 12 pick-up trucks for IEOS provincial offices.	12 Pick-up Trucks	Provinces*	Jan.-March 83	Good
3. Purchase 6 dump trucks for IEOS Provincial Offices.	6 Dump Trucks	Provinces*	July-Sep. 83 Jan. 84	One broken in Chimborazo
4. Purchase 7 maintenance vehicles for IEOS provincial offices.	7 Pick-up Trucks	7 in Provinces	Oct.-Dec. 83	Good. These units are not being used as main- tenance units but for supervision activities.
5. Purchase 18 motorcycles for promoters in IEOS pro- vincial offices.	18 Motorcycles	Provinces*	Jan.-March 83	Good

* 3 Pick-up Trucks, 1 Dump Truck, and 1 Motorcycle are in Provinces outside the Project Area.

Table 6.2

Status of Equipment Provided to Project

LOAN PROJECT INPUTS PURCHASING OF EQUIPMENT	COMPONENT DELIVERED			
	TYPE	LOCATION	DATE ARRIVED AT LOCATION	CONDITION OF USE
1. Purchase of Survey Component.	1 Theodolite	Quito		Good
2. Purchase of Drawing Equipment.	- This element is under continual review.			
3. Purchase of Bacteriological Testing Kits.	8 Millipore Kits	6 in Provinces		Good
4. Purchase of Chemical Testing Kits.	2 Hatch Kits	Quito		Good
5. Purchase of Audio-visual Equipment.	---	---	This material is being requested from various agencies (i.e., WASH).	

supervisory engineers and promoters to make bi-weekly visits to each of the six provinces of the Project. In order to optimize the utilization of the vehicles, each coordination team consists of an engineer and a sanitary educator/promoter with both team members having extensive experience in rural areas. The team members also coordinate other programs that IEOS has in the area. While this is administratively logical, it does tend to dilute IEOS' attention to the Project's efforts.

In the provinces, the ability to visit the projects, to coordinate inter-institutional actions and to transport materials has greatly improved as a consequence of assigning the vehicles. In various regions it has even lowered the cost of delivering supplies of fuel, sand and cement etc., as compared with that of hiring transport. While there are not precise data on this subject, the evidence suggests that there is an overall reduction in cost and a more rapid delivery of materials to the job-site. Both of these reduce the delays in system construction.

The ability of the promoters assigned to the six provinces of the Project to visit field sites has been significantly increased with the assignment of motorcycles. Prior to the Project the promoters had to depend on whatever IEOS transportation was available and share it with others going to the same area, or take public transportation. The motorcycles, which are maintained by the rider, permit the promoters to have more contact with the community.

6.3 Problem Areas

6.3.1 Delivery of Vehicles

In Table 6.3 one can see the relationship between the earliest date for starting the field projects and the arrival of the first vehicles in the provinces. The first activities were studies, designs, organization of the community and acquisition of materials. It is estimated that these activities usually take about three months. From Table 6.3 one can see that in all cases the work of the projects was started before the arrival of the vehicles.

In general, except for the Quimiag-Penipe Project, which is located in the AID/IRD/IEOS Area of Chimborazo, the projects have not experienced substantial delays due to late delivery of the first vehicles. But, in a few isolated cases, the late delivery has caused delays in system construction, for example in the case of the delivery of the dump truck to Esmeraldas in February of 1984.

Conclusion: In future projects the transportation element should be timed to be available nearer to the start of the project. If this cannot be done, funds should be made available for the hiring of transportation during the data collection and design phases. This will permit the agency to carry out these preliminary phases without undue delays.

Table 6.3

Dates of Project Starts and Commodities Delivery

Province	Project Start Date	Date of Delivery for Pick-ups or Trucks	Type of Project
CHIMBORAZO	June 82 February 83	February 83	AID/IRD/IEOS AID/IEOS
TUNGURAHUA	February 83	March 83	AID/IEOS
COTOPAXI	August 82 November 82	February 83	AID/IRD/IEOS AID/IEOS
ESMERALDAS	January 83	February 83	AID/IEOS
MANABI	August 82 January 83	February 83	AID/IRD/IEOS AID/IEOS
LOS RIOS	June 83	March 83	AID/IEOS

6.3.2 Mobile Maintenance Units

The objective of forming mobile maintenance units in the six provinces of the Project has not been achieved because the vehicles for this element have not been built and/or equipped. The units received for this effort have almost the same characteristics as the pick-ups that were provided for supervision. IEOS plans to prepare the vehicles to transport the tools and materials for routine and preventive maintenance of systems. But, while they are waiting to implement the decision, the vehicles are being used in the IEOS provincial offices for general supervision of work.

Conclusion: AID and IEOS should review the project element of the mobile maintenance units and decide how this element will be conducted. Once a decision has been reached, a decision should be made to use the pick-ups as planned for the mobile maintenance units or for use by supervisory personnel.

6.3.3 Vehicle Maintenance

Table 6.4 details some of the small problems that have been reported in relation to the vehicles received by the Project.

Table 6.4

Problems Reported with Vehicles

TYPE OF VEHICLE	REPORTED PROBLEMS	REPORTED EFFORT
Dump Trucks	Front tire size 750-20 Rear tire size 900-20	Possible damage of the steering system
Pick-up Trucks	Inadequate tires for rural areas Weak rear suspension	Tires often flat Low carrying capacity

Apparently, there is a lack of understanding regarding the cargo capacity of the pick-ups as it relates to the space or volume available. The cargo is sometimes too heavy for the space available and loading heavy material has resulted in overloading and bottoming-out of the pickups when they are used to transport certain types of materials or people. This practice, if continued, can result in damage to the vehicles.

The only major equipment problem experienced to date is that the dump truck at Chinborazo's Provincial Office broke an axle after only some 25,000 kms. This occurred during transport of materials to the Quimiag-Penipe IRD. The repair is being delayed because spare parts are not available in country.

Conclusion: The Project should be careful to instruct drivers on the proper load limits for each type of vehicle and conduct periodic courses on how to use and maintain the equipment.

Apart from these small problems, the fleet of vehicles is providing positive benefits for the project.

6.3.4 Millipore Equipment

In reviewing the records the team found that only a few of the promoters have been trained to perform bacteriological tests using the Millipore equipment. As a result of the course the promoters are carrying out tests as they are deemed necessary, but without following any defined program. The promoters have not been trained to use the other equipment that was provided, such as transits and water testing equipment.

Conclusion: IEOS should be assisted to establish a continuous training effort in the area of water quality and bacteriological testing so that promoters will know why and how to use the materials being provided.

6.3.5 Other Equipment Needed

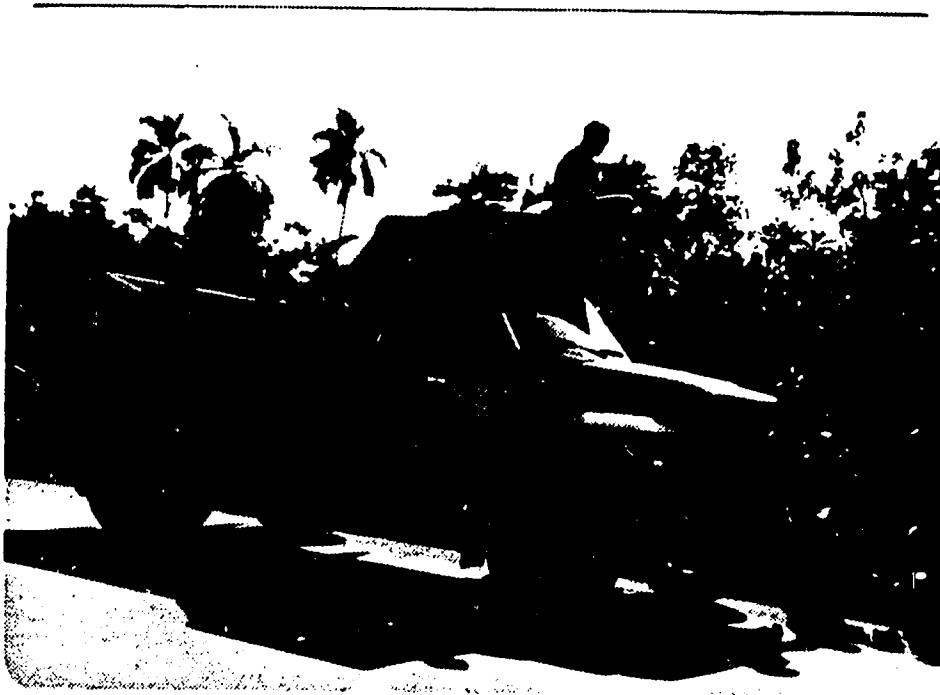
From the field visits the team observes that two additional equipment items are needed.

1. High quality plumber's equipment and tools in order that new house connections could be made with a minimum of delays since not all house connections are made at the time of system construction.
2. Topographical and surveying equipment for paraprofessionals/promoters in the six provinces of the Project so that new systems can be surveyed and constructed in the shortest time possible.

6.4 Suggestions for Improvements

In examining the vehicles and equipment that had been provided, the team felt that the following action would improve the ability of the Project to make use of these materials.

- Prepare an operation and maintenance manual, based on the manufacturer's service manual, for each type of vehicle provided to IEOS and develop a continuous in-service training effort for performing preventive and routine maintenance.



A dump truck provided by the Project
to IEOS to help improve delivery of
construction materials

Chapter 7

RECOMMENDATIONS

7.1 A Time to Reflect

This evaluation should be thought of as a moment of reflection on what has been done and where to go next.

To the team it is clear that a base has been established, and that the Project now has experience with several different institutional schemes. Thus, the first of the basic objectives of the Project has been achieved and now is the time to reflect on the next step, which is the design of institutional arrangements that will allow IEOS to be a strong and effective force in the area of planning, designing, building and backing up drinking water and basic sanitation schemes for the thousands of small villages and dispersed areas of Ecuador. In designing these institutional arrangements, the team feels that three elements are essential: 1) the participation of the community in all phases of the effort; 2) a constant seeking of methods, techniques and materials that will lower costs and/or expand coverage; and, last but not least, 3) the maximum use of paraprofessional personnel to expand the roles of the engineers, promoters and administrators.

The following recommendations are made to help the Project achieve these objectives.

7.2 Recommendations

The following sections present the team's major recommendations divided into the following five areas:

- General Aspects
- Institutional Aspects
- Operational Research
- Field Activities
- Community Participation

These summarize the ideas and suggestions presented in the "conclusion" sections of each of the previous chapters.

The 26 recommendations summarize the activities and actions that the team feels should be given priority attention if the Project is to achieve its goals. The team feels that without strong action in these areas it is very unlikely that the Project will be able to meet its goal of institutionalizing those procedures that will result in safe water and basic sanitation for the thousands of Ecuadorians who need them.

7.3 General Aspects

7.3.1 Mid-Project Meeting

From its visit to the various agencies involved with the Project visiting various communities in which systems had been built, the team found that there was not a uniform understanding of Project objectives. It found that even within different levels of the same agency there were different understandings of what the Project was trying to achieve. A common misconception was that many people thought it was a "consolidation" project, but in reality it was meant to investigate design and operationalize a structure within IEOS that would allow it to build low-cost rural water system and basic sanitation units that responded to local participation approaches.

Recommendation No. 1: AID should convene a mid-project meeting of SEDRI, IEOS, JRH officials from both the Central Office and provincial offices to discuss:

- Problems encountered to date in each institution
- Progress to date on model development efforts
- Progress to date on cost reduction efforts
- Planning for organizational relationships in the future
- Role of each institution once the RWSS system is operational.

7.3.2 Long-term Operation and Maintenance

The team found that the concept of giving operation and maintenance to the local system operation was in confusion because the planned maintenance units had not been established. It was found that the units that had been planned for this purpose were being used to expand the advisory capacity of the provincial offices. The team also found the lack of a clear-cut policy in the area of long-term operation and maintenance and written job descriptions for the various elements in the process. The lack of clear direction is of great concern to the team. In view of the number of systems that are being built, it is urgent that a clear-cut policy for long-term operation and maintenance and the corresponding job descriptions should be established as quickly as possible and that the remaining resources of the Project should be used to try out various approaches to this problem.

Recommendation No. 2: The Project needs to give a high priority to defining a policy for the operation and maintenance procedures that are to be followed once the proposed systems are constructed. The policy needs to define: 1) what will be the responsibilities and duties of the local operators; 2) what will be the role of each of the elements (i.e., paraprofessional, promoter, engineer, etc.) and levels (i.e., local, provincial, central, etc.); 3) how will each level be prepared for its functions; and 4) what types of long-term training mechanisms will need to be established to carry out the desired functions.

Recommendation No. 3: AID and IEOS should re-examine the concept of establishing a maintenance backup system at the provincial level using the mobile maintenance units called for in the Project Paper. Such a system must be designed to support and/or backup the local authorities in their operation and maintenance efforts. As a result of this re-examination by IEOS, the Project should prepare a maintenance plan that will use the pickups that have already been provided, or the Project should request USAID to drop the mobile maintenance van concept. To do this the Project must clearly define how local operators will be given operation and maintenance backup by the provincial and/or central levels of IEOS. For example, if the mobile van concept is dropped will the backup function be the responsibility of the promoters, the engineers or the paraprofessionals? Where will spare parts and materials be stored? In what quantities? What type of long-term training activities will be carried out to ensure that maintenance is done?

7.3.3 Water Quality

The team was pleased to observe the measures being followed to ensure the quality of the water being delivered (i.e., chlorination, sanitary protection and user education). It also took note of the fact that water quality efforts have not yet been fully institutionalized in the Project. For example, there has been only one workshop on the use of the Millipore kits. The team feels the area of water quality should be given continuous attention at a higher level of activity.

Recommendation No. 4: The team recommends that the Project should ensure that IEOS establishes a mechanism to take and test periodic bacteriological water samples and to report back results to the local health authorities .

Recommendation No. 5: The team recommends that the Project should develop a continuous series of water quality workshops and/or job aids to train promoters and inspectors (mainly at the Provincial level) in the techniques and procedures for water testing and the follow-up actions that must be taken when changes in water quality are found.

Recommendation No. 6: It is recommended that the objectives of the water quality effort should be: 1) periodic bacteriological testing; and 2) continuously conducted sanitary surveys as the minimum surveillance activity.

7.3.4 Commodities

From the visits to the field and from observing work conditions in the various units of the Project, the team feels that there is not a uniform understanding of the loads that can be carried by the trucks and pickups. It is felt that this lack of understanding could be the reason for some of the failures that

have been reported; for example, transmission problems and the need for limiting certain loads in the pickup. At the same time the team was pleased to find that in most cases the maintenance of the vehicles is carried out in accordance with a pre-established schedule for changing the filter, oil and spark plugs. The day-to-day operation of the vehicles, kilometers traveled, and maintenance are all recorded on an official form.

Recommendation No. 7: IEOS should establish procedures for ensuring that the drivers understand that vehicles should be loaded in relation to their weight capacity and not the volume available in the cargo area. A load chart should be placed in each driver area for ready reference.

7.4 Institutional Aspects

7.4.1 "Direccion" vs. "Unit"

During the second quarter of 1983, IEOS created the Direccion Nacional de Saneamiento Basico Rural in order to respond to the Conditions Precedent of the Loan/Grant Agreement. In creating this "Direccion," IEOS went beyond the intent of the agreement which only called for the "establishment of a 'Rural Water Supply and Sanitation Coordination Unit'" with a staff consisting of a chief, a deputy chief, an anthropologist, a health educator, and/or other professional personnel as well as secretarial and clerical personnel. Instead a "Direccion" was created.

While the establishment of the "Direccion" gave more stature to the area of rural drinking water and basic sanitation, it resulted in a loss of focus for Project activities. As originally designed, the intent of the "Unit" was to serve as a focal point through which Project activities would be channelled, focusing attention on Project actions at the national and provincial levels. With the establishment of the Direccion, the Project became only one of several actions that had to be carried out. For example, instead of having a clearly focused operation with one funding source -- A.I.D.--the Direccion has about six funding sources with which it must interact and respond to. IEOS staff have not been able to devote their full attention to the Project.

In the opinion of the team, one of the main problems resulting from this loss of focus has been the change of emphasis in the Project from developing a model to building systems. The team feels this shift imperils the development of the institutional model under which IEOS will be able to design, build and backup the thousands of small drinking water and basic sanitation systems that the country will need if it is to reach its Decade goal.

Recommendation No. 8: Within the Direccion of Basic Rural Sanitation, IEOS should organize a "Small Village Drinking Water and Basic Sanitation Unit" (SVDWBS). The staff of the SVDWBS Unit, while part of the Direccion, would be a Task Group exclusively dedicated to the work of the Project. Similar Task Groups would have to be formed at the provincial level. The objective of the task group would be to evaluate the experience to date, and then develop a coordinated set of criteria, manuals and instructions for the

institutional model that IEOS should follow in the future. Day-to-day construction matters would be handled by the Direccion staff. The members of the unit at the national and provincial levels would serve as the core group for integrating the proposed scheme into IEOS once the Project is over.

7.4.2 Decentralization

The team was pleased to find the high levels of interest in and capability for carrying out the work of the project that was evidenced in the provincial offices. It was also pleased to note the awareness in the provincial offices that if IEOS is to meet the goals of the International Drinking Water Supply and Sanitation Decade, a large degree of flexibility will have to be given to the provincial offices. The team found that at the present time many measures (such as designing simple water systems, contracting out civil works) were being carried out in varying degrees in the provincial offices. This trend needs to be strengthened and focused into the project objectives.

Recommendation No. 9: The Project should concentrate its future efforts to assist IEOS in decentralizing, so that the activities are at the provincial level in the following functions: 1) developing system designs using paraprofessionals to do groups of villages under an engineer's supervision; 2) contracting out the civil works in groups of villages to one contractor; and, 3) conducting training efforts for village juntas/operators in administration, operation and maintenance techniques.

7.4.3 Training

As part of the efforts, the Project has conducted a limited number of training activities (courses, workshops, seminars, and in-service training) at both the national and provincial level. These efforts have not been conducted under an overall plan that sought to support specific project objectives such as developing IEOS' paraprofessional capability; developing IEOS' capacity in such diverse areas as community participation, project/program management, user education, training system operators, and utilization of simplified/low-cost technologies; developing IEOS' capability to install handpumps; and developing IEOS' capability to conduct training as a continuous long-term institutional element.

Recommendation No. 10: Based on the experience to date the Project should: 1) conduct a review of the efforts (such as workshops, in-service courses, and seminars) expended for training and then determine the areas yet to be covered; 2) develop a long-term continuous training plan for the Project; 3) request the services of a professional to help evaluate the training efforts to date and oversee the implementation of a comprehensive training program which would include long-term training for paraprofessionals; and 4) consider using a limited number of fellowships for groups of

paraprofessionals, engineers and administrators (mainly from the provincial offices) to observe RWSS programs in other countries. This should be done as a carefully planned and organized program rather than on an individual ad hoc basis.

7.5 Operational Research

7.5.1 Low Cost Technologies

The team felt that the investigation and integration of low-cost simplified technologies into the daily efforts of the Project had not been given the priority that it deserved during the first two years of the Project. The team felt that greater attention needed to be given in the future to identifying and institutionalizing such cost reduction concepts as contracting of groups of civil works by the provincial offices and use of promoters as "paraprofessionals" for data gathering, simple designs and construction inspection.

Recommendation No. 11: AID should help focus IEOS' attention into national and provincial level activities that seek out and clearly identify such cost-saving techniques, equipment and/or activities as could be tried out as a Project activity. Each idea, concept and/or approach should be reviewed by a joint IEOS/AID committee to find those that will: 1) have the highest cost reduction impact; 2) make the greatest use of currently available human and technical resources; and 3) require the lowest investment of time and money. Those passing the committee should be field tested. Once tested, the concept should be disseminated throughout the Direccion for incorporation into the day-to-day work. The goal of this effort should be to establish a series of successful cost reduction measures.

7.5.2 Hardware

The Project contemplates the development and/or testing of a number of devices such as robovalves, AID-type handpumps, household water filters and water seal latrines. Of those tried to date the most successful have been the locally manufactured water seal latrines. Limited field tests show that the locally-manufactured hand pumps have great possibilities if current quality control measures are maintained and local maintenance capacity is established at each pump installation. The other devices are still in various stages of development and none are near to being operational.

Recommendation 12: The Project should review the various devices being considered and give priority attention to a limited number of them. The selection of the devices to be chosen should be based on:

- Increase of user convenience
- Impact on user's personal hygiene habits

- Progress made on current local manufacturing efforts
- Cost of support/maintenance mechanism in money and person-power.

These criteria would tend to indicate that the Project should increase its handpump and household water filter efforts.

7.6 Field Activities

7.6.1 Water Systems

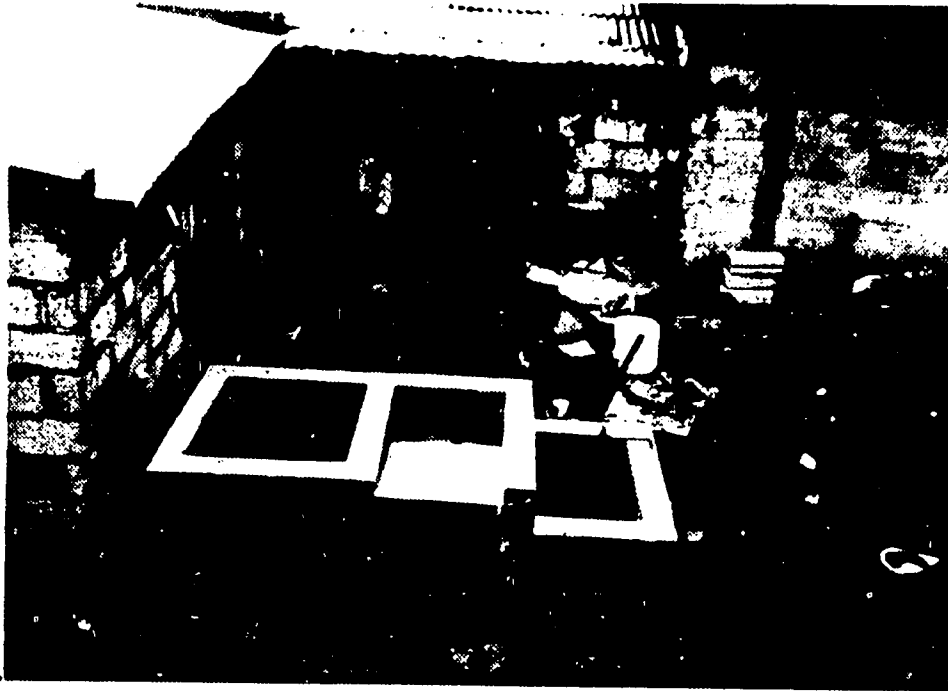
During its field visits the team observed the following types of project activities: water systems fed by gravity or mechanical pumps, handpump installations, and various types of latrines (pour-flush and dry). It was observed that the technologies employed in the Project are basically the same as those used by IEOS in their regular programs. In addition, it was noted that the construction approaches being used are not meeting the standards called for in the original project planning.

Recommendation 13: The team feels that the AID sanitary engineer should assist IEOS to examine and reorient the construction phase of the Project so that system delivery rates will allow for meeting project goals. The areas that should be examined are: greater use of paraprofessionals and/or promoters; greater use of contracts for civil works; development of a material purchasing system that will allow for warehousing quantities of materials vs. the current method of system purchasing.

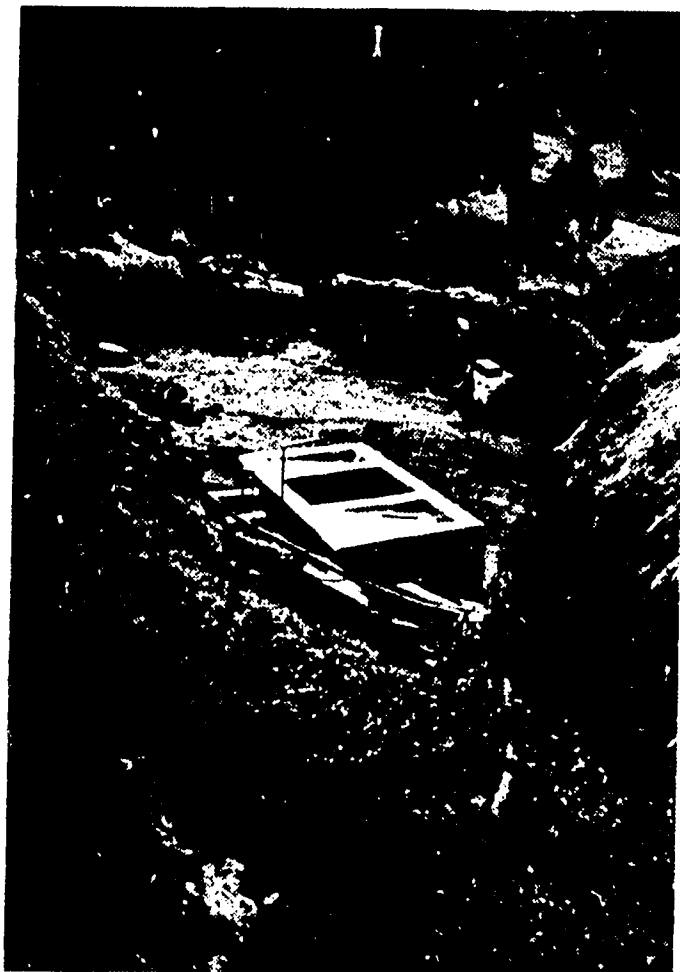
Recommendation 14: The team feels that the Project should develop a mid-term workshop for provincial engineers and promoters to 1) examine experience to date, 2) develop plans for accelerating current construction rates, and 3) develop plans for institutionalizing the long-term operation and maintenance needs of IEOS in this area. An outside consultant should be used to serve as a catalyst for this effort.

Recommendation 15: In view of the rising cost of the meters that are currently being used to control waste, IEOS should examine alternative methods of controlling wastage. The team suggests that greater attention should be given to user education techniques and approaches to prevent water loss and/or misuse.

Recommendation 16: The team recommends that in order to obtain and maintain the highest quality of water for the user, IEOS should develop a drinking water sampling program using the bacteriological test equipment that has been



Typical laundry facilities built by user



delivered to the provincial offices. This effort should be coupled with a continuous program of sanitary surveys conducted by the promoters.

Recommendation 17: The team recommends that IEOS should re-examine the legislation concerning the use of contracts for the civil works (i.e., storage tanks, pump stations, etc.) in the project systems, especially where the use of skilled labor is required.

7.6.2 Latrines

The team noted that a substantial number of latrines had stopped being used a short time after their construction. This is because many were poorly placed in relation to water for flushing and/or located down a steep hill from the user's house.

The team was pleased to note that most of the latrines were a locally manufactured pour-flush type latrine that was constructed so that it could be upgraded to have a water tank for flushing.

Recommendation 18: The Project should make a survey of latrine usage for such factors as: 1) nearness to water source for flushing and hand washing; 2) nearness to house; and 3) elevation up or down from the user's house, and use this information to develop criteria for future type and location of latrines.

Recommendation 19: The Project should work with the local manufacturer to improve the finish so that it will be less pervious and much smoother. These steps would help to reduce odors.

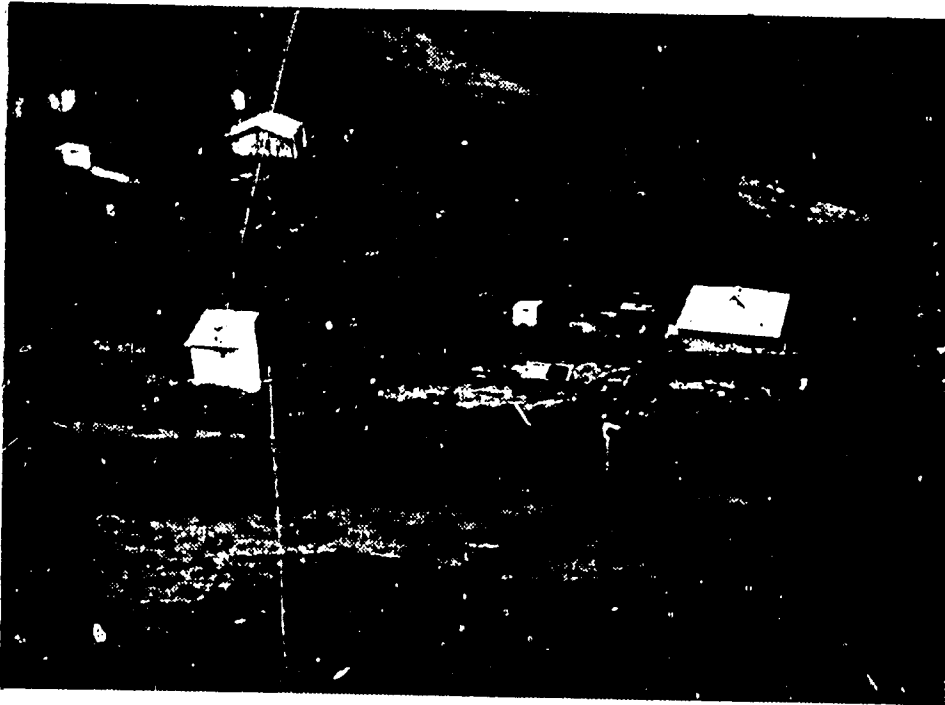
Recommendation 20: The Project should study the consequences (e.g., greater water usage) and impact of adding a water flush tank to the current pour-flush toilet.

7.6.3 Maintenance

One of the major objectives of the Project is the development of the local capability for operating and maintaining the water and sanitation systems installed. As simple as these systems are, the junta (or the users in the case of a handpump and latrine) must be made aware of the need for regular and preventive maintenance. IEOS must realize that as the number of systems increase in number and complexity there will be increased demands on their limited resources to: 1) insure that village operators are trained; and 2) provide assistance/advice to the junta when they experience failures that are beyond local capacity.

Recommendation No. 21: The Project should review the short and long-term need for the mobile maintenance vans. If it is decided not to place them in service, the Project should

Examples of Poor Latrine Location



Long distance of latrine from house and water (for pour-flush) makes latrine inconvenient to use, hence it remains unused.



Steep climb makes latrine inconvenient to use.

ensure that: 1) the paraprofessionals and promoters are given training in simple repair techniques; and 2) there is a provincial level capacity for assisting the village operator where there is a problem that exceeds the capability of the operator or the promoter to solve.

Recommendation No. 22: The Project should ensure that IEOS establishes a unit for training village juntas and operators in system operation and maintenance. This effort should involve an on-going series of in-service courses for groups of villages and should have periodic refreshers at which new materials would be introduced.

7.7 Community Participation

7.7.1 Continuous Promotion

As a result of its field observations and interviews with IEOS, SEDRI and USAID staff, the team feels that the Project needs more work to institutionalize the element of community participation as a long-term program in the various phases of each system (i.e., identification, design, construction and operation.)

Recommendation No. 23: The team recommends that the Project work more closely with IEOS to 1) identify those techniques that have resulted in high degrees of community participation and/or stronger juntas and 2) find ways to institutionalize the more successful approaches.

7.7.2 System Coverage

The team observed that in various cases the water and/or sanitation coverage is not complete because some of the villagers had not completed the "Mingos" necessary to receive a house connection and a latrine at the time of system startup. The team feels that the percentage of users not covered by these basic services is too high, and that this lack of coverage will adversely affect the Project's efforts to improve the overall health of those in the project area.

Recommendation 24: The Project should have a consultant help IEOS develop innovative financing schemes that will allow all the potential users of a system to be able to connect at the time of startup. For example, a small revolving fund for house connections could be financed. Such efforts should take into account the limited financial measures of each family vs the need to have the broadest possible coverage in the shortest time. During the remaining period of the Project, IEOS should try out and then institutionalize those schemes that will increase coverage.

7.7.3 User Education

Implicit in the objectives of the Project is the mandate that once a system (water, latrine or handpump) is built it will be kept functioning. In addition, there is a second assumption: the system will be utilized. To ensure that this happens, it is necessary that the user be educated in the reasons for using and caring for the system. Thus, user education in personal hygiene and water usage are key elements in achieving the objectives of the Project. It is clear that if the expected benefits are to follow from the system being built, IEOS must ensure that systems always are functioning and that they are utilized.

Recommendation No. 25: IEOS should design and conduct a continuous program for teaching the individual users the elements of personal hygiene and individual system maintenance. This effort should make maximum use of audiovisual, radio and TV techniques and channels.

Recommendation No. 26: While the prevention of unnecessary loss or excessive water usage is one of the goals of IEOS' using a water meter, the team feels that the cost of this solution is reducing the number of systems that can be built. The team recommends that IEOS consider assigning one promoter in each province as a waste control expert. This person, who will be paid for out of the funds saved by not installing meters, would be responsible for working with the junta to prevent leaks and excessive usage. Such a person would make maximum use of simple communication techniques such as radio, plays, and graphics.

APPENDIX A
Project Description

ANNEX 1

PROJECT DESCRIPTION

I. Project Goal, Purpose and Strategy

The project's over-all goal is to improve the health of Ecuador's rural poor. The purpose of the project is to develop a model for a low cost health care delivery system which will be implemented in three Integrated Rural Development Projects and which can be replicated on a nation-wide basis. The model will be based on an area (sub-provincial) integrated services delivery system supported by a strengthened institutional capacity at the provincial and national levels. Specifically it will:

- Improve existing health services delivery and provide new, integrated health services in high priority rural areas.
- Improve the utilization of lower cost primary health care services through promotion and through increased demand.
- Rationalize health service delivery by coordinating efforts of health services institutions within geographic areas.
- Facilitate extension of rural water and sanitation services through the use of appropriate low cost technologies.
- Incorporate nutrition concerns in health program design and implementation.
- Decentralize decision-making responsibility for health programs and facilitate community participation in the decision making and implementation process.

At the area level, the model consists of four major elements:

- (1) Creation of a new area level of health management which will result in the posting of an area health chief (coordinator) who will be responsible for managing health activities in his area in close technical and administrative coordination with the respective IRD Project Implementation Unit.

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- (2) Expanded Primary Care with emphasis on priority programs which have increased community participation in the design and delivery of services and which utilize community based paramedical personnel.
- (3) Water supply and sanitation projects which extend coverage to the population not currently covered.
- (4) Nutrition activities designed to carry out effective supplementary feeding programs and activities to increase the availability of basic foods.

The project strategy is to support the development and implementation of the model of the integrated rural health delivery system by: strengthening the capabilities of Ecuadorean governmental institutions to plan, manage, support and replicate the model at the area, provincial and national level and to carry out primary health care, including water supply/sanitation and nutrition improvement activities in three Integrated Rural Development (IRD) projects, Quimiag-Penipe, Salcedo and Jipijapa.

II. Project Implementation Arrangements

The following Ecuadorian government institutions will implement project activities: The National Health Council (NHC), Ministry of Public Health (MOH), Ecuadorian Institute of Sanitary Works (IEOS) and the Integrated Rural Development Secretariat (IRDS).

Those project activities which are intended to strengthen the capabilities of the Ecuadorian institutions to implement the integrated rural health delivery system will be administered directly by each of the institutions involved. The studies and activities related to the field demonstration projects will be coordinated by the IRDS and will be implemented jointly by the Project Implementation Units, the MOH and IEOS in conformity with interinstitutional accords between the IRDS and the implementing institutions. The precise role and responsibilities of the area health chiefs as well as their relationship to the IRD project executing units will be defined in the operating manual jointly developed by the MOH and the IRDS.

Loan and Grant funds as well as national counterpart funds for institutional strengthening will be assigned directly to each institution in accordance with Part A of the financial plan contained in Table 1 of this Annex.

Funding for the field activities, in accordance with Parts B and C of the financial plan, including loan and national counterpart funds, will be channelled through the IRDS to implementing institutions in accordance with the interinstitutional accords established between the Integrated Rural Development Secretariat and each implementing institution and in accordance with the regulations of the National Integrated Rural Development Fund (FORADRI).

III. Project Activities

A. Institutional-Strengthening Activities

1. NHC

This component of the project will permit the NHC to augment the availability of studies and current information which will facilitate the establishment of national health policies and the coordination of interinstitutional health programs by implementing specialized studies and developing seminars and workshops.

a. Studies

The NHC will carry out several studies and analyses related to key health policy concerns. Possible studies might include (1) the implications of the planned extension of coverage of the Instituto Ecuatoriano de Seguro Social (IESS) including the Seguro Campesino program, the extension of medical services to new affiliates, and the incorporation of new groups of beneficiaries, (2) the feasibility of developing a national drug supply system, and (3) adequate user charges for primary health care and potable water services, and (4) the feasibility of developing and organizing a National Health System. These studies will be carried out by the Borrower's direct hire and/or contract personnel. The NHC will also assure that the low cost primary health care, water and sanitation technologies are properly evaluated.

Loan funds will partially finance local costs of studies including local contractors. Grant funds will finance short-term technical specialists while the Ecuadorian contribution will be in the form of professional, secretarial and clerical support as well as some operational costs of the studies.

b. Seminars and Workshops

The NHC will sponsor seminars and workshops for the faculties of Ecuador's State medical schools and senior officials of the MOH, IEOS and the IESS which will analyze priority health issues and identify appropriate ways to address them. Grant funds will finance the participation of experts in the seminars and workshops as well as observational visits to health planning and primary health care activities in other countries.

Loan funds will partially finance local costs of the seminars and workshops. The Borrower will provide management and logistical support for the seminars and workshops.

c. NHC Support

The operations of the NHC will be supported by loan funds which will finance office equipment and by a Borrower counterpart contribution to finance supplies, materials, equipment and office space.

2. MOH

This component of the Project will support the implementation of the Integrated Rural Health Delivery System model at the area (micro-regional), provincial and national levels.

a. Implementation of Model

The area health delivery system model will be established in the Salcedo, Quimiag-Penipe, and Jipijapa IRD projects. An area health chief will be appointed by the MOH in each location and will be responsible for the following health activities in these areas: (1) Formulation, implementation and control of health plans and programs, including budget, according to the annual operating plans; (2) administration of training courses and implementation of the continuing Medical Education program; (3) development and organization of general, financial and personnel administration programs, according to the norms established for the System; (4) development, organization and administration of the sub-systems for information, supervision, investigation, logistical supply, referral-counter-referral, medical audit and other technical-administrative activities necessary to develop the model; and (5) coordination of activities with the Implementation Unit of the corresponding IRD Project.

The area chiefs will depend administratively on their respective Provincial Health Directors who will supervise, evaluate, and provide technical, logistical and administrative support to the area chiefs. Also, the area chiefs will jointly formulate operational plans, make decisions about program implementation and exercise fiscal control with the Project Implementation Units; these Implementation Units will supply physical plant, and logistical and administrative support to the area chiefs.

The MOH will undertake the legal and technical-administrative actions which permit the decentralization and delegation of functions to the area chiefs so that they can carry out their activities with sufficient authority and responsibility.

Grant funds will provide approximately twelve months of external technical assistance to support development, implementation and evaluation of the area model.

Loan funds will finance contracts and related costs (e.g. per diem) for area chiefs during the initial years of the project on a declining basis, as well as the procurement of vehicles and equipment. Borrower funds will cover area chiefs' salaries and related costs on a gradually increasing basis, social benefits payments and vehicle operation and maintenance costs.

b. Training

(1). Area Level

Significant training of area personnel will be carried out as part of the project. At least three area chiefs will receive training at the Universidad del Valle in Cali, Colombia. Approximately thirty doctors, nurses and nurse midwives serving in the Quimiag-Penipe, Salcedo and Jipijapa IRD areas and provincial level supervisory personnel will receive practical short-term training in all aspects of maternal and child health while approximately thirty auxiliary nurses will receive additional training in rural health care; ten new auxiliary nurses will receive formal training. Loan funds will finance the participation costs of MOH personnel at these courses. Grant funds will finance consulting services for curriculum development and course evaluation. Borrower funding will cover materials preparation costs and salaries of trainees and trainers.

(2). Province Level

Provincial level management and planning capacity will be enhanced through training of provincial level personnel. The training programs will include out-of-country and in-country management training for the provincial health chiefs of Chimborazo, Cotopaxi, Manabi and three additional provinces as well as short courses which emphasize administrative skills for other provincial level personnel from Cotopaxi, Chimborazo and Manabi.

Loan funds will finance out-of-country training costs and subsistence costs for in-country training. Grant funds will finance consulting services to design and conduct in-country training. The Borrower will finance costs of Ecuadorian training personnel, training materials, and participant salaries during training.

(3). National Level

Advanced training in health planning and management will be provided. Approximately six employees of the MOH and two members of National Universities' medical faculties will receive masters level training abroad. Also executive seminars on health planning and management will be conducted by the Universidad del Valle in Colombia and in Quito with the participation of public sector officials and university medical faculty members. Loan funds will finance the external training while Borrower counterpart funds will cover participant salaries and local logistical support.

3. IEOS

This component will assist IEOS to augment its capacity to implement rural water and sanitation projects and will improve IEOS' capacity to test and apply appropriate and/or low cost rural water and sanitation technologies. An improved institutional capacity to implement rural water and sanitation activities will be obtained (1) through the creation of a national Rural Water and Sanitation Coordination Unit and (2) by shifting much of the responsibility for the design, implementation and maintenance of rural water supply and sanitation projects to strengthened provincial directorates.

a. National Level Activities

The major activities to be undertaken at the

national level are the institutionalization of the Rural Water Supply and Sanitation Coordination Unit, and the implementation of a training program.

(1) Rural Water Supply and Sanitation Coordination Unit

The Coordination Unit will coordinate the planning, design, and implementation of all rural water and sanitation programs. This unit, which will be attached to the Executive Director of IEOS, will expedite the design and implementation of rural programs through IEOS' existing structure. It will also coordinate studies and tests of alternative technologies and design modifications leading to cost reductions and will promote the adoption of appropriate norms, standards, designs and technologies which will reduce costs of rural water systems.

IEOS will staff the Coordination Unit adequately to carry out the project's objectives. It is expected that this staff will include a chief, a deputy chief, an anthropologist, a health educator, and/or other professional personnel as well as secretarial and clerical personnel.

A.I.D. financial support for the coordination unit will be primarily in the form of technical assistance, studies and equipment. Specific activities under the project include the execution of feasibility studies and field trials to test and evaluate specific low cost technologies (e.g. handpumps, robo-devices, purification devices, simple pour-flush toilets), to determine the technical and economic efficiency as well as their environmental and social acceptability.

Loan funds will finance local costs of the studies and field trials (materials, supplies, contracts for technical services and construction) and the acquisition of not more than five imported utility vehicles. Borrower counterpart funds will finance the operation of the Coordination Unit, including staff salaries, supplies, operating expenses, vehicle maintenance and per diem. Grant funds will finance short term consulting services of U.S. experts to assist in the design and execution of the studies and field evaluation of technologies.

In addition, A.I.D. will provide the services of a sanitary engineer experienced in rural water supply and sanitation programs for approximately thirty-six months at no cost to the Project. This advisor will work with IEOS to

promote the effective operation of the Coordination Unit. The advisor will also assist IEOS to develop and evaluate low per capita cost rural water and sanitation technologies, to promote the utilization of paraprofessional personnel in provincial offices, and to develop technical manuals and training programs related to the design, construction and maintenance of rural water systems. The chief of the Coordination Unit will be the counterpart to the advisor. IEOS will provide the advisor with an office and secretarial services. One of the utility vehicles will be assigned to the advisor on a full time basis.

(2) Training

Long term out-of-country and short term in-country training activities will be carried out. Long term training will consist of masters level education for approximately four professionals, which focuses on promotion, planning, design, construction and maintenance of low cost rural water supply and sanitation systems. Short term training will focus on improving the skills and performance of provincial level sanitary inspectors, health educators, promoters, engineers and water and sanitation system operators and administrative personnel; also, training will be provided to IEOS central headquarters staff and to representatives of other Borrower organizations and private voluntary organizations as appropriate. Short term training will focus on topics such as project administration, community motivation and the utilization of low cost water and sanitation technologies.

Loan funds will be used for long term out-of-country training costs and to assist IEOS to increase its training capacity in water and sanitation by financing health and sanitation experts, preferably Ecuadorians (individuals and institutions), audiovisual equipment and training materials, and by covering local costs of training such as transportation to the training sites and per diem while in training. Grant funds will finance short term U.S. consultants (individuals or institutions) to assist IEOS to identify specific training requirements, to develop training plans and to design and test training courses. The Borrower counterpart will cover salaries of IEOS training personnel and participants while in training, provision of classroom facilities and training materials, and a contribution to the in-country training fund.

b. Provincial Level Activities

The capability of the provincial offices of IEOS

in Cotopaxi, Chimborazo, and Manabi provinces to design, construct, and maintain rural water systems will be increased through the provision of paraprofessional staff, maintenance units, and vehicles and equipment. Each of these elements will be implemented in the IRD projects on a priority basis in one or more of the three provinces in order to test the feasibility of their future implementation on a national scale.

(1) Paraprofessional Personnel

In order to reduce costs of rural water and sanitation projects paraprofessional personnel will be utilized to carry out many simple design, promotion, inspection, and supervision tasks currently carried out by engineers. At least ten paraprofessionals will receive intensive training under the project in the design, construction and maintenance of low cost rural water and sanitation systems. These paraprofessionals will be incorporated into IEOS provincial directorates, IRD Project Implementation Units or regional governmental organizations which deal with rural water and sanitation in Chimborazo, Cotopaxi and Manabi provinces.

(2) Maintenance Units

Maintenance units will be established in Chimborazo, Cotopaxi and Manabi provinces to work with local Juntas de Agua and the organizations involved in rural water supply in close coordination with the IRD Project Implementation Units, to perform both routine and preventative maintenance of rural water systems, including hand pumps. Each of these maintenance units will be staffed by a mechanic and a mechanic's helper who will be provided with an equipped mobile van.

(3) Logistical Support

The project will provide logistical support to assure the efficient operation of IEOS provincial directorates in Chimborazo, Cotopaxi and Manabi. Vehicles, including motorcycles for paraprofessionals, vans for maintenance units, pick-up trucks assigned to personnel working in IRD project areas and cargo trucks as well as topographic, drafting, water-testing, maintenance and audiovisual equipment will also be procured.

The loan will be used to finance the purchase of provincial vehicles and equipment. Grant funds will finance

third country training for at least ten paraprofessionals. Borrower counterpart funds will finance salary and related costs of paraprofessional and maintenance personnel, vehicle operation and maintenance costs.

B. Coordination, Investigation, and Technology Promotion Activities

1. IRDS

a. Food Policy Studies

The IRDS will establish a task force on nutrition policy and will enter into agreements with Ecuadorian research institutions and/or individuals to design and conduct studies of the relationships between production, distribution and consumption patterns and nutrition in the three IRD projects.

Loan funds will finance local costs of the studies while Grant funds will finance consulting services. Grant funds will also finance in-country and out-of-country training for personnel connected with Integrated Rural Development Projects related to the nutritional aspects of rural development in an amount not exceeding \$25,000. The Borrower will finance salaries and related costs of task force members and office space and logistical support for consultants.

b. Promotion of Low Cost Technologies

In order to rapidly disseminate low cost rural health, food production, water and sanitation technologies, loan funds will be available to finance procurement of designs or devices which may be used in other Integrated Rural Development Project Areas. The Borrower counterpart will cover the costs of installation and operation of these technologies.

2. MOH

a. Bio-Medical, Social and Nutritional Studies

The MOH through the National Nutrition and Social Medicine Research (ININMS) in coordination with the Project Implementation Units will carry out studies in the three IRD projects to improve and update existing bio-medical, social and nutritional information. The studies will be financed with Loan, Grant and Borrower funds.

b. Operational Research

The MOH in coordination with the Project Implementation Units will carry out process evaluations on the implementation of the area model to determine the progress achieved in terms of the established objectives. These evaluations will be financed with Grant, Loan and Borrower funds.

c. Field Level Demonstration Activities

1. Primary Health Care (PHC)

This component will be implemented by the MOH in coordination with the Project Implementation Units. It will finance a variety of primary health care interventions designed to provide more effective health services, increase the demand for health services and increase meaningful community participation. Three types of activities will be financed: a) promotion of community based Primary Health Care Activities; b) priority primary care programs and c) provision of necessary primary care infrastructure. These activities will be managed by the area health chiefs designated in each of the three IRD areas in coordination with the Project Unit.

a. Promotion of Community Based PHC Activities

(1) Health Promoters

At least 30 health promoters will be trained and employed in the three IRD project areas. These promoters will be recruited from the communities in which they will work. They will provide health promotion and prevention as well as limited medical attention and first-aid and will promote referrals to higher level health facilities (i. e. posts, sub-centers). They will be administratively supervised and paid by their respective communities but will be technically supervised and resupplied by the MOH.

Loan funds will finance promoter training and, on a declining basis, a monthly grant from the MOH to local communities which will be used by the communities to remunerate promoters. The Borrower counterpart contribution will finance these community grants on an increasing basis, assuming all costs by the end of the project.

(2) Other Community Based Primary Health Care Activities

The project will support other community based activities such as the establishment of community operated botiquines, midwife training and support, and a pilot school health volunteer program. Loan funds will finance items such as training, minor construction, and equipment and supplies other than medicines for these activities. Borrower funds will finance the purchase of medicines, and some training costs and personnel costs.

b. Priority Primary Health Care Programs

Priority primary health care programs will be initiated or strengthened in the Salcedo, Quimiag-Penipe and Jipijapa IRD areas. These are expected to include diarrheal disease control, the expanded immunization program, goiter control and health education and will involve community participation.

For diarrheal disease control programs, loan funds will finance the purchase of oralyte, training and educational materials, training seminars and observational travel. Borrower counterpart will finance program supervision and logistical support.

For the immunization program, loan funds will finance procurement of equipment as well as training costs. The Borrower contribution will finance vaccines, salaries of program personnel and other logistical expenses.

A goiter control program will be carried out in the Quimiag-Penipe IRD project area. This is expected to include iodized oil injections to the at risk population as well as feasibility studies to identify economically, technically and culturally acceptable permanent solutions to this problem. Loan funds will finance direct costs of the mass vaccination campaign and studies. The Borrower contribution will finance salaries for program personnel and laboratory analyses.

An assistant health educator will be assigned at least part-time to each of the three IRD project areas to design and implement health education activities. Loan funds will finance vehicles, training equipment and supplies. The Borrower will directly finance the salary costs of the assistant health educators.

c. Health Infrastructure

Six health subcenters and seven health posts will be built in the three IRD project areas. These facilities and twelve other health posts located in multipurpose community centers will be furnished and equipped. A radio communication network between area chiefs, Project Implementation Units, hospital health centers, sub-centers, health posts, and health promoters will be developed on a pilot basis in one IRD area.

The loan will finance the construction of the health subcenter and health post structures, remodeling of training centers, radio equipment, and the furnishing and equipping of these facilities and of the twelve community center-health posts. The communities to be served by the health posts and subcenters will be responsible for finishing the construction and donation of land for construction sites. The Borrower, through the MOH budget, will finance the operation costs of the facilities and equipment and drugs used in the subcenters and posts.

2. Water Supply and Sanitation

The water supply and sanitation activities to be carried out under the project serve two purposes. First, they will provide a significant portion of the rural population in the Salcedo, Quimiag-Penipe and Jipijapa IRD areas with potable water and sanitation services. Second, they will test and promote the adoption of low cost technologies and system designs for rural water and sanitation systems.

Two types of water supplies, gravity flow aqueduct systems and shallow wells with handpumps, will be built.

a. Rural Water Supply Systems

In Salcedo and Quimiag-Penipe approximately twenty nine gravity fed systems will be built or rehabilitated. IEOS will be responsible for the technical administration of designs and will coordinate construction, including the contracting of specific tasks and procurement of non-local materials, for the water systems and wells. Communities will, however, participate extensively in the planning, construction, operation and maintenance of water systems. Each community in which a system is to be built will sign a formal agreement with the Project Implementation Unit prior to construction of the system.

b. Shallow Wells with Handpumps

In Jipijapa approximately 600 wells will be built while about seventy wells will be installed in the other two IRD Projects. In Jipijapa the installation program will be coordinated through the Junta de Recursos Hidraulicos de Jipijapa y Pajan and the IRD project unit while IEOS will provide technical support. Installation of wells may be carried out by the Junta de Recursos Hidraulicos as well as by private groups such as cooperatives.

Loan funds will be used to finance fifty percent of the total WS/S construction expenditures, while the Borrower counterpart will finance thirty percent of the total construction expenditures, including construction supervision. Beneficiary communities will contribute at least twenty percent of the cost in the form of labor and local materials contributions.

b. Excreta Disposal

The project will provide as many as 5,000 pit latrines and pour-flush toilets. Loan funds will finance material purchases; the Borrower will provide promoters and supervision; and communities will contribute local labor and materials for the walls of the structures.

3. Food and Nutrition Activities

This component will improve the effectiveness of supplementary feeding programs in the short term and will undertake pilot activities to evaluate the feasibility of producing within the community changes in consumption and food utilization practices directed at increasing the linkages between agricultural production and nutritional improvements. The first activity will be implemented by the MOH and the second by the IRDS through its Project Implementation Units.

a. MOH Maternal and Child Feeding Program Support

The operational efficiency of the Maternal and Child Supplementary Feeding Program in Cotopaxi, Chimborazo and Manabí provinces will be improved through intensive training in health education, program administration and logistics. Loan funds will finance curriculum development, preparation of training materials, and transportation and per diem of participants, while the Borrower will finance salaries of trainers and

participants, and construction/improvement of warehouses.

b. Pilot Food and Nutrition Field Activities

A variety of community based nutrition activities will be implemented on a pilot basis by the IRDS through its Project Implementation Units in the three IRD project areas. The precise definition of these activities will be based on the studies to be carried out by the IRDS (see Part B of this annex) and will be in accordance with the stipulations in Section 5.4 of the Loan and Grant Agreement. Possible studies might include research on the relationships between production, distribution and consumption patterns and nutrition in the three IRD Projects. Possible activities will include community managed outlets for basic foods, local food processing and storage centers, utilization of local agricultural production for school feeding and development of local weaning foods or other activities identified by the nutrition studies.

The loan will finance facility construction, equipment, and working capital. The Borrower will also contribute to a revolving credit fund and will finance supervisory and technical staff expenditures. Communities will carry out the construction activities, providing labor and land.

Table 1

FINANCIAL PLAN

(US \$000)

<u>Component</u>	A.I.D. Loan	Grant	Borrower of Ecuador	Total
<u>A. Institution Building Activities</u>	<u>1,575</u>	<u>475</u>	<u>2,100</u>	<u>4,150</u>
1. National Health Council	<u>100</u>	<u>140</u>	<u>160</u>	<u>400</u>
a. Studies	50	100	100	250
b. Seminars and Workshops	30	40	30	100
c. NHC Support	20	-	30	50
2. Ministry of Health	<u>525</u>	<u>135</u>	<u>540</u>	<u>1,200</u>
a. Area Level	330	100	350	780
(1) Implementation of Model	(185)	(80)	(245)	(510)
(2) Training	(145)	(20)	(105)	(270)
b. Provincial Level	50	35	50	135
c. National Level	145	-	140	285
3. Ecuadorean Institute of Sanitary Works	<u>950</u>	<u>200</u>	<u>1,400</u>	<u>2,550</u>
a. National Level Activities	610	125	710	1,445
b. Provincial Level Activities	340	75	690	1,105
<u>B. Coordination, Investigation, and Technology Promotion Activities</u>	<u>255</u>	<u>205</u>	<u>230</u>	<u>690</u>
1. Integrated Rural Development Secretariat	225	175	200	600
a. Food Policy Studies	100	175	125	400
b. Promotion of Low Cost Technologies	125	-	75	200
2. Ministry of Health	30	30	30	90
a. Bio-medical, Social and Nutritional Studies	15	15	15	45
b. Operational Research	15	15	15	45

FINANCIAL PLAN (CONTINUED)

(US \$000)

	A.I.D. Loan	Grant	Borrower of Ecuador	Total
C. <u>Field Demonstration Activities</u>	<u>3,570</u>	<u>-</u>	<u>4,130</u>	<u>7,700</u>
1. Primary Health Care (PHC)	<u>870</u>	<u>-</u>	<u>630</u>	<u>1,500</u>
a. Community Based Primary Health Care Activities	180	-	120	300
(1) Health Promoters	(120)	-	(100)	(220)
(2) Other Community Based PHC Activities	(60)	-	(20)	(80)
b. Priority Primary Health Care Programs	145	-	140	285
c. Health Infrastructure	545	-	370	915
2. Water Supply and Sanitation	<u>2,500</u>	<u>-</u>	<u>3,300</u>	<u>5,800</u>
a. Rural Water Supply Systems	1,170	-	1,170	2,340
b. Shallows with handpumps	680	-	680	1,360
c. Excreta Disposal	650	-	1,450	2,100
3. Nutrition Activities	<u>200</u>	<u>-</u>	<u>200</u>	<u>400</u>
a. MOH Maternal and Child Feeding Program Support	50	-	35	85
b. Pilot Nutrition Field Activities	150	-	165	315
C. <u>Contingencies</u>	<u>600</u>	<u>70</u>	<u>540</u>	<u>1,210</u>
TOTAL	<u>6,000</u>	<u>750</u>	<u>7,000</u>	<u>13,750</u>

APPENDIX B

Scope of Work
(Rural Water and Sanitation)

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Scope of Work for WASH Evaluation Team

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1. Inputs of Commodities

1.1 Assess overall effectiveness of logistics

1.1.1 Determine if vehicles and equipment that have been provided under the project are operating and being used effectively.

1.1.2 Determine if additional vehicles and equipment are needed.

2. Strengthening of Institutional Systems

2.1 Determine if IEOS capacity to implement rural WS&S projects at the national and provincial level (six provinces) is being increased.

2.2 Determine if IEOS is making progress in reducing the cost of its rural WS&S systems through the testing and application of new low-cost technologies.

2.3.1 Determine if its role should be strengthened.

2.3.2 Determine if new norms or standards leading to cost reductions have been promulgated.

2.3.3 Determine if any alternative water and sanitation technologies have been tested and what the results have been.

2.4 Describe and assess role of AID's sanitary engineer in the functioning of the unit.

2.5 Describe training provided to IEOS under the project.

2.5.1 Assess effectiveness of the training

2.5.2 Recommend advisability of other types of training

2.5.3 Assess whether IEOS' own training capacity has increased.

2.5.4 Determine what training IEOS has provided to any third parties and how it was received.

2.5.5 Describe what training materials have been provided under the project and if they have been effectively used.

2.6 Assess training of paraprofessionals under the project.

2.6.1 Determine how many have been trained.

2.6.2 Describe what paraprofessionals have been trained to do.

2.6.3 Assess the effectiveness (if they have assumed tasks previously done by engineers).

- 2.6.4 Determine if rural maintenance units have been established and assess if they are functioning effectively.
3. Outputs in terms of community water systems
 - 3.1 Assess gravity-fed water systems constructed under the project.
 - 3.1.1 Determine number of gravity-fed water systems constructed.
 - 3.1.2 Assess differences from systems constructed prior to the project.
 - 3.1.3 Assess costs compared to the costs of pre-project systems.
 - 3.2 Assess handpumps installed under the project
 - 3.2.1 Determine number of handpumps installed.
 - 3.2.2 Assess performance.
 - 3.2.3 Assess acceptance by the community.
 - 3.2.4 Assess acceptance by IEOS as an alternative technology.
 - 3.3 Assess latrines installed under the project.
 - 3.3.1 Determine number of latrines installed.
 - 3.3.2 Assess community acceptance.
 - 3.3.3 Describe health education activities.
4. Community Participation and Regional Institutional Arrangements.
 - 4.1 Describe and assess the effectiveness of community participation in planning, operation, and maintenance of systems constructed under the project.
 - 4.2 Assess inter-institutional arrangements in terms of project implementation.
 - Jipijapa
 - IEOS and SEDRI provincial relationships in Quimiag-Penipe and Salcedo
 - 4.2.1 Assess impact of additional funding on implementation in Quimiag-Penipe and Salcedo.
 - 4.2.2 Evaluate SEDRI and IEOS provincial coordination functions and divisions of responsibilities.
 - 4.2.3 Evaluate IEOS supervision and reimbursement procedures.

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FOR: S&T/M V. WENMAN; WASH D. DONALDSON

E.O. 12356: N/A
SUBJECT: WASH CONSULTANCY FOR EVALUATION OF PROJECT 516-0215

REF: (A) QUITO 0286; (B) FARR/WENMAN TELECOM 1/27/84

1. PRE REF (B) TELCOM, USAID UNDERSTANDS CENTRAL WASH PROJECT ABLE TO FUND TWO CONSULTANTS FOR SUBJECT EVALUATION, AS REQUESTED IN REF. (A). FURTHERMORE, WE UNDERSTAND DAVID DONALDSON WOULD ARRIVE OMA FEBRUARY 13 AND A HIGHLY QUALIFIED LOCAL SANITARY ENGINEER WOULD BE CONTRACTED BY WASH TO WORK WITH DONALDSON. BE ADVISED THAT INTEGRATED RURAL DEVELOPMENT SECRETARIAT PLANS TO CONTRACT LOCAL COUNTERPART PERSON TO WORK WITH WASH TEAM TO ADDRESS SPECIAL CONCERNS THE SECRETARIAT MAY HAVE.

2. SCOPE OF WORK. DETAILED SCOPE OF WORK FOLLOWS:

- A. IS IEOS' CAPACITY AT THE NATIONAL AND PROVINCIAL LEVEL (SIX PROVINCES) TO IMPLEMENT RURAL W/S PROJECTS BEING INCREASED
- B. IS IEOS MAKING PROGRESS IN REDUCING THE COST OF ITS RURAL W/S SYSTEMS THROUGH THE TESTING AND APPLICATION OF NEW LOW-COST TECHNOLOGIES
- C. IS THE RURAL WATER/SANITATION COORDINATION UNIT EFFECTIVELY COORDINATING THE PLANNING, DESIGN AND IMPLEMENTATION OF W/S PROJECTS NOW COULD/SHOULD ITS ROLE BE STRENGTHENED OR CHANGED HAS IT PROMULGATED ANY NEW NORMS OR STANDARDS LEADING TO COST REDUCTIONS HAS IT TESTED ANY ALTERNATIVE W/S TECHNOLOGIES (E.G., HAND PUMPS, ROBO DEVICES, POR-FLUSH TOILETS) WITH WHAT RESULTS
- D. WHAT ROLE HAS A.E.D.'S SANITARY ENGINEER PLAYED IN THE FUNCTIONING OF THE UNIT NOW COULD HIS ROLE BE MADE MORE EFFECTIVE.
- E. WHAT TYPE(S) OF TRAINING HAVE BEEN PROVIDED TO IEOS UNDER THE PROJECT, HAS IT BEEN EFFECTIVE, IS ANY OTHER TYPE OF TRAINING ADVISABLE, HAS IEOS' OWN TRAINING CAPACITY BEEN INCREASED, HAS IEOS PROVIDED TRAINING TO ANY THIRD PARTIES, HOW WAS IT RECEIVED, HAVE ANY TRAINING MATERIALS BEEN PROVIDED UNDER THE PROJECT, HAVE THEY BEEN EFFECTIVELY USED.
- F. HOW MANY PARAPROFESSIONALS HAVE BEEN TRAINED UNDER THE PROJECT WHAT HAVE THEY BEEN TRAINED TO DO ARE THEY DOING IT EFFECTIVELY ARE THEY ASSUMING TASKS PREVIOUSLY PERFORMED BY ENGINEERS IF NOT, WHY NOT HAVE RURAL MAINTENANCE UNITS BEEN ESTABLISHED IF NOT, WHY NOT? ARE THEY FUNCTIONING EFFECTIVELY; NOW COULD THEIR OPERATION BE IMPROVED

9. WHAT VEHICLES AND EQUIPMENT HAVE BEEN PROVIDED UNDER THE PROJECT ARE THEY OPERATING/BEING USED EFFECTIVELY? ARE ADDITIONAL VEHICLES, EQUIPMENT NEEDED?

GENERAL ASSESSMENT OF LOGISTICAL EFFECTIVENESS.

M. HOW MANY GRAVITY-FED WATER SYSTEMS HAVE BEEN/ARE BEING CONSTRUCTED UNDER THE PROJECT? HOW ARE THEY DIFFERENT FROM SYSTEMS CONSTRUCTED PRIOR TO THE PROJECT? HOW DO THEIR COSTS COMPARE TO THE COSTS OF PRE-PROJECT SYSTEMS?

I. HOW MANY HAND PUMPS HAVE BEEN INSTALLED UNDER THE PROJECT? ARE THEY PERFORMING SATISFACTORILY? ARE THEY WELL ACCEPTED BY THE COMMUNITY? IS IEOS ENTHUSIASTIC ABOUT HAND PUMPS AS AN ALTERNATIVE TECHNOLOGY?

J. HOW MANY LATRINES/POR FLUSH LATRINES HAVE BEEN INSTALLED UNDER THE PROJECT? ARE THEY ACCEPTED/USED BY THE COMMUNITY? HAS HEALTH EDUCATION BEEN PROVIDED TO COMMUNITIES INVOLVED IN THE PROJECT? WHAT FORM HAS THIS EDUCATION TAKEN? COULD IT BE IMPROVED?

K. HOW HAVE COMMUNITY MEMBERS PARTICIPATED IN THE PLANNING, CONSTRUCTION, OPERATION AND MAINTENANCE OF W/S SYSTEMS CONSTRUCTED UNDER THE PROJECT? HOW COULD SUCH PARTICIPATION BE INCREASED/IMPROVED?

1. ARE INTER-INSTITUTIONAL ARRANGEMENTS (ESPECIALLY IN THE JIPIJAPA RD AREA, BUT ALSO IEOS AND CEDRI PROVINCIAL RELATIONSHIPS IN QUMIAG-PENIPE AND SALCEDO) SUFFICIENTLY CONDUCIVE TO EXPEDITIOUS PROJECT IMPLEMENTATION? HAS ADDITIONAL FUNDING FOR CHIMBORZO AND COTACACHI AFFECTED IMPLEMENTATION IN QUMIAG-PENIPE AND SALCEDO NEGATIVELY? EVALUATE CEDRI AND IEOS PROVINCIAL COORDINATION FUNCTIONS, DIVISION OF RESPONSIBILITIES, IEOS SUPERVISION AND REIMBURSEMENT PROCEDURES.
3. ADVISE DONALDSON ETA AND LOGISTICAL SUPPORT NEEDED. MISSION EXPECTS TO PROVIDE FOR LOCAL (LAND) TRAVEL NEEDS OF WASH CONSULTANTS.
YOULE

*McJunkin
Austin
Witflew
Wenman
DWW*

*Received ST/H/WS (Wenman) 2-7-84
Passed to WASH 2-7-84*

APPENDIX C

Organization Chart and Reglamento for
National Direction for Basic Rural Sanitation
in IEOS

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A A Ing. Héctor Luzuriaga
DIRECTOR NACIONAL DE PLANIFICACION

DE: Ing. Mario Tobar *LT*
DIRECTOR NACIONAL SANEAMIENTO
BASICO RURAL

FECHA: 84-01-25

ASUNTO: Envío del Organigrama de la Dirección Na-
cional de Saneamiento Básico Rural

N°065-DNSDR-84

De acuerdo con las disposiciones pertinentes hemos proce-
dido a elaborar el Organigrama de la Dirección tal como
viene funcionando en la actualidad.

Cabe resaltar que éste difiere del Organigrama Oficial
del IEOS, pero es el reflejo de la forma en que estamos
trabajando a fin de ocupar al máximo el personal con que
contamos, además tampoco es una organización ideal que
como es nuestro compromiso trataremos de alcanzarla en lo
posible mediante el estudio correspondiente.

Merece especial atención el llenar el vacío que existe en
la División de Construcciones, de Supervisor de la Zona 1,
que al momento por este motivo casi está fuera de control.

Atentamente

Adj: Organigrama.

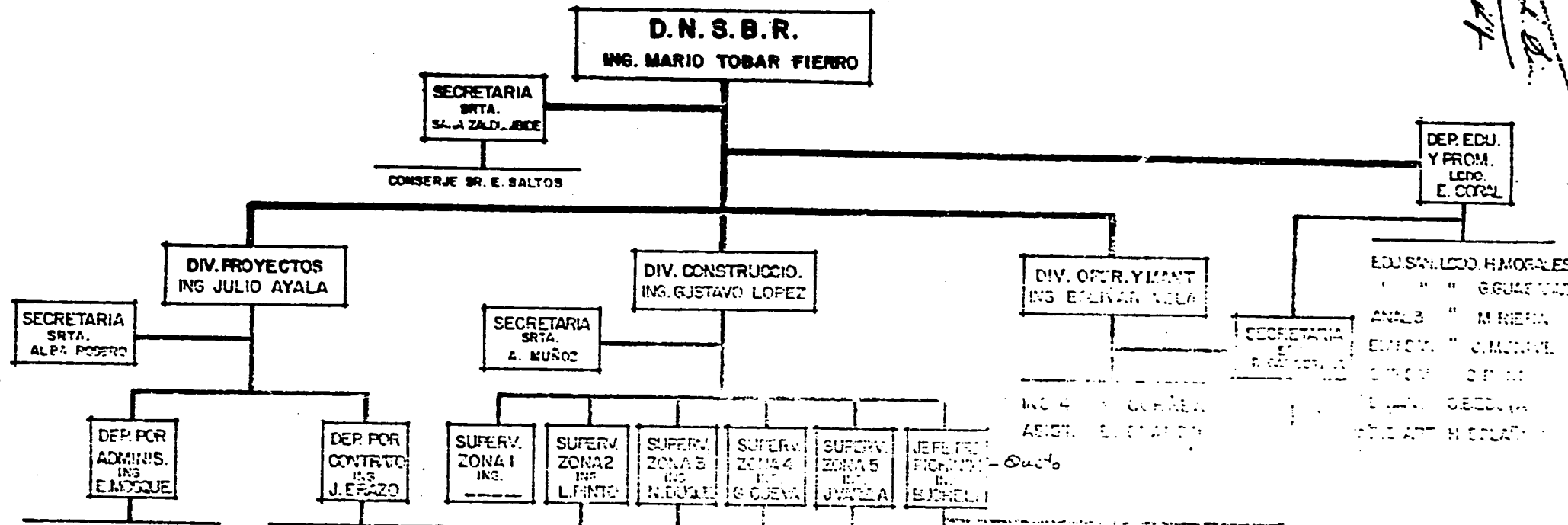
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Cc: Ings. Ayala, López, Vela, Ldo.Coral, Jefe de Personal.

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ORGANIGRAMA DE LA DIRECCION NACIONAL DE SANEAMIENTO BASICO RURAL

M. D.
1/1



-108-

- ING. 4. JOSE PINOS
- ING. 3. PATRICIO FIERRO
- ING. 3. FAUSTO CANDO
- ING. 2. OSWALDO PIEDRA
- ING. 1. P. FIGUEROA
- ASIST. F. MONTENEGRO
- c ASIST. E. MENDOZA
- AUX. JULIO SALINAS
- c AUX. CARLOS VACA
- AUX. J. MALDONADO
- c AUX. J. CARDENAS
- TOP. J. V. H. BALAREZO
- TOP. J. R. VELASTEGUI
- AUX. W. VALENCIA
- c AUX. G. CASTILLO
- c CHOFER W. JIMENEZ

- ING. 3. L. GONZALEZ
- c ASIST. C. GONZALEZ
- TOP. J. M. ALMEIDA

- c ASIST. R. NOBOA
- TOP. J. L. ENRIQUEZ
- c CHOFER O. ANDRADE
- c CHOFER D. BEDOYA

- c ASIST. M. CEVALLOS
- ING. 3. E. ACUÑA
- c ASIST. J. FERRER
- ASIST. A. RECALDE
- c PROM. C. VENTIMILLA
- c PROM. L. LOPEZ
- c PROM. J. BUSTE
- c PROM. MUÑOZ
- c CHOFER. A. SANCHEZ
- c CHOFER. H. HEREDIA
- c CHOFER. M. YEPEZ
- c PAGAD. L. JARAMILLO
- c SEC. N. ORDOÑEZ
- c COTIZ. I. MORA.

- ZONA 1 CAR, UMB, PICM, ESM. ...
- 2 COT, TUN, CHM, BOL. ...
- 3 CAÑ, AZY, MOR, GUA. ...
- 4 LQJ, JRO, ZAM, GAL. ...
- 5 MAN, RIO, NAP, PAS. ...

- b) Realizar actividades de investigación y desarrollo dentro del campo de la Química y Biología Sanitaria, tendientes a transferir tecnologías que convengan a los intereses de la Institución.

SECCION III

DE LA DIRECCION NACIONAL DE SANEAMIENTO BASICO RURAL

Art. 102. Es un órgano que tiene por objeto dirigir en el área de saneamiento básico rural, la realización de los proyectos destinados a la ejecución de nuevas obras básicas o ampliación de las existentes, ejecutar o fiscalizar la construcción de las mismas y supervisar la operación y mantenimiento de éstos una vez habilitados.

Art. 103. Son funciones de la Dirección Nacional de Saneamiento Básico Rural:

- a) Intervenir en la concepción general y básica de los proyectos y ocuparse de su ejecución;
- b) Elaborar especificaciones técnicas, presupuestos y términos de referencia, previo a su adjudicación;
- c) Ejecutar o fiscalizar la ejecución de las obras, promoviendo la racionalización y adopción de modernas técnicas de conducción, operación e inspección;
- d) Supervisar todo lo atinente a operación y mantenimiento de los sistemas, desde fuentes a obras de descarga, promoviendo la racionalización técnica y económica de los mismos, el incremento de sus rendimientos y la mejora de su organización; y
- e) Las demás que le asigne el Nivel Ejecutivo.

...

Art. 104. Esta Dirección está conformada por las Divisiones de: Estudios y Diseños, Construcciones, y Operación y Mantenimiento, y por el Departamento de Promoción y Educación.

PARAGRAFO I

DE LA DIVISION DE ESTUDIOS Y DISEÑOS

Art. 105. Es una Unidad que se encarga de realizar o fiscalizar los estudios de factibilidad y diseños definitivos para sistemas de: - agua potable, alcantarillado o disposición de excretas, para las zonas rurales.

Art. 106. Las funciones de esta División son las siguientes:

- a) Realizar las inspecciones preliminares requeridas, recopilando todos los datos necesarios, que permitan agilizar la ejecución de los diferentes proyectos;
- b) Supervisar los estudios y diseños que se realicen por administración directa, y fiscalizar los que efectúen por contrato; y
- c) Las demás que le asigne la Dirección Nacional de Saneamiento Básico Rural.

Art. 107. Esta División está conformada por los Departamentos de: Proyectos por administración y Proyectos por fiscalización.

DEL DEPARTAMENTO DE PROYECTOS POR ADMINISTRACION

Art. 108. Son funciones de este Departamento:

- a) Ejecutar los estudios socio-económicos, estadísticos y de campo, necesarios para la realización de los proyectos; y
- b) Ejecutar los estudios y diseños de sistemas de abasteci-

miento de agua potable, alcantarillado y disposición de excretas para la zona rural.

DEL DEPARTAMENTO DE PROYECTOS POR FISCALIZACION

Art. 109. Son funciones de este Departamento:

- a) Fiscalizar y revisar los estudios y diseños para abastecimiento de agua potable, alcantarillado o disposición de excretas que se lleven a cabo por contrato; y
- b) Supervisar los estudios y diseños de agua potable, alcantarillado o disposición de excretas que se hayan realizado por otros organismos Nacionales, Regionales, Seccionales o Locales.

PARAGRAFO II

DE LA DIVISION DE CONSTRUCCIONES

Art. 110. Esta Unidad es la responsable de supervisar o fiscalizar la ejecución de las construcciones que se realicen por administración directa o por contratos, en toda la zona rural del país.

Art. 111. Las funciones de esta División son las siguientes:

- a) Realizar la construcción de pequeños sistemas de abastecimientos de agua potable, alcantarillado o disposición de excretas para comunidades rurales;
- b) Supervisar o fiscalizar la construcción de sistemas de agua potable, alcantarillado o disposición de excretas para comunidades rurales, que se ejecuten por contratos o por otros organismos; y
- c) Las demás que le asigne la Dirección Nacional de Saneamiento Básico Rural.

Art. 112. Esta División está integrada por los Departamentos de: Obras por administración y Obras por fiscalización.

DEL DEPARTAMENTO DE OBRAS POR ADMINISTRACION

Art. 113. Son funciones de este Departamento:

- a) Supervisar la construcción de sistemas de abastecimiento de agua potable, alcantarillado o disposición de excretas, que se ejecuten en la zona rural del país, principalmente en las que existe participación comunitaria.

DEL DEPARTAMENTO DE OBRAS POR FISCALIZACION:

Art. 114. Son funciones de este Departamento:

- a) Supervisar y fiscalizar la construcción de sistemas de abastecimiento de agua potable, alcantarillado o disposición de excretas, que se ejecuten en la zona rural del país, ya sea por contratos o por otros organismos Nacionales, Regionales, Seccionales o locales.

PARAGRAFO III

DE LA DIVISION DE OPERACION Y MANTENIMIENTO

Art. 115. Es una Unidad que se encarga de supervisar y evaluar, la operación y mantenimiento de abastecimientos de agua potable, sistemas de alcantarillado o disposición de excretas, de la zona rural del país.

Art. 116. Las funciones de esta División son las siguientes:

- a) Ejecutar las investigaciones y estudios necesarios para optimizar la operación y mantenimiento de la infraestructura sanitaria del área rural;

- b) Asesorar a las Juntas Administradoras de sistemas de infraestructura sanitaria, para un mejor cumplimiento de sus funciones; y
- c) Las demás que le asigne la Dirección Nacional de Saneamiento Básico Rural.

Art. 117. Esta División está integrada por los Departamentos de: Agua Potable y Disposición de excretas.

DEL DEPARTAMENTO DE AGUA POTABLE

Art. 118. Son funciones de este Departamento:

- a) Mantener una estadística actualizada de datos referentes a consumos de agua potable, control de cloración, etc, de los sistemas a cargo de las Juntas Administradoras;
- b) Preparar instructivos, formularios y más documentos necesarios para la administración de los sistemas; y
- c) Controlar y supervisar la reparación y ampliación de abastecimiento de agua potable, en las zonas rurales.

DEL DEPARTAMENTO DE DISPOSICION DE EXCRETAS

Art. 119. Son funciones de este Departamento:

- a) Controlar y asesorar las labores de administración de las Juntas Administradoras de sistemas de alcantarillado o disposición de excretas, de la zona rural; y
- b) Supervisar y evaluar la operación y mantenimiento de sistemas de alcantarillado o disposición de excretas en la zona rural.

PARAGRAFO IV

DEL DEPARTAMENTO DE PROMOCION Y EDUCACION SANITARIA

Art. 120. Esta Unidad tiene por finalidad promover la participación de la comunidad. en la construcción, operación y mantenimiento de las obras de infraestructura sanitaria.

Art. 121. Son funciones de este Departamento:

- a) Elaborar normas técnicas de promoción y educación sanitaria, para facilitar la implementación de programas de infraestructura sanitaria;
- b) Organizar las Juntas Administradoras de obras de infraestructura sanitaria y posteriormente asesorar y supervisar en el funcionamiento de las mismas;
- c) Realizar programas demostrativos para la instalación de bombas, letrinas, sanitarios campesinos, etc., que sirvan de modelo a cada comunidad; y
- c) Las demás que le asigne la Dirección Nacional de Saneamiento Básico Rural.

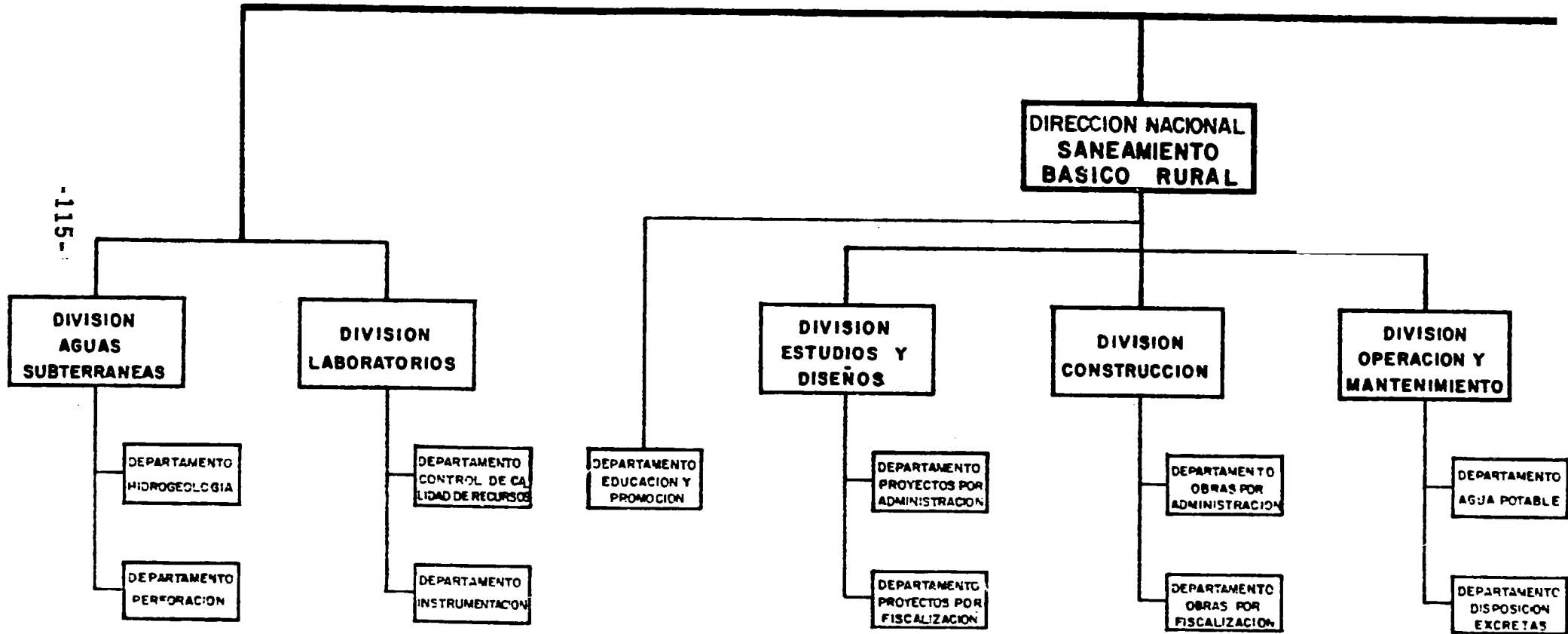
SECCION IV

DE LA DIRECCION NACIONAL DE SANEAMIENTO BASICO URBANO

Art. 122. Es un órgano encargado de dirigir en el área de saneamiento urbano, la fiscalización de los proyectos destinados a la ejecución de nuevas obras básicas o ampliación de las existentes; - la fiscalización de su construcción y la supervisión de su operación y mantenimiento, una vez que estén habilitados.

Art. 123. Son funciones de la Dirección Nacional de Saneamiento Básico - Urbano:

NIVEL OPERATIVO



APPENDIX D
Officials Visited

OFFICIALS VISITED

1. USAID/Ecuador

Dr. Kenneth Farr
Health Officer
USAID Mission, Quito, Ecuador

Eng. Herbert Caudill
Water and Sanitation Advisor
Integrated Rural Development Project
USAID Mission, Quito, Ecuador

Mrs. Betty Facey
Chief Engineer
USAID Mission, Quito, Ecuador

Mr. Paul Fritz
Deputy Chief
USAID Mission, Quito, Ecuador

2. Ecuadorian Institute for Sanitary Works (IEOS)

Eng. Gustavo Ruiz
Executive Director
Ecuadorian Institute for Sanitary Works
Quito, Ecuador

Eng. Mario Tobar
Director, Rural Water Directorate
Ecuadorian Institute for Sanitary Works
Quito, Ecuador

Eng. Milton Silva M.
Provincial Engineer
IEOS
Riobamba, Ecuador

Eng. Jorge Castillo
Provincial Engineer
IEOS
Ambato, Ecuador

Eng. Julio César Proaño B.
Provincial Engineer
IEOS
Latacunga, Ecuador

Eng. Juan Varela
Regional Inspector
IEOS
Quito, Ecuador

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Eng. José López F.
Provincial Engineer
IEOS
Portoviejo, Ecuador

Eng. Gustavo López
Chief, Construction Division
IEOS
Quito, Ecuador

Eng. Luis Pinto
Supervisor
IEOS
Quito, Ecuador

Lcdo. Eduardo Coral
Chief, Promotion Department
IEOS
Quito, Ecuador

Eng. Luis Ponce
Chief, Provincial Engineer
IEOS
Esmeraldas, Ecuador

3. Other

Eng. César Jaramillo
Director of Physical
Infrastructure
Secretariat of Integrated Rural
Development (SEDRI)
Quito, Ecuador

Eng. Freddy Castellón
Water Supply Specialist
InterAmerican Development Bank
(BID)
Quito, Ecuador

Eng. Guillermo Terán F.
Chief of Executing Unit for
Quimiag-Penipe Project
Riobamba, Ecuador

Eng. Oscar Skola
Chief of Executing Unit for
Salcedo Integrated Development
Area
Salcedo, Ecuador

Mr. Patrick Marnane
Evaluation Specialist Member
Evaluation Team
Quito, Ecuador

Eng. Hugo Chiriboga
Sanitary Engineer
Private Consultant
Quito, Ecuador

Eng. Rick McDonald
Peace Corps Volunteer
Ambato, Ecuador

APPENDIX E
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