APPENDIX D

A.I.D. EVALUATION SUMMARY - PART I

PD-ABG-737

1. BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS.
2. USE LETTER QUALITY TYPE, NOT "DOT MATRIX" TYPE

IDENTIFICATION DATA

A. Reporting A.I.D. Unit:
Mission or AID/W Office USAID/ECUADOR
(ES# _____)

B. Was Evaluation Scheduled In Current FY Annual Evaluation Plan?
Yes [X] Slipped [ ] Ad Hoc [ ]
Evaluation Plan Submission Date: FY ____ Q ____

C. Evaluation Timing
Interim [X] Final [ ]
Ex Post [ ] Other [ ]

D. Activity or Activities Evaluated (List the following information for project(s) or program(s) evaluated; if not applicable, list title and date of the evaluation report.)

Project No.	Project /Program Title	First PROAG or Equivalent (FY)	Most Recent PACD (Mo/Yr)	Planned LOP Cost (000)	Amount Obligate to Date (000)
518-0081	Water and Sanitation for Health and Ecuadorian Development	1989	12/93	4,000	2,993

ACTIONS

E. Action Decisions Approved By Mission or AID/W Office Director Action(s) Required	Name of Officer Responsible for Action	Date Action to be Completed
1. Purpose of 12-month extension will be to restructure IEOS.	K.Yamashita	Oct.1,1993
2. AID will provide TA to the Ministry of Housing and Urban Development.	K.Yamashita	On - going
3. Extension of the project will be conditioned upon following up on recommendations.	K.Yamashita	Oct.1,1993
4. A proposal will be submitted by IEOS for an extension with both restructuring and consolidation activities-criteria will be which activities need to be consolidated to lead to a new IEOS.	IEOS,PPD,GDO	Oct.1,1993
5. IEOS does have a reforestation program Project extension should include this.	IEOS,PPD,GDO	Oct.1,1993
6. Project steering committee should be established as recommended on page 8.	IEOS,GDO	N/A
7. No more commodities should be procured.	PMurgueytio AArratia	N/A
8. Health data should be collected. A PRISM consultant will advise on how to set up impact study,.and if time available, will carry it out.	P.Liefert K.Yamashita	9/93

(Attach extra sheet if necessary)

APPROVALS

F. Date Of Mission Or AID/W Office Review Of Evaluation: (Month) (Day) (Year)

G. Approvals of Evaluation Summary And Action Decisions:

	Project/Program Officer	Representative of Borrower/Grantee	Evaluation Officer	Mission or AID/W Office Director
Name (Typed)	Patricio Murgueytio	Diego González C.	Patricio Maldonado	John Sanbrailo
Signature				
Date	8/2/93	93-08+13		

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ABSTRACT

- Evaluation Abstract (Do not exceed the space provided)

The project purpose is to strengthen the Ecuadorian Institute of Sanitary Works capability to assist rural communities in eight provinces (Carchi, Imbabura, Pichincha, Cotopaxi, Chimborazo, Tungurahua, Azuay and El Oro) to: 1) install cost effective safe water supply systems and latrines; (2) use the water and latrines to improve family health status; and 3) maintain and improve the systems in the future.

This mid-term evaluation was conducted by a John Snow, Inc. Team on the basis of review of project files, reports, technical documents and advisory reports and diverse studies prepared; interviews with key personnel of the Ministry of Urban Development and Housing, the Ministry of Public Health, IEOS, USAID, World Bank, the United Nations Program, and the Inter-American Bank; visits to 11 rural communities. The purpose of the evaluation was to review the progress of the project and make recommendations for its continuation or termination by December 31, 1993. The evaluation was to determine the degree of design adaptation, the effectiveness, timeliness and quality of technical assistance and adaptation of the management and administrative process that was applied.

The major findings and conclusions are:

- The training and technical assistance with regard to management development that was adequately devised and developed by WASH stimulated the establishment of a management style that abided by the lines of authority but which, in turn, was implemented through teams and on the basis of agreements on objectives and identification of solutions to organizational and functional problems.
- The project planning and monitoring system was not sufficiently decentralized as was expected.
- The goals established for training could not be attained because the number of organizational and community training slots is too ambitious. The project did not provide the time needed to train the central group; funds did not come in on time, and component started several months behind schedule.
- The planning process for the health education component is carried out primarily on the central level. The provincial level only develops programming for weekly activities. There is no supervision of promoters on the provincial level due to the lack of IEOS funds to finance this effort.
- The quality of the technical assistance has been very good.

Recommendations:

- During the time left to carry out the Project, that the health training and operating and maintenance component be upgraded and that the diagnosis and inventory of Rural Potable Water and Sanitation System Construction program systems be finished.
- For the institutional training component, it is recommended that the Project continue only with those activities that are geared toward personnel who will possibly remain with the new IEOS, since there will be a personnel cutback.
- Given the conditions of uncertainty in which IEOS exists, it is recommended that USAID request GOE officials to develop a more precise legal status.
- Once the future of IEOS has been defined, it is recommended that consideration be given to the prospects a new project that would strengthen the provincial level and test new action alternatives in the field of rural potable water and sanitation system construction program, such as; participation of private sector, non-government organizations, Provincial Councils, and Municipalities. It is also recommended that the coastal area be covered more extensively.

Lessons Learned

Various rural communities inspected have been able to operate and maintain sophisticated water supply systems with treatment plants, including aeration, sedimentation, filtration, and chlorination components. This is a very positive result and it is partly due to the fact that those communities were able to pay a full-time trained operator.

The communities in the coastal region of Ecuador resist the idea of contributing with their own work to the construction of the Rural Potable Water and Sanitation System Construction Program systems; but they are prepared to cover operating and maintenance costs by means of timely payment of fees.

Hygienic water supply systems involving priming are very popular and accepted in Ecuador provided the water system delivers an adequate volume of this liquid.

COSTS

I. Evaluation Costs

1. Evaluation Team

Name	Affiliation	Contract Number OR TDY Person Days	Contract Cost OR TDY Cost (U.S. $)	Source of Funds
Dr. Reinaldo Grueso Dr. Enrique Gil Bellorin Andrew Karp		IQC No. PDC-5929-I-00-0109-00	56,000	Project Funds

2. Mission/Office Professional Staff Person-Days (Estimate) ______

3. Borrower/Grantee Professional Staff Person-Days (Estimate) ______

A.I.D. EVALUATION SUMMARY - PART II

SUMMARY

J. Summary of Evaluation Findings, Conclusions and Recommendations (Try not to exceed the three (3) pages provided)

Address the following items:

- Purpose of evaluation and methodology used
- Purpose of activity(ies) evaluated
- Findings and conclusions (relate to questions)
- Principal recommendations
- Lessons learned

March,1993

Mission or Office:	Date This Summary Prepared:	Title And Date Of Full Evaluation Report:
USAID/ECUADOR	July 27, 1993	Evaluation of the Water and Sanitation for Health for Ecuadorian Development Project

Purpose of Evaluation

The purpose of this evaluation is to review the progress of the WASHED Project and make recommendations for its continuation or termination by the date of 12-31-93 which is provided for in the Project agreement. This review must determine the degree of design adaptation; the degree of attainment and effectiveness of the objectives and actions that were taken, and it must also identify the internal and external factors that may have been able to limit the project's success. Also, the evaluation team must evaluate the effectiveness, timeliness, and quality of technical assistance and adaptation of the management and administrative process that was applied during the project.

Evaluation Methodology

The evaluation reviewed the project's gains, problems, obstacles, lessons learned, impact of actions taken, degree of institutional absorption of the latter, and prospects of the Ecuadorian Institute of Sanitation Works. This was achieved through interviews with key personnel of the Ministry of Urban Development and Housing, the Ministry of Pubic Health, the Ecuadorian Institute of Sanitation Works, USAID, the World Bank, the United Nations Development Program, and the Inter-American Development Bank. Also, 11 rural communities were visited and the basic reports and files of the project were reviewed, along with technical documents and advisory reports.

Findings and Recommendations

1. Institutional Development

a. Findings

a.1 The training and technical assistance with regard to management development that was adequately devised and developed by WASH stimulated the establishment of a management style that abided by the lines of authority but which, in turn, was implemented through teams and on the basis of agreements on objectives and identification of solutions to organizational and functional problems.

a.2 The project planning and monitoring system was not sufficiently decentralized as was expected. All provinces visited indicated that their proposals were not sufficiently discussed between the central level and the provincial level and that the decisions made by the central level regarding approval of projects and allocation of resources were not always followed up by an explanation of the decision that was made. In the case of project monitoring, success was achieved through the application of performance indicators for the majority of the components.

a.3 On the central level, coordination among the various components of the project was adequate. On the provincial level, each component worked in a vertical fashion and, therefore, integration and complementarily were not achieved. A Coordination Committee was established in one province for the various entities that participated in the water and latrine construction projects. This Committee worked very efficiently. A consortium of 63 Potable Water and Sewage Management Boards was established in that same province, that is, Cotopaxi, to procure materials and equipment and to manufacture sodium hypochlorite.

a.4 The information system for the operation and maintenance of the systems of the APWSM is poorly developed. Only one province was able systematically to set up budget, inventory, and human resources information. The computer equipment was underutilized.

a.5 56.5% of the central and provincial personnel trained in management development remain in the institution and 12 new chiefs and 13 second and third representatives on the provincial level are currently being trained.

a.6 One hundred percent of the members of the JAAPs (Community Water Boards) received training in the management of APSR systems. However, the management of some of the boards visited is very weak and it is necessary here to adjust the training programs on the basis of a better determination of the existing weaknesses.

a.7 In 100% of the Community Water Boards interviewed, it was observed that women held management and administrative positions and participated in the construction and rehabilitation of the APSB (Rural Potable Water and Sanitation Construction Program) systems.

b. Recommendations

b.1 Continue training in management and monitoring on the level of the new provincial chiefs and second and third representatives.

b.2 Define and develop a program for support through the Project Coordinator and the national advisors, duly coordinated with the provinces, properly scheduled in terms of time, and provided with agreements on specific objectives in order, during the time left of the project, to give the various components the proper institutional setup and to strengthen the planning and coordination mechanisms.

b.3 In two provinces, design and set up an adequate management information system for the operating and maintenance component (O&M), including computer programs and the training of the system's users. This component could be financed with funds that are not being used to pay promoters and other items whose value according to the Project Coordinator could amount to something like US$450,000. A national advisor could be hired for a period of six months to do that job.

2. Training

a. Findings

a.1 30% of the institutional personnel and 43% of the community personnel that were programmed in the design of the project have been trained.

a.2 The training component is functioning as a parallel and special structure within IEOS, and to date has not been formally incorporated.

a.3 The goals established in the project draft could not be attained because the number of organizational and community training slots is entirely too ambitious; the draft did not provide the time needed to train the central group; the budget funds did not come in on time and the component started out several months behind schedule.

a.4 Officials on the central level have good professional capacity; they are working on systematized planning with logical, and dynamic objectives; monitoring and evaluating on the basis of process indicators and they have good command of the methodology of informal adult education. On the provincial level, it is necessary to develop a more efficient management and leadership process in the component through the coordinators and promoters.

a.5 There is a need for the central level to determine clear lines of action as to the measurement of knowledge before and after the training.

a.6 So far, there has been no follow-up and evaluation as to the knowledge acquired by trained community personnel due to the lack of funds with which to finance this activity. This task is of major importance to provide feedback for the training process and to adjust the program.

a.7 Foreign technical assistance provided by WASH has been of great importance in setting the component up and getting it to function.

b. Recommendations

b.1 Establish the Training Unit within the IEOS.

b.2 Develop the follow-up and evaluation activities relating to knowledge acquired by trained community and institutional personnel.

b.3 On the basis of the results of the follow-up and evaluation process relating to existing and acquired knowledge, develop the following manuals: (a) standards and procedures of the training component, (b) training for Community Water Boards, and (c) operators for the Rural Potable Water and Sanitation System Construction Program systems.

3. Health Education

a. Findings

a.1 This component is a result of the evaluation of the National Health Education Program, PRONAES. It was readjusted in methodological terms moving on from social marketing to interpersonal communication via promoters who worked on the family level.

a.2 The planning process is being carried out primarily on the central level. The provincial level only develops programming for weekly activities. There is no supervision of promoters on the provincial level due to the lack of IEOS funds to finance this effort.

a.3 The promoters are very busy; they have attained excellent acceptance by the community, the leaders, the Community Water Boards, as well as the teachers, and they are achieving good results. However, there are problems when it comes to carrying out all of the assigned tasks due to the size of the communities covered. When it was decided to have five communities covered per promoter, no thought was given to the number of inhabitants per community.

b. Recommendations

b.1 It is urgent to terminate social-cultural research in order with greater clarity to define the educational strategy and to prepare the educational materials to be used by the promoters.

b.2 The promoter must be guided in terms of planning his health education activities and home visits with the active participation of the community.

b.3 Provide more support for the provincial levels in matters of planning, monitoring, evaluation, and supervision. It is necessary to propose more specific and measurable objectives covering shorter periods of time in order to lend more dynamism to the component.

4. Operation and maintenance

a. Findings

a.1 The design of this component was adequate and appropriate, but it did not emphasize coordination with the other components.

a.2 The quality of the technical assistance has been very good.

a.3 The conceptual basis for O&M, is that the beneficiary communities are responsible for O&M, and that user-fees should be set high enough for the communities to be self-sufficient in this respect. However, the User-Fee Study prepared by IEOS has a different concept regarding how this should apply to the poorest communities. This is a very sensitive and important subject that merits careful review.

a.4 IEOS has developed a very useful and fairly complete "Diagnostic and Inventory" of existing water supply and sanitation systems. This will be an extremely useful tool for prioritizing work on rehabilitation and expansion of existing systems. The evaluation team has not observed any inaccuracies in this data, except for some information being out-of-date.

a.5 Most system operators and community water boards (JAAPs) have received training and understand how to accomplish their O&M responsibilities. This applies not only to relatively simple systems, but also to systems with somewhat sophisticated water treatment plants. The O&M component of the project has contributed significantly to this very positive result. However, in other respects it is still too soon to evaluate the impact of the O&M component, because most of what it has developed is just beginning to be utilized in the field.

b. Recommendations

b.1 It is recommended that an independent engineer be contracted to review a small random sample of the information in the Diagnostic and Inventory of RWSS to verify its accuracy. This called for in part because personnel working on a World Bank funded rural water supply and sanitation project have stated that they have no faith at all in this data.

b.2 The evaluation team recommends that more attention be given to remedies for the frequent deforestation of the water sheds which feed many of the rural water systems.

Many water sources are already providing significantly reduced flows due to deforestation. IEOS personnel are aware of this problem, but do not see it as their role to coordinate their work with other institutions which are involved with reforestation work, nor do they see it as their role to become directly involved with reforestation.

5. Appropriate technology

a. Findings

a.1 The design of this component of the project included some very worthwhile objectives related to research studies. However, it failed to propose that the new Appropriate Technology Unit of IEOS should take a coordinating and leadership role in relation to all innovative aspects of appropriate technology within the institution.

a.2 This component of the project has done a better job than what was called for in the project design, but nonetheless has not undertaken many tasks which the evaluation team believes that a better designed project would have called for. For instance, it has not promoted an interchange of information between the provincial offices of IEOS, even though some very good appropriate technology developments have taken place in the provinces.

a.3 This component of the project has been overly centralized, and has had less communication with the provincial offices of IEOS than would be ideal.

a.4 The periodic technical assistance (T.A.) provided by the WASH project was excellent. The quality of T.A. provided by the full-time national advisor varied, as the advisor changed, and as it took some time to develop relevant procedures. However, some very good results have been produced as a result of this T.A.

a.5 Because none of the research studies have yet been completed and implemented in the field, it is too early to evaluate the impact of this component. However, it is anticipated that these studies will have a positive impact on rural water and sanitation projects. This is especially the case for the latrine study and the review of the design norms and standards.

b. Recommendations

b.1 The principal recommendation related to this component of the project, is that it should take a broader role in relation to appropriate technology. For instance, in addition to the publication of its own studies and reports, it should facilitate the dissemination of existing information as well as the exchange of information between the provincial offices of IEOS.

6. Construction

a. Findings

a.1 This component only constructed about 158 systems that were planned. This included: (a) about 52 of the 80 systems that were planned with ESF-AID funding (65% of what was programmed); and (b) about 106 of the 540 systems that were planned with FONASA and other IEOS funding (20% of what was programmed).

a.2 Although the design of this component was adequate, the principal constraint on the number of projects that were built was lack of funding.

b. Recommendations

b.1 The evaluation team recommends that IEOS fulfill it commitment to finance the implementation of the construction component, and that systems be constructed in a manner consistent with the design of this component.

7. Project Management and Administrative

a. Findings

a.1 Project Coordinator has been timely and deft in solving problems that cropped up in the course of project implementation.

a.2 The system of project direction and coordination was found to have been affected by various changes that took place within the IEOS. Also, its directors do not participate in this process and, various standards, procedures, and programs were not established on an institutional scale.

b. Recommendations

b.1 Propitiate the establishment of a Project Steering Committee chaired by the Under Secretary of Basic Sanitation, Ministry of Urban Development and Housing, and made up of the financial, human resources, planning, and basic sanitation directors of the Ecuadorian Institute of Sanitation Works, the project managers for the IEOS, and USAID, and the Project Coordinator. The principal functions of this committee will be as follows: (a) approve and modify the operations plan on the basis of the evaluations and results deriving from project monitoring; (b) decide on the absorption within the institution of the standards and procedures for decentralization, operating and maintenance component, as well as health training and education; (c) keep the members informed on the restructuring process pertaining to the IEOS and on coordination with other basic sanitation projects being developed in the country.

8. Project Financing Through the Ecuadorian Institute of Sanitation Works and USAID

a. Findings

a.1 Although this task was not included within the scope of work to be done by the evaluation team, it was very difficult to gain access to up-to-date accounting information that would make it possible easily to identify the use of the counterpart funds in the project.

a.2 The budget funds assigned by IEOS for construction and to take care of the programs on the community level as included in the project have fallen seriously short during the period of 1991-1992 according to project monitoring reports prepared by WASH.

a.3 According to the provincial officials, the few funds available since August 1992 for the programs were transferred by USAID.

b. Recommendations

b.1 Through the above-proposed Project Steering Committee, ensure timely transfers of Ecuadorian Institute of Sanitation Works funds for the development of project components on the provincial level in accordance with the agreement signed between the Government of Ecuador and USAID.

9. Material Resources for Project

a. Findings

a.1 The pickup trucks and motorcycles for the operating and maintenance component were turned over to the provinces only at the end of 1992. The audio-visual equipment for the health training and education components was delivered in January 1993. Equipment to establish water quality is in the process of procurement through USAID. Equipment loaned by OPS/OMS is currently being used in one province.

b. Recommendations

b.1 Get USAID to speed up the purchase and delivery of equipment to check water quality.

E. Lessons Learned

The external and exogenous factors must always be taken into account. E.g., on almost all occasions, a change of government brings with it changes in policies, new priorities, and, on occasion, profound changes in the organizational structure and functions of the various institutions. This is what is happening as a result of the creation of the new MOUDH and due to the relocation of the IEOS, an entity that was very seriously questioned by the government as well as some foreign donors due to its lack of efficiency, excessive bureaucracy, and the high cost of its actions. Decentralization is an important target but it is very difficult to attain. In this project, decentralization of processes for the construction of Rural Potable Water and Sanitation System Construction Program systems was implemented through the so-called operational modules. However, components involved in technology, operation, and maintenance,as well as health training and education continue to be heavily centralized. Appropriate technologies developed or adopted locally without the participation of the central authorities are highly important. This is true of the manufacture of sodium hypochlorite by the Consortium of 63 Community Water Boards in the province of Cotopaxi and by individual communities in the province of Azuay.

Deforestation must never be ignored in programs whose objective or goal is to supply water in long-range terms.

ATTACHMENTS

K. Attachments (List attachments submitted with this Evaluation Summary; always attach copy of full evaluation report, even if one was submitted earlier; attach studies, surveys, etc., from "on-going" evaluation, if relevant to the evaluation report.)

Evaluation Report

COMMENTS

L. Comments By Mission, AID/W Office and Borrower/Grantee On Full Report

EVALUATION OF USAID/ECUADOR - WASHED PROJECT

by

Dr. Reinaldo Grueso, Team Leader
Dr. Enrique Gil Bellorin
Andrew Karp

March 1993

This evaluation was carried out for the USAID mission in Ecuador under IQC (PDC-5929-I-00-0109-00)

JSI

EVALUATION OF USAID/ECUADOR - WASHED PROJECT

by

Dr. Reinaldo Grueso, Team Leader
Dr. Enrique Gil Bellorin
Andrew Karp

March 1993

This evaluation was carried out for the USAID mission in Ecuador under IQC (PDC-5929-I-00-0109-00)

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TABLE OF CONTENTS

ANNEXES

GLOSSARY OF ACRONYMS

APSR	Rural Potable Water and Sanitation Program
CLAS	Local Health Education Committees
FASBASE	Basic Health Services
GOE	Government of Ecuador
IDB	Inter-American Development Bank
IEOS	Ecuadorian Institute of Sanitary Works
JAAP	Community Water Administration Boards
LAC	Latin America and Caribbean
ONG	Non-Governmental Organizations
OMS	World Health Organization
OPS	Pan-American Health Organization
PACD	Project Anticipated Completion Date
PAHO	Pan American Health Organization
PRONAES	National Health Education Program
UCETA	Unidad de Coordinacion de Estudios de Technologia Apropiada

I. EXECUTIVE SUMMARY

A. Project Background and Objective

The Government of Ecuador (GOE) and USAID have been carrying out Project No. 518-0081--Water and Sanitation for Ecuadorian Health and Development--WASHED--since 27 September 1989. The objective of this program is to contribute to the improvement of the level of health of infants and children in Ecuador. The purpose is to strengthen the institutional capacity of the Ecuadorian Institute of Sanitary Works--IEOS--to support the eight provinces with regard to the following: (1) installation of technologically appropriate and low-cost water systems and latrines; (2) achieving adequate use of water and of latrines to improve the family's state of health; and (3) in the future, implement efficient programs to maintain and improve the potable water and latrine systems.

B. Purpose of Evaluation

The purpose of this evaluation is to review the progress of the WASHED Project and make recommendations for its continuation or termination by the date of 12-31-93 which is provided for in the Project agreement. This review must determine the degree of design adaptation; the degree of attainment and effectiveness of the objectives and actions that were taken, and it must also identify the internal and external factors that may have been able to limit the project's success. Besides, the evaluation team must evaluate the effectiveness, timeliness, and quality of technical assistance and adaptation of the management and administrative process that was applied during the project.

C. Evaluation Methodology

The team charged with the evaluation reviewed the project's gains, the problems, obstacles, lessons learned, impact of actions taken, degree of institutional absorption of the latter, and prospects of the Ecuadorian Institute of Sanitation Works. This was achieved through interviews with key personnel of the Ministry of Urban Development and Housing, the Ministry of Public Health, the Ecuadorian Institute of Sanitation Works, USAID, the World Bank, the United Nations Development Program, and the Inter-American Development Bank. Besides, 11 rural communities were visited and the basic reports and files of the project were reviewed, along with technical documents and advisory reports, plus diverse studies prepared within the project.

D. Findings and Recommendations

1. Institutional Development

a. Findings

a.1 The training and technical assistance with regard to management development that was adequately devised and developed by WASH stimulated the establishment of a management style that abided by the lines of authority but which, in turn, was implemented through teams and on the basis of agreements on objectives and identification of solutions to organizational and functional problems. This style was instituted within the group charged with developing the project on the central level. Some progress was achieved on the provincial level and rather little progress was attained on other levels of the Ecuadorian Institute of Sanitation Works.

a.2 The project planning and monitoring system was not sufficiently decentralized as was expected. All provinces visited indicated that their proposals were not sufficiently discussed between the central level and the provincial level and that the decisions made by the central level as regards approval of projects and allocation of resources were not always followed up by an explanation as to the rationality of the decision that was made. In the case of project monitoring, good success was achieved through the application of a group of performance indicators for the majority of the components.

The project's operations plans for 1991 and 1992 were approved on time. The operations plan for 1993 was being studied by the authorities of the Ecuadorian Institute of Sanitation Works starting in the month of November.

a.3 On the central level, coordination between the various components of the project was adequate. On the provincial level, each component worked in a vertical fashion and, therefore, integration and complementarity--that must be inherent in the various components of the project--were not achieved. A Coordination Committee was established in one province for the various entities that participated in the water and latrine construction projects on the rural level. This Committee worked very efficiently. A consortium of 63 Potable Water and Sewage Management Boards was established in that same province, that is, Cotopaxi, to procure materials and equipment and to manufacture sodium hypochlorite.

a.4 The information system for the operation and maintenance of the systems of the APSR is poorly developed. Only one province was able systematically to set up budget, inventory, and human resources information. The computer equipment was underutilized.

a.5 56.5% of the central and provincial personnel trained in management development remain in the institution and 12 new chiefs and 13 second and third representatives on the provincial level are currently being trained.

a.6 One hundred percent of the members of the JAAPs (Community Water Boards) received training in the management of APSR systems. However, the management of some of the boards visited is very weak and it is necessary here to adjust the training programs on the basis of a better determination of the existing weaknesses.

a.7 In 100% of the Community Water Boards interviewed, it was observed that women held management and administrative positions and participated in the construction and rehabilitation of the APSB (Rural Potable Water and Sanitation Construction Program) systems.

b. Recommendations

b.1 Continue training in management and monitoring on the level of the new provincial chiefs and second and third representatives.

b.2 Define and develop a program for support through the Project Coordinator and the national advisors, duly coordinated with the provinces, properly scheduled in terms of time, and provided with agreements on specific objectives in order, during the time left of the project, to give the various components the proper institutional setup and to strengthen the planning and coordination mechanisms.

b.3 In two provinces, design and set up an adequate management information system for the operating and maintenance component (O&M), including computer programs and the training of the system's users. This component could be financed with funds that are not being used to pay promoters and other items whose value according to the Project Coordinator could amount to something like US$ 450,000. A national advisor and a program could be hired for a period of six months to do that job.

2. Training

a. Findings

a.1 Thirty percent of the institutional personnel and 43% of the community personnel that were programmed in the design of the project have been trained, as of the date of this evaluation.

a.2 The training component is functioning as a parallel and special structure within IEOS, and as of the present date has not been formally incorporated within the Institute.

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a.3 The goals established in the project draft could not be attained because the number of organizational and community training slots is entirely too ambitious; the draft did not provide the time needed to train the central group; the budget funds did not come in on time and the component started out several months behind schedule.

a.4 The group of officials on the central level has good professional capacity; it is working on systematized planning with congruent, logical, and dynamic objectives; it is monitoring and evaluating the plan on the basis of process indicators and it has good command of the methodology of informal adult education. On the provincial level, it is necessary to develop a more efficient management and leadership process in the component through the coordinators and promoters.

a.5 There is a need for having the central level determine clear lines of action as to the measurement of knowledge before and after the training sessions; it is also necessary to establish the number of persons, per community, who must attend each type of event; one must also determine the number of events which one person can attend and one must avoid falling into the error of administering training just to meet a particular goal.

a.6 So far, there has been no follow-up and evaluation as to the knowledge acquired by trained community personnel due to the lack of funds with which to finance this activity. This task is of major importance to provide feedback for the training process and to adjust the program.

a.7 Foreign technical assistance provided by WASH has been of great importance in setting the component up and getting it to function.

b. Recommendations

b.1 Establish the Training Unit on an institutional basis within the Ecuadorian Institute of Sanitation Works and provide the technical-administrative support needed to decentralize the component on the provincial level.

b.2 On a priority basis, develop the follow-up and evaluation activities relating to knowledge acquired by trained community and institutional personnel.

b.3 On the basis of the results of the follow-up and evaluation process relating to existing and acquired knowledge, develop the following manuals: (a) standards and procedures of the training component, (b) training for Community Water Boards, and (c) operators for the Rural Potable Water and Sanitation System Construction Program systems.

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3. Health Education

a. Findings

a.1 This component is a result of the evaluation of the National Health Education Program, PRONAES, which was developed as part of Project No. 518-0015; it was readjusted in methodological terms moving on from social marketing to interpersonal communication via promoters who worked on the family level.

a.2 Attainment of the objectives of this component was found to be behind schedule because, during a very short period of time, it had five advisors; that did not make it possible to lend continuity to the process. Besides, the targets proposed for each year are very general and do not permit a demarcation of specific activities.

a.3 The planning process is being carried out primarily on the central level. The provincial level only develops programming for weekly activities. There is no supervision of promoters on the provincial level due to the lack of Ecuadorian Institute of Sanitation Works funds to finance this effort.

a.4 The promoters are very busy; they have attained excellent acceptance by the community, the leaders, the Community Water Boards, as well as the teachers, and they are achieving goods results. However, there are problems when it comes to carrying out all of the assigned tasks due to the size of the communities covered. When it was decided to have five communities covered per promoter, no thought was given to the number of inhabitants per community.

a.5 Social-cultural research has not been finished and the promoters are using educational materials that are not the result of the beliefs, customs, knowledge, and practices of the population.

b. Recommendations

b.1 It is urgent to terminate social-cultural research in order with greater clarity to define the educational strategy and to prepare the educational materials to be used by the promoters.

b.2 The promoter must be guided in terms of planning his health education activities and home visits with the active participation of the community, identifying the availability of members of the home and the leaders; this means jointly determining the problems encountered as well as the solution alternatives, and this calls for the active participation of community members who have already been trained.

b.3 Provide more support for the provincial levels in matters of planning, monitoring, evaluation, and supervision. It is necessary to propose more specific and measurable

objectives covering shorter periods of time in order to lend more dynamism to the component.

4. Operation and maintenance

a. Findings

a.1 The design of this component of the project was adequate and appropriate, except insofar as it did not emphasize coordination with the other components of the project.

a.2 The quality of the technical assistance has been very good.

a.3 The conceptual basis for O&M, stated in the project paper, is that the beneficiary communities are responsible for O&M, and that user-fees should be set high enough for the communities to be self-sufficient in this respect. However, the User-Fee Study prepared by IEOS has a different concept regarding how this should apply to the poorest communities. This is a very sensitive and important subject that merits careful review.

a.4 IEOS has developed a very useful and fairly complete "Diagnostic and Inventory" of existing water supply and sanitation systems. This will be an extremely useful tool for prioritizing work on the rehabilitation and expansion of existing systems. The evaluation team has not observed any inaccuracies in this data, except for some information being out-of-date.

a.5 Most system operators and community water boards (JAAPs) have received training and understand how to accomplish their O&M responsibilities. This applies not only to relatively simple systems, but also to systems with somewhat sophisticated water treatment plants. The O&M component of the project has contributed significantly to this very positive result. However, in other respects it is still too soon to evaluate the impact of the O&M component, because most of what it has developed is just beginning to be utilized in the field.

b. Recommendations

b.1 It is recommended that an independent engineer be contracted to review a small random sample of the information in the Diagnostic and Inventory of RWSS to verify its accuracy. This is called for in part because personnel working on a World Bank funded rural water supply and sanitation project have stated that they have no faith at all in this data.

b.2 The evaluation team recommends that more attention be given to remedies for the frequent deforestation of the water sheds which feed many of the rural water systems.

Many water sources are already providing significantly reduced flows due to deforestation. IEOS personnel are aware of this problem, but do not see it as their role to coordinate their work with other institutions which are involved with reforestation work, nor do they see it as their role to become directly involved with reforestation.

5. Appropriate technology

a. Findings

a.1 The design of this component of the project included some very worthwhile objectives related to research studies. However, it failed to propose that the new Appropriate Technology Unit of IEOS should take a coordinating and leadership role in relation to all innovative aspects of appropriate technology within the institution.

a.2 This component of the project has done a better job than what was called for in the project design, but nonetheless has not undertaken many tasks which the evaluation team believes that a better designed project would have called for. For instance, it has not promoted an interchange of information between the provincial offices of IEOS, even though some very good appropriate technology developments have taken place in the provinces.

a.3 This component of the project has been overly centralized, and has had less communication with the provincial offices of IEOS than would be ideal.

a.4 The periodic technical assistance (T.A.) provided by the WASH project was excellent. The quality of T.A. provided by the full-time national advisor varied, as the advisor changed, and as it took some time to develop relevant procedures. However, some very good results have been produced as a result of this T.A.

a.5 Because none of the research studies have yet been completed and implemented in the field, it is too early to evaluate the impact of this component. However, it is anticipated that these studies will have a positive impact on rural water and sanitation projects. This is especially the case for the latrine study and the review of the design norms and standards.

b. Recommendations

b.1 The principal recommendation related to this component of the project, is that it should take a broader role in relation to appropriate technology. For instance, in addition to the publication of its own studies and reports, it should facilitate the dissemination of existing information, as well as the exchange of information between the provincial offices of IEOS.

6. Construction

a. Findings

a.1 This component only constructed about one hundred and fifty-eight (158) of the six-hundred and forty (640) systems that were planned. This included: (a) about 52 of the 80 systems that were planned with ESF-AID funding (65 % of what was programmed); and (b) about 106 of the 540 systems that were planned with FONASA and other IEOS funding (20 % of what was programmed).

a.2 Although the design of this component was adequate, the principal, and perhaps only, constraint on the number of projects that were built was lack of funding.

b. Recommendations

b.1 The evaluation team recommends that IEOS fulfill it commitment to finance the implementation of the construction component, and that systems by constructed in a manner consistent with the design of this component.

7. Project Management and Administrative

a. Findings

a.1 The administrative action of the Project Coordinator has been timely and deft as regards the solution of problems that cropped up in the course of project implementation.

a.2 The system of project direction and coordination was found to have been affected by various changes that took place within the Ecuadorian Institute of Sanitation Works. Besides, the directors of the Ecuadorian Institute of Sanitation Works do not participate in this process and, therefore, various standards, procedures, and programs were not established on an institutional scale.

b. Recommendations

b.1 Propitiate the establishment of a Project Steering Committee chaired by the Under Secretary of Basic Sanitation, Ministry of Urban Development and Housing, and made up of the financial, human resources, planning, and basic sanitation directors of the Ecuadorian Institute of Sanitation Works, the project managers for the Ecuadorian Institute of Sanitation Works, and USAID, and the Project Coordinator. The principal functions of this committee will be as follows: (a) approve and modify the operations plan on the basis of the evaluations and results deriving from project

b. Recommendations

b.1 Get USAID to speed up the purchase and delivery of equipment to check water quality.

10. Allocation of Human Resources

a. Findings

a.1 The process of hiring foreign technical assistance personnel was six months behind schedule and hiring of domestic personnel was 12 months behind; this significantly influenced the belated start of various project components.

b. Recommendations

b.1 It is recommended that one domestic advisor and one programmer be hired for a period of six months to draw up and implement a management information system for the operating and maintenance component and to train system users.

E. Recommendations on the Future of the WASHED Project

Based on this evaluation, the evaluating team would like to recommend that during the time left to carry out the Project (until 31 December 1993), the health training and operating and maintenance components be upgraded and documented and that the diagnosis and inventory of Rural Potable Water and Sanitation System Construction Program systems be finished.

This upgrading, documentation, and inventory effort will be very useful to the new government unit that will take responsibility for the Rural Potable Water and Sanitation System Construction Program systems on the rural level.

As for the institutional training component, it is recommended that one continue only with those activities that are geared toward personnel who will possibly remain within the new Ecuadorian Institute of Sanitation Works since, according to the authorities, there will be a personnel cutback during the next several months.

Given the conditions of uncertainty in which the Ecuadorian Institute of Sanitation Works exists, it is recommended that USAID request the domestic authorities to come up with a more precise legal definition on this institution, its possible placement within the structure of the State and its new functions and priorities. On the basis of this definition, USAID could provide technical support for the Government of Ecuador through the remaining funds of the Project.

Once the future of the Ecuadorian Institute of Sanitation Works has been defined legally, it is recommended that consideration be given to the prospects of a new project that would strengthen the provincial level and test new action alternatives in the field of Rural Potable Water and Sanitation System Construction Program systems, such as: participation of private sector, non-government organizations, Provincial Councils, and Municipalities. It is also recommended that high priority be assigned to the coastal area due to its great problems and the coverage shortfalls of the Rural Potable Water and Sanitation System Construction Program systems.

F. Project Impact on Health

At this moment, it is difficult to evaluate the impact of the project on health because: (a) the activities of the project are still in the process of implementation; (b) the most recent information available on infant sickness and death rates goes back to 1990; and (c) there is no basic information on the health situation in the communities taken care of by the project. Only general, overall information is available for the entire province.

G. Lessons Learned

Much experience was gained during the two years in which this project was being implemented; some of these experiences are encouraging and others are rather average. One of them is that CHANGE IS DIFFICULT. Modifications within the institution always drag out and turn out to be more complicated and difficult than imagined during project drafting.

The external and exogenous factors must always be taken into account. For example, on almost all occasions, a change of government brings with it changes in policies, new priorities, and, on occasion, profound changes in the organizational structure and functions of the various institutions. This is what is happening as a result of the creation of the new Ministry of Urban Development and Housing and due to the relocation of the Ecuadorian Institute of Sanitation Works, an entity that was very seriously questioned by the government itself as well as some foreign donors due to its lack of efficiency, excessive bureaucracy, and the high cost of its actions.

Decentralization is an important target but it is very difficult to attain. In this project, decentralization of processes for the construction of Rural Potable Water and Sanitation System Construction Program systems was implemented through the so-called operational modules. However, components involved in technology, operation, and maintenance, as well as health training and education continue to be heavily centralized.

Various rural communities inspected have been able to operate and maintain sophisticated water supply systems with treatment plants, including aeration, sedimentation, filtration, and

chlorination components. This is a very positive result and it is partly due to the fact that those communities were able to pay a full-time trained operator.

The communities in the coastal region of Ecuador resist the idea of contributing with their own work to the construction of the Rural Potable Water and Sanitation System Construction Program systems; but they are prepared to cover operating and maintenance costs by means of timely payment of fees.

Hygienic water supply systems involving priming are very popular and accepted in Ecuador provided the water system delivers an adequate volume of this liquid.

Appropriate technologies developed or adopted locally without the participation of the central authorities are highly important. This is true of the manufacture of sodium hypochlorite by the Consortium of 63 Community Water Boards in the province of Cotopaxi and by individual communities in the province of Azuay.

Deforestation must never be ignored in programs whose objective or goal is to supply water in long-range terms.

II. INTRODUCTION

A. Background

The Government of Ecuador and USAID realized that over the past 10 years sicknesses caused by a deficient level of basic sanitation constitute one of the most important factors leading to high infant and child mortality rates and high general sickness rates.

By way of a response to the above situation, the Government of Ecuador, GOE, and the United States Agency for International Development, USAID, carried out the project called Integrated Rural Health System (AID-LAC-P-518-0015) which included a [potable] water and sanitation [utility water] supply component. This project began in 1982 and was completed in 1989; it was evaluated in May 1989 and was followed up through the drafting and development of the Potable and Sanitation Water for the Health and Development of Ecuador Project--WASHED--(AID-LAC-P-568); it is the object of this evaluation.

The stated objective for the WASHED Project is to contribute to the improvement of individuals under the age of one and children, in general, in Ecuador. The intent is to strengthen the institutional capacity of the Ecuadorian Institute of Sanitation Works to support the rural communities in the provinces of Carchi, Imbabura, Pichincha, Cotopaxi, Tungurahua, Chimborazo, Azuay, and El Oro as regards the following: (1) installation of technologically appropriate and low-cost potable water and latrine systems; (2) achieving adequate use of water and latrines to improve the state of family health; and (3) in the future, conduct efficient programs to maintain and improve the water and latrine systems.

Project components according to the Project Paper are:

1. Construction of systems.

Through this component, financial support and technical assistance are provided to strengthen the Rural Potable Water and Sanitation System Construction Program--APSB--in the eight provinces covered. This component includes the development of new procedures for the planning, budgeting, and monitoring of the construction and adoption of the so-called operational modules. By the time the project is finished, two operational modules must have been established in each of the provinces covered. Besides, 80 water systems will be built using the balance from the resources of the EFS funds and another 80 systems for an approximate figure of $800,000,000 [sucres] through FONASA (National Health Fund). By the time the project is finished, a total of 640 systems will have had to be installed in order to cover approximately 320,000 inhabitants in the rural area of the provinces included in the project.

2. Health education.

This component includes educational actions to reduce the sickness and death rates in children under the age of one and, in general, children under the age of five. The education program seeks to employ a social marketing approach and the techniques of the mass media as well as methods of an interpersonal character on the community level. The project provides financial support to hire as many as 70 promoters who will cover a maximum of five communities each. The project supplies technical short-term and long-term assistance, financial support for a survey on knowledge, attitudes, and practices-CAP-, training of promoters, and transmission of educational messages via radio and television.

3. Operation and maintenance.

This component has two stages. The first which must be carried out during the period from January 1990 to September 1990 includes the organization of operating and maintenance units on the central level and in each of the provinces covered by the project; training of central and provincial personnel; definition of operating and maintenance policies; preparation of an inventory on potable water systems in the eight provinces; drafting an operating and maintenance plan for each province and designing an information system to monitor and guide planned implementation.

The second stage which must be developed between January 1991 and December 1993 includes the implementation of the operating and maintenance program in all provinces and the preparation of a study of rates and fees in the two pilot provinces; by the project's deadline, negotiations must have been completed for its implementation in all of the covered communities. To put this component together, the project provides financial support earmarked for the payment of personnel, operating expenses, technical assistance, equipment purchase, training expenditures, and conduct of specific studies. The equipment supplied is made up of tools and materials, nine (9) four-wheel pickup trucks, 20 motorcycles, plus the construction of eight (8) combined operating and maintenance stockrooms and workshops.

4. Appropriate technology.

Through this component, the project provides technical assistance and financial support to carry out an applied research program employing technologies that are appropriate for specific circumstances and environments and that will make it possible to build low-cost, efficient potable and sanitation water systems that will be easy to operate, maintain, and repair. Training workshops will be carried out to boost the learning process of this component.

5. Training.

The training activities included in the Project have the following objectives:

(a) improve the technical and management skills of central and field personnel, and;

(b) introduce new administrative practices and technical skills for decentralization and delegation on the provincial level, health education, application and development of appropriate technology, and evaluation of impact in this type of projects.

The majority of directors and division chiefs on the central level and the provincial directors must be trained by foreign specialists and domestic consultants. A total of 2,288 Ecuadorian Institute of Sanitation Works officials and 5,768 members of the Community Water Boards, promoters in the field of health, community leaders, and rural teachers will be trained for the operating and maintenance program and the health education activities of the project.

The project agreement was signed on 27 September 1989 and its termination date is 31 December 1993.

The total cost of the project is US$ 22.361 million of which US$ 15.761 million are the domestic counterpart that includes US$ 1.6 million in local funds coming from the EFS; this portion is used for the construction of new water and sanitation systems. USAID contributes a total of US$ 4 million of which US$ 1.664 are in foreign currency; this sum will be used to pay for international technical assistance (US$ 1.035 million), training abroad, purchase of equipment, and for evaluation and audit of the project as well as for contingency expenditures and to allow for inflation. The rest of the USAID contribution, that is, US$ 2.236 million is in local currency and will be used to defray the domestic technical assistance expenses (US$ 300,000) to pay for training expenses in the country, to purchase materials, to pay personnel, and for the services of the operating and maintenance program, evaluation and audit, and to cover contingency expenses as well as to allow for inflation.

B. Purpose of Evaluation

According to the terms of reference drawn up by the evaluation team, a review must be made of the progress achieved by the WASHED Project and recommendations must be submitted for its continuation or termination on the date provided for in the project agreement (31 December 1993).

As far as its outline is concerned, this review must determine the following aspects: (a) degree of adaptation of outline to attain goals within timetable established; (b) validity of premises established within logical framework; (c) level of adjustment of programmed technical assistance and validity of project components.

As for each of the project components, it is necessary to evaluate the degree of attainment and effectiveness of the objectives and to identify the internal and external factors that may have limited the project's success. It is also necessary to bring out the possible impact which each of them has had and the level of adjustment of organizational structures and personnel standards of the Ecuadorian Institute of Sanitation Works so as to ensure continuity in the activities developed through the project once financial support from USAID has been terminated.

Regarding the management and administration of the project, it is necessary to determine the degree of adaptation and efficiency of this process on the part of the Ecuadorian Institute of Sanitation Works and USAID, including its coordination, monitoring, and supervision, and identifying the limitations that may have affected it negatively.

One must evaluate the effectiveness, timeliness, and quality of technical assistance provided through WASH, through the long-term advisor, and by the team of domestic advisors. This evaluation includes a review of its terms of reference, systems and procedures for its reports, etc.

One must specifically define the relationship of the project with the Target Strategy of USAID/Ecuador as regards the utilization, efficiency, and continuity of family and health planning services and the level of coordination of the project with the Cholera Response projects in rural areas (Project No. 518-0108) and Child Survival and Health (Project No. 518-0071).

Finally, the evaluation team must draft specific recommendations to maximize the development and impact of the project and for the time after PACD.

C. Evaluation Methodology

The evaluation team hired through John Snow, Inc. was made up of Dr. Reinaldo Grueso, Specialist in Health Policy Analysis/Team Coordinator; Dr. Enrique Gil Bellorin, Specialist in Health Training and Education; and Engineer Andres Karp, Sanitary Engineering Specialist. These professionals got to know each other and met for the first time on their arrival in Quito. On the first day, they had an opportunity to familiarize themselves with the technical capacity, experience, and specialty of each of them; they discussed their work styles, they identified the functions of the coordinator and each member of the team; and they analyzed and made decisions on the possible work plan and on administrative matters, secretarial support, transportation, and office space.

Subsequently, and during the first day, they met with the Chief of the Health Division of the USAID/Ecuador Mission, Dr. Ken Yamashita; Dr. Patricio Murgueytio, Project Manager for the AID; and Engineer Adalid Arratia, WASHED Project Coordinator. During that meeting, they discussed the scope of the work to be done (Annex A) for the evaluators and they set

the dates for the presentation of the project and the orientation of the evaluators by the Coordinator and the domestic project advisors. Once this orientation had been received, a work plan was prepared (Annex B) which was discussed and adjusted during an orientation session held with officials from the Mission in charge of project evaluation.

The evaluation methodology included meetings with authorities from the Ministry of Urban Development and Housing and the Ministry of Public Health, the Ecuadorian Institute of Sanitation Works, with the domestic advisors and directors and individuals in charge of project components on the central level as well as those from the eight provinces and with individuals in charge of basic sanitation projects on the rural level through the World Bank, the United Nations Development Program (UNDP), and the Inter-American Development Bank (IDB). The list of persons interviewed can be found in Annex C.

A review of documents relating to the project, such as: Project Paper, technical and progress reports on the project, technical and administrative standards generated by the Ecuadorian Institute of Sanitation Works, work operations plans and other documents relating to the project were reviewed by the evaluation team. A detailed list of these documents is presented in Annex D.

An important part of the evaluation consisted of visits to the provincial offices in Carchi, Cotopaxi, Tungurahua, Azuay, and El Oro plus 13 communities in which Project activities were being developed. Annex E presents the list of these communities broken down by provinces, their demographic features, and the degree of emphasis in the work done by project components. These communities were selected on the basis of information supplied through the Diagnosis and Inventory of Water and Basic Sanitation Systems conducted in each province through the Project. Here are the selection criteria that were used:

a) Ensure representation of Indian and mestizo communities;

b) Ensure representation of communities in cold, temperate, and hot climates;

c) Make sure that work was done by two or more components of the project;

d) Make sure that they had different water supply systems using gravity and pumping and diverse water treatment processes and different degrees of complexity;

e) Make sure that they included at least one regional system that covers various communities;

f) Make sure that they had latrine construction programs;

g) Make sure that they were not more than one hour's drive by car from the provincial office of the Ecuadorian Institute of Sanitation Works and that they

would permit one inspection visit by the evaluation team lasting at least two hours.

As for the selection of the provinces, they included indices on the Indian and mestizo population in the mountains and the mestizo population on the level of the coastal region. This latter criterion led to the selection of the province of El Oro as representative of Ecuador's coastal population whose racial characteristics and lifestyles are very different from those observed in the population settlements in the mountains.

It is important to point out that the evaluators selected the communities in a completely free fashion and according to their own judgment. However, the evaluation group put its trust in the advice given by the Ecuadorian Institute of Sanitation Works personnel on the provincial level as regards accessibility of the communities.

For the visits to the provinces and communities that were selected, visit guides were drafted for each component and they were adjusted according to the experience the evaluators had in each type of community (Annex F).

At the end of each day, the evaluators met to comment on their findings, to exchange information, and to solve problems they had detected during the implementation of the methodology or its instruments. Besides, in order to standardize the evaluation process, the visits to the communities were made in a combined fashion in three provinces and, in the remaining two provinces, the evaluation team split up to cover the communities that were selected according to the above-mentioned criteria within the time programmed for the field visits.

III. INSTITUTIONAL DEVELOPMENT: FINDINGS AND RECOMMENDATIONS

A. Component Design

During the project design process, both USAID and the Government of Ecuador, represented by the Ecuadorian Institute of Sanitation Works, recognized three great institutional deficiencies that had to be tackled through the Project. These deficiencies were as follows: (a) a weak management capacity on all levels aggravated by a limited number of trained officials in this area; (b) excessive centralization when it came to decision-making and development of activities; and (c) inadequate systems to ensure recovery of costs with a view to financing the maintenance and operation of the systems of the Rural Potable and Sanitation Water System Construction Program.

The components for institutional development were defined on the basis of the above situation. In this definition effort participated both officials from USAID and the Ecuadorian Institute of Sanitation Works who determined the scope of this entire undertaking as well as the technical assistance, material, and financial resources necessary to attain the goals established for it. Moreover, this process was aided by the evaluation of Project 518-0015 as regards the diverse technical and economic studies that had been prepared for this purpose.

One may conclude that the project design process was acceptable based on a partly appropriate diagnosis as regards selection of activities or component, objectives and anticipated products, and the timetable for completion of activities and supply of programmed resources.

B. Implementation of Institutional Development Component

1. Improvement of Management Capacity on the Central and Provincial Levels

In the opinion of project evaluators, the strengthening of the Ecuadorian Institute of Sanitation Works is the result of the coordinated and synergic action of all project components. When new systems and procedures are drafted for the development of an institution, they must be tested, discussed, and accepted and they must then be properly set up within the institution by the authorities of the entity that receives this effort.

Starting with the above, the project with the technical assistance of WASH held a workshop to launch the project and administered a training program in the field of Management Development for personnel on the central and provincial levels; this program was carried out in three phases, each of which featured a workshop lasting an average of five days.

The first project launching workshop lasted three days and was attended by 39 officials from the Ecuadorian Institute of Sanitation Works and USAID plus the technical assistance team.

This workshop was intended to familiarize the participants with the basic outline, strategy, role, and goals of the WASHED Project and to get the officials to make a commitment toward the success of the project through the definition of possible actions for project implementation.

The management development program carried out in three phases with the participation of the technical assistance team, the chiefs of the project components on the central level, the directors and second representatives of the eight provinces covered by the project (29 functionaries) had the objective of improving the management capacity of the participants by imparting knowledge and supplying basic instruments for the communication, organization, and delegation of work, the setup of work teams, personnel management, monitoring, and evaluation of the decentralized operation with delegation of functions.

In addition to the above, the Project with the technical assistance of WASH staged two monitoring workshops for the project itself attended by the directors and second representatives of the provinces, the chiefs of the components on the national level, and the technical assistance team. The first workshop was held in July 1991 and was attended by 33 persons; the second one was held in September 1992 and was attended by 30 persons. Both workshops lasted three days. They spelled out the performance indicators for the project in general and for each component and they marked the contents of the project progress reports.

It is important to stress that the entire management training process was characterized by very adequate sequence, that the methodology used is very appropriate and generates very active participation in the students involving the use of teaching materials, that is, case studies that are adapted to the situation of the Rural Potable and Sanitation Water System Construction Programs in Ecuador. With the exception of seven provincial directors who left their posts as a result of the change of government administration in August 1992, the majority of the trained officials currently remain in the Ecuadorian Institute of Sanitation Works; this ensures continuity for the effort made through the project. During the evaluation process, it was possible to determine that 56.6% of the officials attended the three phases of the program, even though they remained within the Ecuadorian Institute of Sanitation Works. Upon being interviewed by the evaluation team in the five provinces visited, 100% of the trained officials stated that the workshop and the instructors running it stood out by virtue of very good technical and teaching quality.

At the time the evaluation was completed, the project launched a new management development course for the seven new directors of the provinces covered by the project for five additional provinces not programmed in the project and for 13 second and third representatives not trained previously. This new course will have two phases. The first will take place during a period of eight days in February 1993 and the second one will last five days in June 1993.

2. Stepping Up Decentralization

One of the project's goals has been the organization and operation of the so-called operating modules for the decentralized drafting and execution of construction projects. In this sense, the evaluation team was able to ascertain that in all provinces visited,this type of module had indeed been formed; the modules accomplished their function primarily in projects financed through USAID whose fund transfer had been made to the provinces. Right now, the provincial chiefs have authorization to order expenditures up to $30 million [sucres] directly and up to $60 million [sucres] with authorization of the next-higher chief. According to the provincial chief of Cotopaxi, Official Record No. 54, dated 27 October 1992, regulated and legally strengthened this type of delegation.

On the other hand, according to the Financial Director of the Ecuadorian Institute of Sanitation Works, it currently has the legal power to transfer on the provincial level the monies of FONASA and of the Ecuadorian Institute of Sanitation Works in order to carry out construction works projects approved by the central level.

However, the provincial chiefs continue to express their dissatisfaction over the excessive paperwork and the delay in the transfer of funds from the central level. All of the provinces visited indicated that during 1992 the only funds available for field activities were those supplied through the WASHED Project. One of the provinces visited reported that, ever since the month of May 1992, its personnel did not have funds to do any work on the level of communities not covered by the WASHED Project.

It is important to point out that the new administration that took over in August 1992 made the change in the subordination of the Ecuadorian Institute of Sanitation Works from the Public Health Ministry to the Ministry of Urban Development and Housing; therefore, the decentralization process is being studied by the new authorities with the prospect of converting the Ecuadorian Institute of Sanitation Works into a standard-issuing and supervisory entity and handling the construction activities through contracts with the private sector or non-government organizations--ONGs. However, on the level of the Ecuadorian Institute of Sanitation Works and thanks to the experience accumulated through the project, we do have trained personnel who could be employed in this new type of function.

3. Improvement of Cost Recovery System in the System of the Rural Potable and Sanitation Water System Construction Program

As a consequence of the training and operating and maintenance components, this undertaking was construed by the evaluators as being the process of training Ecuadorian Institute of Sanitation Works personnel on the provincial level and the Community Water Boards so as to improve their management, to set rate schedules, and to get the communities to do their own financing for the operation and maintenance of the systems. Within this frame of reference, the evaluators visited the communities and rated the management capacity

of the Community Water Boards as being an effect of the project's institutional and management development program.

All chairmen, treasurers, secretaries, and, in two cases, the office employees (systems in the province of El Oro) in the 13 Community Water Boards interviewed did receive training through the project. This training effort was carried out through seminars or short training courses lasting three days. The training content was oriented toward the importance of potable water and latrine construction as regards the health of the population, the improvement of the use of these services, and general concepts of the administration of the systems. According to the attendees, these courses and seminars were very interesting and helped them in improving their management on the level of the Community Water Boards.

However, the evaluators were able to observe that there was a lack of basic policies, criteria, and information when it came to setting rate schedules as well as determining salaries for the operators and other personnel.

The accounting and treasury processes carried out by the Community Water Boards revealed a wide variety of forms and blanks which in many cases, due to their complexity, could not be kept in an adequate form by those responsible for this type of work. Besides, simple indicators of a financial and administrative character had not been developed; those are the indicators that would permit the Community Water Boards themselves to monitor their own management and make decisions, such as how to collect on delinquent accounts, setting special rates, determination of rate schedules for industrial use, and others. In all communities, persons were found who use water for microindustrial purposes (for example, making cement blocks) and who have a high consumption but who pay the same fees as the rest of the users for basic consumption and excess consumption. Out of eight communities visited, it was found in five of them that 10% of the users were more than two months behind in the payment of their fees; two communities had 20% of their users in arrears and one community had 85% of its users behind in their payments.

All communities visited depend on action by the Ecuadorian Institute of Sanitation Works to fix their rate schedules and when these officials cannot visit them due to lack of per-diem or transportation, these rate schedules can remain frozen for long periods of time.

The training program for the members of the Community Water Boards was not drafted on the basis of a prior study to determine the strong points and weak points of their administrative processes and to figure out the performance and skill level of their members. The program was evenly balanced in terms of its objectives as well as the content, intensity, and methodology employed in the teaching process for all of the Community Water Boards.

From the political viewpoint, it was plain to see that in all communities, although the systems are considered to be their property, nevertheless, the Ecuadorian Institute of Sanitation Works is responsible for paying for their maintenance and repair when the community cannot do so. Moreover, some Ecuadorian Institute of Sanitation Works officials

believe that this type of subsidy is fair and necessary, even though in many cases there is no information on the ability of the users to pay and on the system's maintenance and operating costs. (See Section 7.3.7 pertaining to the study of rate schedules and operating and maintenance functions of the systems for Rural Potable and Sanitation Water System Construction Programs).

C. Technical Assistance for Institutional Development

Technical assistance for this management development component is being supplied through the WASH Firm and through the coordinators and the domestic advisors of the project.

The WASH Firm has been charged with carrying out training activities in the management field and for project monitoring. In reviewing its project progress and monitoring reports and the teaching programs and materials used during the training process, one can conclude that the technical competence, methodology utilized, and the quality of the advisors assigned have been on a very good level. It must be stressed that one and the same advisor directed this entire process; this facilitated a systematic, continuous approach based on a broad knowledge of the conditions of the institution that wishes to strength itself and the environment in which it is located.

On the other hand, all provincial and central-level officials interviewed--who had attended the various workshops--underscored the very good quality of the advisors charged with administering training. The timeliness with which the WASH Firm has been taking care of the technical assistance requests was determined by the progress of the project and by requirements set up by virtue of the fact that the project was coordinated and managed by the Ecuadorian Institute of Sanitation Works.

As regards technical assistance provided by the coordinator and the domestic advisors, one may observe that this assistance revealed good quality; but it did not feature the intensity required so as to make for a better follow-up in terms of management development on the provincial and community levels. Although the coordinator and the project advisors made several visits to the provinces, it is felt that the requirements for monitoring the planning processes, the community studies, and the development of the components demand a tightly scheduled and well-defined program timetable for domestic technical assistance. One reason given by the central technical assistance group in trying to explain this situation has to do with the fact that, in 1992, they concentrated on drafting the standards and procedures while the actual implementation phase will be conducted in 1993.

There is no doubt that the coordination and information, planning and management capacity strengthening mechanisms for the provinces and the Community Water Boards require heavier concentration of efforts on the part of domestic technical assistance. These efforts must be so tailored as to measure the effectiveness which each component displays on those levels to determine the specific management weak points that must be tackled through

training or supervision and to define better support for the Community Water Boards. The above activity will make it possible to modify and adjust the training and supervision aspects as implemented by the province through the operating and maintenance as well as training components.

One very specific suggestion made by various officials in the provinces that were visited had to do with the need for getting training in management development. It was hoped that the provincial chiefs and the second representatives after receiving training would become instructors for their own subordinates. This did not happen and, therefore, domestic technical assistance has a wide field of action in order to accommodate this request.

Designing an adequate information system for the operating and maintenance program as it was conceived in the project draft assumes special importance. Technical assistance must be concerned mostly with shaping up the system starting with an inventory of information needs, periodicity of information, the level on which it will be used, the type of information user, and the hardware configuration. Likewise, one must define the software and a training program for the system's operators and users.

D. Impact of Institutional Development Component

Management training provided through the project as described above had some positive effects and displayed some major weaknesses in the processes relating to leadership, planning, monitoring, and coordination as well as information on the part of the Ecuadorian Institute of Sanitation Works at its central and provincial levels.

As for the leadership and management area of the Ecuadorian Institute of Sanitation Works on its various levels, the project did--through training--stimulate the establishment of a management style that complies with the chain of command but that, in turn, offered teamwork with the subordinates in order to draw up agreements on work objectives and on the identification of solutions to organizational and functional problems. This goal was attained within the group of the Ecuadorian Institute of Sanitation Works in charge of the diverse components of the project, although its focus featured very little by way of integration and interdisciplinary approach. One notes that each component, in particular, did good teamwork, whereas the components did a rather poor job when it came to activities of an integrating character. This observation also applies to the provincial level. In all provinces visited, each component carried out its planning, execution, and monitoring processes in a vertical pattern and they worked with the goal of seeking synergic action by the components on very scarce occasions. On the central level, the participation of the Directors of Basic Sanitation, Finance, Human Resources, and Planning was limited to the appointment of a few representatives for each component. As a result, the group leadership process will not be instituted on an organizational basis in other projects or units of the Ecuadorian Institute of Sanitation Works.

As for the planning and monitoring system which is geared toward institutionally organizing operations planning that is based, among other elements, on community studies and low-cost and effective technological undertakings as well as the establishment of a series of indicators that would verify the plan's progress and make it possible to introduce adjustments on the operational level in an opportune form, one may well say that this system was not as successful as had been hoped. In the judgment of the evaluators, the annual project operating plans were drawn up in a very centralized manner. Generally, the provinces forwarded their aspirations to the central level and that level in the end decided what was to be done and what projects were to be carried out in each province. Furthermore, the central level makes an evaluation of those activities and programs that remain yet to be carried out. There is no evaluation as to the attainment of objectives, nor as to the impact. During their visits to the provinces, the evaluators asked for the annual provincial operating plan of the project and none of them was able to show such a plan since there is only a national project operating plan.

As regards the monitoring system, a very strong effort was made to generate and use a group of indicators so as to evaluate procedures and determine activity completion and accomplishment. Unfortunately, this system was not instituted on an organization-wide basis for other Ecuadorian Institute of Sanitation Works projects and programs.

Looking at the coordination and information aspects, there are various findings that need mentioning. On the central level, coordination between the Project Coordinator and the group of national advisors and the Ecuadorian Institute of Sanitation Works Manager and the component chiefs in most cases was very good. There were some problems that were resolved in the health education component. This can be explained in the light of the change in government administration in August 1992; this process was altered a little bit both on the central and the provincial levels. However, this process has been improving gradually as the new authorities become familiar with the project in greater detail.

On the provincial level, the coordination system primarily boiled down to group meetings arranged in a separate form by the provincial chief with the individual in charge of each component. These meetings do not have a formal timetable and are held in keeping with the needs of each group. In practice, there is no coordination mechanism for pulling the various components together. Each component works in a very vertical pattern.

The Province of Cotopaxi is a special case; it has a Coordinating Committee chaired by the Provincial Chief of the Ecuadorian Institute of Sanitation Works; in it participate 13 institutions of a multilateral and bilateral character and non-government organizations that work in the Rural Potable and Sanitation Water System Construction Programs and that are making an investment close to 2,000 million sucres in 1993. This committee has managed to work out a very voluminous exchange of experiences between the projects. In this sense, one must note the adoption of the health education system under the WASHED Project by UNICEF. That also prevented the duplication of efforts and it ensures very significant complementarity between all of the participating entities.

A consortium of Community Water Boards has been set up in that province; it consists of 63 Community Water Boards with a subscribed operating capital of more than three million sucres derived from a contribution of 50,000 sucres by each Board. The main function of this consortium is to produce sodium hypochlorite on a small scale and to set up a system for the procurement of other basic raw materials for the operation and maintenance of the Rural Potable and Sanitation Water System Construction Program systems at wholesale prices offering better quality. Besides, as a result of the fact that UNICEF donated some chlorination equipment, the consortium is selling prepared chlorine to the communities; this facilitates the chlorination process. The consortium is a private entity and received support from WORLD VISION to the tune of 22 million sucres for the construction of a warehouse. This entity was created four months ago.

As for information, all provinces and the central level have been equipped with computers and printer (Project No. 518-0015), and they are in the process of assembling a network and interconnecting these equipment items via modem. The use of these resources varies widely on the provincial level. In Cotopaxi, the equipment was received a year ago and it burned while being installed, so that it was necessary to repair it at a very high cost. This equipment was damaged over a period of four months. In Tungurahua, the equipment is being used by the group of hospitals of the Ecuadorian Institute of Sanitation Works and one drive is damaged. The equipment is being used excellently in Carchi. The provincial office has put in automated programs to maintain the budget, the warehouse inventory, and the personnel roster, and to support all of the project's components. Right now, three persons are handling the equipment. Lamentably, an electrical discharge burned the modem in this province. The equipment is being used in the Province of El Oro for certain accounting uses and to prepare financial and warehouse inventory reports for the central level.

It follows from all of the above that, although there is a group of computer that later on will make up a network, nevertheless, there was no idea as to what kind of information system was to be set up. There is not the slightest doubt that the Ecuadorian Institute of Sanitation Works requires an adequate management information system and that the definition, the components, and the configuration of said system must be tackled through the project. The evaluators gathered the impression that there is great improvisation in this field.

E. Prospects for the Institutional Development of the Ecuadorian Institute of Sanitation Works

As mentioned earlier, the new administration which came into office in August 1992 ordered the relocation of the Ecuadorian Institute of Sanitation Works as a division of the Ministry of Urban Development and Housing which has also been created just recently. This determination was made by the Cabinet as stated by the Under Secretary of Public Health in talking to the evaluators.

In an interview conducted with the Minister of Urban Development and Housing and the Undersecretariat of Environmental Restoration, it was learned that the Ecuadorian Institute of Sanitation Works will be reorganized in the near future and that it will work more as a standard-issuing, supervisory, and technical assistance agency in the area of the Rural Potable and Sanitation Water System Construction Programs. The new Ecuadorian Institute of Sanitation Works will not do any construction work directly but will instead contract the services of the private sector and non-government organizations for construction and operating and maintenance projects. Besides, it will delegate the administration of the Rural Potable and Sanitation Water System Construction Programs to the municipalities; in those cases where the latter do not have the capacity to handle that job, it will deal directly with the communities. This operating change will be accompanied by a reduction in the personnel force which is currently considered excessive.

The above approach by authorities in the Ministry of Urban Development and Housing is shared by the Under Secretary of Public Health, who believes that it is absolutely indispensable to take out of the Ecuadorian Institute of Sanitation Works everything pertaining to the construction and maintenance of the health infrastructure, which must be absorbed by the Ministry of Public Health.

Complementing the above situation, the World Bank and the United Nations Program signed a loan agreement with the Government of Ecuador during the second week of February 1992 to boost the basic health services, that is, FOSBASE. This loan includes a slice of 13 million dollars for the construction and rehabilitation of the Rural Potable and Sanitation Water System Construction Programs in the rural area of five provinces and for the support of the effort to boost the water and latrine construction subsector. The loan will finance a national inventory of Rural Potable and Sanitation Water System Construction Programs and of the entities that work in this subsector on a nationwide basis, along with a study on the expectations and payment capacity of the communities that do have Rural Potable and Sanitation Water System Construction Programs. These studies will formulate specific recommendations for the institutional organization of the basic sanitation subsectors and for the purpose of setting the rate schedules for the Rural Potable and Sanitation Water System Construction Programs which will have a great effect on the reorganization of the Ecuadorian Institute of Sanitation Works.

To implement the loan as it relates to the Rural Potable and Sanitation Water System Construction Programs, the Public Health Ministry will sign an agreement with the Ecuadorian Institute of Sanitation Works so that the latter may provide technical advice and, if the terms offered by the Ecuadorian Institute of Sanitation Works are advantageous as compared to other alternatives, it will assign to it responsibility for the construction or rehabilitation of the systems. The Public Health Ministry and the World Bank will try to involve the private sector, the non-government organizations, the Provincial Councils, and the municipalities for the construction, rehabilitation, maintenance, and operation of rural systems within the Rural Potable and Sanitation Water System Construction Program. The Basic Health Services Project will cover 40 health areas out of the 160 existing in the

country currently and located in five provinces. Three of these provinces--Imbabura, Pichincha, and Azuay--which are currently covered by the WASHED Project will be taken care of through the Basic Health Services Project.

On the other hand, the Inter-American Development Bank is currently studying a loan to the Province of Pichincha to be channeled toward the rural systems within the Rural Potable and Sanitation Water System Construction Program. This loan will be handled through the Provincial Council.

The above-described context will, within the next few months, involve the Ecuadorian Institute of Sanitation Works in a profound reorganization process that will require very active participation by the Government of Ecuador and the Congress of the Republic; this is so because this institutional reform must be approved by a law. While these decisions are being carried out, the Ecuadorian Institute of Sanitation Works will experience a state of uncertainty that will affect its performance.

It is also important to point out that the new functions to be assigned to the Ecuadorian Institute of Sanitation Works in the future will change the content and shift the emphasis of efforts undertaken for the sake of institutional development that are currently being mounted through the WASHED Project. If the law approves the functions outlined by authorities in the Ministry of Urban Development and Housing, the new Ecuadorian Institute of Sanitation Works must be trained in efficiently to contract for the execution of works projects with the private sector, provincial councils, non-government organizations, and other institutions so as to standardize and supervise the activities of the public and private entities that are working in the basic sanitation subsector and to provide high-quality and timely technical assistance to the municipalities and the rural communities.

F. Recommendations for Institutional Development

1. Management and monitoring training efforts must be continued on the provincial levels. We understand that, as we go to press in the month of February 1993, it was decided to have WASH and project coordination carry out some training seminars in each province for personnel involved in the development of the components. The idea is to remedy the weakness observed by the evaluators as they met with officials responsible for setting up components who had not been trained previously.

2. Define the information system for the operating and maintenance component, including the design of software and applying it in the two provinces by way of a trail run. This support could be financed with funds that are not used to hire 30 promoters and they will serve to hire one national advisor for a period of four months, as well as for the purpose of training personnel in the use of the system.

3. Draw up a program of support for the provinces through project coordination and the domestic advisors; this program should be properly channeled and should have objectives covering the management processes that are considered to be of priority significance. The following can be suggested in this respect: organization of provincial coordination and information committees; institution of operating and maintenance standards; evaluation of the impact of the training of members of the Community Water Boards and amendment of training and supervision programs on the basis of this evaluation; establishment of a monitoring system to manage the Community Water Boards; discussion of results deriving from the study of rate schedules and charting strategies for implementation on the community level; definition of standardized instruments to carry out the treasury and accounting processes on the level of the Community Water Boards.

4. Document the decentralization process on the basis of experiences obtained through the project and propose a manual of standards and procedures for the authorities of the Ecuadorian Institute of Sanitation Works. This documentation is of great importance to the future reorganization of the Ecuadorian Institute of Sanitation Works and must be prepared through project coordination and national technical assistance in conjunction with the directorates on the central level and the provincial chief executives.

5. Reinforce the planning and monitoring process on the provincial level through quarterly meetings that will evaluate the operating plans and that will be attended by all officials who carry out the programs.

6. Through Project coordination, draw up a program of information meetings with leading project officials, FASBASE [Basic Health Services], the Public Health Ministry/World Bank, and the United Nations Development Program, as well as the person in charge of basic sanitation projects in the Inter-American Development Bank to assess the progress being made in these projects and ascertain the political and technical positions of these institutions as related to the reorganization of the basic sanitation subsector and the Ecuadorian Institute of Sanitation Works itself.

7. Promote establishment of a Project Steering Committee chaired by the Under Secretary of Environmental Restoration and made up of the directors of basic sanitation, finance, human resources, and planning, the project manager from the Ecuadorian Institute of Sanitation Works, the Project Coordinator and Project Manager from the AID. The main functions of this committee would be as follows: (1) approval and amendment of operating plans on the basis of quarterly evaluations; (2) decision-making for the organization-wide introduction of standards and procedures relating to decentralization, operating and maintenance functions, as well as the health training and education components and periodic monitoring of project progress. It is proposed that this committee meet at least once a month and keep the members informed on progress being made in the organization of the Ministry of Urban Development and Housing on the restructuring of the Ecuadorian Institute of Sanitation Works and on coordination with other public and private entities and basic sanitation projects on the rural level.

IV. TRAINING, FINDINGS, AND RECOMMENDATIONS

A. Component Design

The training component was designed within the project on the basis of two main criteria: (1) improve the technical and management skills of personnel on the central and provincial levels; and (2) introduce new management practices and develop technical skills in innovative areas included in the project (decentralized handling, health education, research on and development of appropriate technology, tackling pilot projects and impact evaluation). Training would be aimed at meeting the needs of the project itself and would be tailored for persons who had relationships with project activities and who were responsible for success in attaining its objectives. The intention of setting up the Training Unit, organization-wide, on the basis of lessons learned during project implementation is also one of the project's goals.

Although the Ecuadorian Institute of Sanitation Works has a Human Resources Directorate that, among other things, is responsible for upgrading and training the personnel of the agencies so as to improve their leadership and management capacities on different levels, the training component was conceived as a parallel and independent unit of this Directorate, handling the resources coming from the project without any relationship or coordination between them.

When the project was being drawn up, the following were listed as the anticipated final project products: (1) training 2,288 Ecuadorian Institute of Sanitation Works officials and 5,768 persons coming from the Community Water Boards, health promoters, and rural teachers in operations and management and in health education; and (2) have an effective training program in management, operations, and maintenance as involved in the systems of Rural Potable and Sanitation Water System Construction Program duly set up as an institutional part within the Ecuadorian Institute of Sanitation Works.

B. Implementation of Training Component

To be able to attain its objectives, the training component was organized shortly after the other components. In the beginning, it was difficult to establish coordination with the rest of the components and with the provincial levels; this is why a chief and a technical advisor, plus three specialists were appointed and they were assigned certain provinces, plus a component support secretariat.

The component's specialists were trained while the project was underway under the oversight of the component's chief and advisor who are professionals offering a high professional quality and who were successful in putting together a very capable team, although there is quite a bit of trouble due to the rather tight physical space they occupy and the difficulties they had in getting transportation at the start of the project.

1. Planning the Training Component

On the central level, one might find that there is annual activity planning which is line with the logical and dynamic objectives and that tends to provide dynamic impetus for the component. This process begins with the identification of training needs, the definition of training policies, and the incorporation of informal adult education methodology; during the last year, this leads to the staging of training events and the implementation of evaluation and follow-up on the community level. The above is supplemented with the supply of audio-visual equipment and teaching support materials on the provincial levels. However, one frequently encountered problem has to do with the fact that the funds requested for these events do not arrive in time and that generates a gap in activities.

The planning used for the component is a very important aspect of the project. There is general consensus both on the central and the provincial levels that before the project came about, training sessions were held without any planning, there was no participatory methodology, nor was there any support from the central level in the form of appropriate resources.

The evaluation team observed one objective that is repeated in all annual operating plans. This involves the organizational setup of the Training Unit within the organizational structure of the Ecuadorian Institute of Sanitation Works; this is something that has not yet been achieved as of this moment. Quite logically, this cannot be an objective of the component itself because what is required here is a policy decision that must be worked out through project coordination and management.

The information used by the central level for planning purposes is derived from the necessities listed by the provincial levels and by the training requirements of the other components. The central level sets up the topics, the objectives, the contents, the time frame, the evaluation, and the facilitators, adapting the contents to the above-mentioned necessities and requirements. The provincial level takes care of contacting the persons who are to be trained, as well as all of the logistic support and the collaboration of some human resources as facilitators.

Planning on the central level has already been done for this year of 1993, although the provincial level has not managed to detect the necessities due to lack of financing to enable the coordinators to move around. The fact that the 1993 plan was drawn up before the basic information was available was justified by the statement that for budgeting purposes, this planning had to be submitted in the month of September. It is probably wrong not to include in the plan those activities that relate to the detection of needs on the provincial level at the proper moment.

On the provincial level, it was observed that there was no planning of provincial-level activities, nor were there any periodic meetings between all of the project's components and the Provincial Director. The work plan that is being used is the central level's work plan

that includes all activities of the eight provinces, in spite of the fact that it is on the provincial level that training needs are detected and the latter are subsequently reduced on the basis of budget allocations as set by the central level for each province. This situation has generated a great degree of nonconformity on the provincial level since, on certain occasions, activities are suspended which were more important for them than others. The evaluation team feels that the provincial level should always draw up its reprogramming on the basis of activities approved by the central level. In the future, there will have to be more participation by the provincial level in the selection of events holding the highest priority.

2. Guidelines for Programming Training Events

The basic information used by the provincial level in determining the training sessions to be held are as follows: information on new Community Water Boards, new system operators, needs of other components, and a questionnaire gathering general information from persons getting training. This questionnaire includes some questions on training received and on what the future event attendant needs to know and needs to do. This is what is called detection of necessities; that is done by the provincial coordinator as he visits the different communities.

The central level should issue some guidelines for staging these events, such as:

a. putting together an advance questionnaire for attendees so as to collect information on knowledge, beliefs, and practices in relation to the training topic. The data in this questionnaire are very helpful in drafting the content course, as well as in measuring knowledge acquired after training;

b. stricter selection of attendees because there are cases where the same individuals attend different courses several times because they are members of particular Community Water Boards and also because they are considered to be community leaders;

c. determination of the number of attendees per community since one or two leaders are selected in some provinces, whereas as many as 15 leaders are picked in other provinces; that deprives the leaders of other communities of an opportunity to receive training because each event can handle a maximum of 30 attendees;

d. the communities from which the community personnel come for training must be covered by promoters so that there may be a follow-up to determine the results derived from training received.

3. Training Component Coverage

It has been possible to train approximately 30% of personnel on the institutional level after three years of component implementation not considering the fact that the majority of them received various training phases, in other words, that in each phase, they were considered to be a more trained person. On the other hand, it has been possible to train approximately 43% of the programmed community personnel.

On the basis of estimates in the project design, the evaluation team believes that the target of persons to be trained was very ambitious, if one keeps in mind the component's installed capacity. It must be remembered that the majority of the initial activities were carried out in their entirety by the central-level team and that it will be necessary to wait for the development of the operational capacity on the provincial level in order to be able to get greater coverage provided the funds are approved and transferred in good time.

On the other hand, as we review the second main objective of the component--which is the institutional incorporation of the training program within the Ecuadorian Institute of Sanitation Works--one can observe that this is a fact on the level of persons involved in the project, while this is not so on the level of the institution as a whole; this explains the repetition of this objective in all of the component's annual operating plans.

4. Training Component Coordination

On the provincial level, it was observed that the component coordinator is generally a promoter who, in functional terms, has assumed responsibility but who does not have an official appointment and who nevertheless continues to carry out promotion, construction, and works supervision activities. In several cases, this official also acts as coordinator of the health education component.

Supervision of this resource both by the central and the provincial levels is facilitated by the definition of a job profile that has already been drawn up and disseminated through the component.

The evaluation team feels that a single official can adequately and efficiently coordinate the training and health education components since the majority of the training activities carried out on the community level are implemented by the promoters who are under the health education component and because the actual training sessions are being directed by persons who come from communities where the health promoters are carrying out their activities.

The component has carried out a series of training activities on different levels and for different types of officials and individuals. The details on the training of the Provincial Directors and Community Water Boards are described in Chapter 3, Institutional Development.

The training courses, seminars, training workshops for provincial coordinators, promoters, community leaders, rural teachers, and family mothers had adequate contents and the methodology of informal adult education has been an innovation within the organization. Acceptance has been very good on the part of the institution's officials and the community. Attendees report that they achieved greater comradeship, greater motivation due to the techniques used, and due to the learning generated by the training events.

It is worth mentioning that other necessities cropped up during this stage of the project, among which we might mention the following:

a. One must include leadership and management topics in training courses for the provincial coordinators of the components. Right now, these are officials who have skills for planning and developing training events, but it is necessary to boost their capacity so as to ensure self-sufficiency within the policy of decentralization.

b. It is necessary to incorporate topics of epidemiology that will allow the provincial levels in a simple form to know how to collect information so as to analyze it and use it in the decision-making process and in the evaluation of the impact on the health of the communities served by the project.

c. All training sessions must end with the preparation of a provincial operations plan or with the monitoring and evaluation of their operating plans, so as to reprogram activities and to ensure the practical application of knowledge learned and to improve the adequate development of the component or the project in general.

d. It is necessary to establish the mechanisms of coordination with the Education Ministry so as to be able to include the topics of water and sanitation in the school curriculum on a mandatory basis. So far, many rural teachers have been training, and a large number of training slots were also programmed for 1993; but, when the Provincial Education Supervisors, the school principals, and the trained teachers were interviewed, it was noted that the practical use of this knowledge depends on the free will and particular interest of each teacher and that they generally apply this knowledge in the area of "association of classes," which is not a mandatory subject.

e. Training given to community leaders and housewives must also end up with a work plan that is based on their health problems and on activities necessary to resolve those problems as well as on the responsibilities of each member. It must be kept in mind that the participation of the facilitator in this case only comes in the nature of support. The plan must be drawn up by these individuals themselves and must be based on the resources and capacities of the communities. One must avoid something we were able to observe in one

leadership training course in one of the provinces visited; here, the necessities were tied in with requests for aid from the Ecuadorian Institute of Sanitation Works, the municipality, and the provincial councils, but at no time was this tied in with the actual performance of activities on the level of the community and on the basis of the responsibility of these people themselves.

f. In courses given to promoters, it is necessary to develop the community participation topic in depth. They handle the concept of community participation in the light of the cooperation given them by the community and its leaders so as to be able to do their job. In some cases, they even went so far as to cut the supply of water to the family that does not build a latrine or that does not go along with the recommendations of the promoter. It is necessary to make sure that the promoters will implement community study techniques, such as: in-depth and focal-group interviews. As of now, the information they gather is valid and important, but as the project progresses, it will be necessary to develop some topics that are within the health education component more in depth. It must be remembered that the health education process is dynamic and it is necessary to monitor it permanently in order to make pertinent adjustments.

The majority of the provinces were given material to build up a small library; in some provinces, that library is being used to keep a permanent training effort going. The promoters are the main users of this material.

The provinces recently received audio-visual support equipment consisting of a television set and a VHS [VCR], a slide projector, and an overhead projector. It would certainly also be worth the trouble to deliver a set of slides and films to be used during the training sessions to be developed.

5. Training Component Monitoring and Evaluation

The component has prepared a series of process indicators that were being applied with much success during the project's three years and that show that the goal attainment percentage is high with the exception of some activities that slip out from under the direct responsibility of the component and that, more than anything else, call for a political-administrative decision by project coordination and management.

So far, evaluations have been done for each training event through a guide developed by the component. However, what is being evaluated here is, above all, the methodology, the facilitators, the work environment, and logistic support. No evaluation is made as to whether the persons learned anything; this could be done by means of a questionnaire that would serve not only as a diagnostic evaluation but also as a bottom-line evaluation.

On the other hand, there have been no follow-up and evaluation activities concerning the results of the training sessions that were held during the project's three years because the component's provincial coordinator did not have any travel and per diem expenses allocated to him for that activity. Central-level specialists visited the provinces mostly in support of planning and to stage training events.

It is believed that supervision for the year 1993 must be the most important activity to be carried out. Since the provincial level has the capacity to develop the training events, central-level specialists must devote more time to visiting the communities where training activities were carried out for the purpose of evaluating the impact of the training that was given. Likewise, there must be a follow-up on and evaluation of the trained institutional resource. This follow-up and evaluation activity will be very useful in preparing the training manuals for the different groups incorporated in the project.

Much care must be taken so as not to fall into the routine of administering courses or training workshops only in order to attain a certain goal and without knowing whether the students are really learning what they are expected to learn and whether they are actually using what they learned; there are many experiences in other countries that have for many years been developing a large quantity of training courses at high cost on all levels, although the knowledge imparted was never put to practical use.

The information system used by the component includes complete documentation on every training event from programming up to evaluation. The documentation is prepared by the provincial-level coordinator who then forwards it to the central level.

The computer donated through Project No. 518-0015 is very helpful on the central level; all of the component's activities are being stored there in a systematized form. This situation does not exist on the provincial levels although they have assigned computers. Feedback from the central level to the provincial level is not immediate; instead, it takes place when the specialist visits the province to plan the next event.

6. Standard Products of the Training Component

A document called "Training System" has been drafted; it contains the objectives, strategies, the philosophical context, organizational structure, technical support, and basic processes within the training system; this document was disseminated to the different operating levels. It was prepared at the start of the project using ideas only from the central level, and it was very useful in guiding and backing the activities carried out by the provincial level. However, this document must be enriched with the results of follow-up activities and evaluation of training administered as well as the field experience now acquired by the provincial levels. On its basis, one can now draft a "Manual of Standards and Procedures of the Training Component."

C. Technical Assistance Provided for Training Component

Technical assistance supplied through WASH has been very effective and timely when it came to putting the component together, developing and disclosing its central methodology, staging the training sessions, and monitoring the process in order to provide feedback for the component through specific and point-related reports.

Local technical assistance, plus field experience, added up to adequate follow-up on the recommendations generated by WASH advisory activities and also was able to generate its own recommendations as a result of the follow-up on the component itself.

D. Recommendations for Training Component

1. Major efforts must be made so that, on the basis of the guidelines from the central level, the provincial level will be able to work out its own annual operating plans and will get adequate and timely financing.

2. Follow-up and evaluation of training courses given both for institutional-level personnel and community-level personnel must be done during 1993.

3. On the basis of field visits by the central level and the provincial level, it will be necessary to review the contents of the training activities carried out by the different community groups so that these groups may become really operational elements.

4. The conceptualization of community participation within the component must be reviewed and must move on from cooperation by and utilization of the community toward planning, execution, and evaluation done by the community itself with the technical support of the health promoter.

5. By the end of 1993, there must be a first draft of what could be the "Manual of Standards and Procedures of the Training Component" that could be used within the Ecuadorian Institute of Sanitation Works, regardless of whether or not the institution is the executive agency or the standard-issuing source or the regulating body of the water and sanitation sector.

6. The "Training Manuals" must be available by the end of 1993 primarily for the Community Water Boards and the Potable Water System Operators.

V. HEALTH EDUCATION: FINDINGS AND RECOMMENDATIONS

A. Component Design

This component has some antecedents that are worth mentioning and that happened before the development of this project.

The National Health Education Program (PRONAES) was organized in 1988 with a new strategic social marketing focus as a result of a financing agreement with AID intended to cover the country's 21 provinces.

This stage began with the conduct of surveys on knowledge, attitudes, and practices in five provinces; they supplied information for drawing up the 12 project goals; seven were on the community level and five were on the school level. Messages to be transmitted by radio and television were developed to attain the goals; these messages were to be complemented by interpersonal communication activities.

After this methodology was evaluated in 1989, it was recommended that some changes be made and they were included in the WASHED Project which is the subject of this evaluation.

The WASHED Project notes that the health education component will provide continuity for social marketing but with greater emphasis in the eight selected provinces which is why a long-term expert will be hired in the field of communication, plus a short-term consultant with a specialty in cultural anthropology and communication. The component will boost the National Health Education Program and community-level activities through the inclusion of health education, operation and maintenance, and construction of systems within the Rural Potable and Sanitation Water System Construction Program.

To do the work on the community level, it was proposed that 35 of the old Ecuadorian Institute of Sanitation Works promoters be converted into health education promoters and that they support the program in the eight provinces. On the national level, each promoter would be responsible for ten communities; and to support the eight provinces, covered by the WASHED Project, 70 promoters would be contracted with AID funds. Each of these promoters would be responsible for five communities. Through the Community Water Boards, the promoters would have to select a woman on the community level who would be a health education coordinator and who would serve as support and link between the promoter and the community.

It was decided that some initial research be done in one or two provinces within the project to explore the current hygiene practices and to outline future educa[illegible]n activities in the region. The interpersonal and mass media communication activities and the messages would have to be tried out during the following year and the results would be evaluated. These findings would provide feedback for the national program during the project's lifetime.

The health education program would be aimed at communities that are building or that have water and sanitation systems; it was hoped that they would be more receptive because of that. The promoters would coordinate the "operational modules" to be constructed, the identification of these communities, and they would formulate their educational activity.

Two final products would be set up for the education component: (1) improve hygiene practices and promote changes in behavior through communications messages and techniques; (2) strengthen the institutional capacity of the Ecuadorian Institute of Sanitation Works so as to plan and implement a health education program.

Once the implementation of the new project had been launched, the eight provinces to be covered were picked and the 12 goals contained therein were amended. Three general objectives and four specific objectives of the component were drawn up, assigning greater importance to interpersonal communication and using the mass media as backup for the other activities.

B. Implementation of Health Education Component

This component has had a traumatic past record because it had to cope with lack of support and credibility on the part of the higher levels. Besides, during the component's development, it had five chiefs; that did not make it possible to get any follow-up and continuity for activities and it encumbered coordination with the Health Promotion and Education Department of the Ecuadorian Institute of Sanitation Works. This lack of generation meant that the component was being run parallel to the structure of the Ecuadorian Institute of Sanitation Works.

On the other hand, the component's activity is based on anthropological studies that supply recommendations on possible work to be done on the community, provincial, and central levels and that generate information on the beliefs, knowledge, and practices of the population in relation to water, use of latrines, and the disposal of animal excrements; these studies have not yet been completed. Also included was the hiring of women-promoters to achieve greater closer between the component and the family mothers.

One of the consultant jobs done by WASH significantly marked a new stage of the component due to some anthropological studies that made it possible to define a new methodological approach on whose basis a series of activities were developed with greater dynamism and functional effectiveness.

This component will be set up in different areas of responsibility, to wit:

(a) Administrative

(b) Training

(c) Research

(d) Production of Materials

(e) Supervision

(f) Planning and Evaluation

1. Health Education Component Planning

One can note that there are annual operating plans of the health education component and that the entire team from the various areas of responsibility on the central level participate in their preparation. The activities which the central-level team has programmed are carried out during the development of this annual plan. On the provincial levels, it was found that there is no annual planning and what is done actually boils down to a list of activities that are carried out weekly. That is what the component's planning on the provincial level boils down to.

Weekly meetings are held on the provincial level, generally on Mondays, to discuss the preceding week's activities; each promoter spells out the activities she will carry out during the following week. It was noted that there is no uniformity of criteria as regards the frequency of these meetings. In some provinces, they are held every 15 days and, in others, every month.

On the other hand, the activities spelled out for the week are the product of the promoter's needs or decision, and they are not based on a prior meeting with the community for purposes of coordination. It happens many times that somebody in the community goes to the provincial level to request a talk for his community and the promoter must refrain from going to the programmed communities in order to meet this new commitment.

It is considered necessary to begin to work with the community leaders so that they may learn that activities must be programmed and carried out with their active participation. If they are taught this process, there will be an annual operating plan in the end and it will spring from the community and reach the provincial level for consolidation.

To carry out the above-described activity, the central level will beforehand have to supply the provincial levels with clear strategic guidelines on which the activities to be programmed in the operating levels will have to rest.

There must be uniformity as to the periodicity of the meetings of the promoters on the provincial level aimed at programming of activities. One monthly meeting may possibly be sufficient to monitor the activities and to program the following activities. This would reduce the office work of the promoters by four days during the month and they could then use the available time for community-level actions.

So far, the project has not attained the objectives listed in the initial document. What one can perceive is that those activities are being carried out (in progress) through which it is hoped that the final products will be attained.

As for the objectives set up for the annual operating plans, it can be noted that some are repeated each year; they are more in the nature of objectives in line with the component as a whole and they constitute the project's final products. It would be worth the trouble to review this situation and to see to it that the component will have specific objectives by responsibility area and for each year and that the sum total of all of these efforts would lead to the attainment of the project's overall objectives. The above will enable the component better to orient its activities, to endow its development with greater dynamism, and to cut the execution times for some activities that are of vital importance to the component, such as, for example, the area of research and design as well as production of educational materials.

On the other hand, it is observed that some of the objectives fall within the training component; this is possibly due to the fact that, inside the health education component, there is an area called instruction that is or should be another activity of the training component.

2. Conduct of Social-Cultural Studies

The central level has been coordinating social-cultural research and has transferred the responsibility of getting the information to the level of the promoters; that includes different tasks, such as: identification of leaders, determination of habits relating to the use of latrines, personal hygiene, food hygiene, water, domestic animals, waste, infrastructure of the Ecuadorian Institute of Sanitation Works, expectations of the community, and as regards environmental recovery plus opinions on the health education program. This activity which falls within a second phase (the first one lasted six months) made it necessary to develop some topics in depth; this is why we are currently collecting more information here. So far, approximately one year has been devoted to this research.

It is felt that this is one of the component's most important activities because it will serve as basis for charting a new, more specific education strategy. Regrettably, this has dragged out longer than anticipated. At any rate, if, after this second information collection phase, it should be required to develop some aspects further in depth, we would recommend that a specialist in social sciences with experience in this field be preferably hired on a short-term basis, because this is highly specialized work that could not be done by the promoters in an adequate form and in a short time.

As we were able to observe in the 1993 plan, the analysis of the social-cultural information, the preparation of educational material, and training for the use of these materials have already been programmed. It is recommended that to be able to carry out the educational activities in an efficient manner and with a good impact, one must carry out a Communication Plan that will contain the following, among other things:

a. Target population to be reached.

b. Message to be given out in relation to the behavior or knowledge we wish to change or incorporate.

c. Channel to be used for dissemination of message to be accessible to the target population and characteristics of message.

d. Best time scheduling to reach target population.

e. Monitoring and evaluation mechanism for the message, the medium used, and the anticipated results.

Plans call for conducting a knowledge, attitudes, and practices survey during 1993. It would be worth indicating what the objective of the survey during this stage of the process really is, in other words (1) whether it will be to measure the results of what has been achieved as of now; or (2) whether it would be to obtain basic information before beginning the principal communication activities, so as to serve also as comparison for the moment when the activity has to be evaluated.

One must keep in mind that before conducting the knowledge, attitudes, and practices survey, it is necessary to make a field check on the instrument involved and to have a clearly defined sample of persons to whom the questions are to be put. We must not forget that the component has activities both for family mothers and for school children.

If we want to conduct the survey for the first-mentioned purpose, then one can conduct it in the project's communities as we had been thinking. However, if would be also worth the trouble to conduct it simultaneously in communities of the same province that have not been subjected to health education through the project so that they may serve as control group. On the other hand, if we want to conduct the survey with the second purpose in mind, then it would be advisable to conduct it only in the project's communities as had been programmed.

It must be remembered that the most important aspect of the knowledge, attitudes, and practices survey is the obtention of getting quantitative data that would be very useful for evaluation, whereas the data from sociological-cultural research are of a qualitative type and give us information that is much richer when it comes to charting education strategy.

We were able to observe that the topics included in social-cultural research are varied and broad which is why we would recommend that, when it comes to preparing educational materials and the message, the most important thing is to establish an order of priority of those areas that entail a major risk of sickness or death for children. The quality of the water, the use and adequate maintenance of the latrine may be most important among these areas; this may include making a sump to eliminate waste. In rural areas, the people use waste as a source of fertilizer for their crops, and they would never think of dumping it in a

hole. The above constitutes grounds for deep reflection and one should avoid providing a large volume of information featuring many topics and materials heavily laden with educational contents or very long-duration radio messages that, in the end, would lead to a greater investment in terms of time and money and a lesser impact.

The Information Bulletin that has been published is very useful because, in addition to disclosing the component's objectives and activities, it is providing information on results and recommendations in the operating field; this can only reinforce certain key weak points that are being detected on the provincial level. It is recommended that financing be ensured for continued publication and to provide an opening for the expression of opinions and experiences of other institutions that are working in the water and sanitation sector. We must evaluate the importance and use being made of this bulletin on the operating levels.

3. Health Education Component Coordination

On the provincial level, the component is represented by a coordinator who in most cases is also the coordinator of the training component; this situation is quite favorable since on the community level there is great interaction between these two components. It is believed to be a good policy of the project that the same person should perform the two functions and should have a steady position within the institution.

This coordinator and the promoters have clearly defined functions through a job profile that was prepared by the component on the central level. Although his appointment is purely functional and although the components on the level of the provinces have not yet been officially organized in a structural form, all of them have received training not only as "instructor of instructors," but, in other cases, as health promoters.

The role being played by this coordinator on the provincial level is that of director of evaluation meetings and activities programming and, with the promoters, preparation and forwarding of reports to the provincial and central levels. Right now, he is not engaged in any activities involving field inspections and direct supervision of promoters due to the lack of budget funds for travel expenses; there is only one person who reviews documents and who must accept what is written because that person cannot check it out on the community level and, what is even more important, cannot give the promoters any technical assistance.

In some provinces, the health education coordinator has also been assigned responsibility for covering five communities, just like the promoters. In these cases, this community care is not being provided because it would be difficult to discharge both of these responsibilities at the same time. If he is selected as coordinator, it will suffice to back him up by means of training so that he may adequately perform this function and so that he would not be assigned other responsibilities that he could not discharge.

On the provincial level, the coordinator meets only with the promoters. There is no type of meeting that would be attended by the entire provincial team and that could help monitor the

project, as well as provide coordination between components, solve problems, and manage the project responsibly.

4. Role and Impact of Health Promoters in the Health Education Component

The health promoters are the component's moving force on the local level. So far, 40 out of the 70 included in the project draft have been hired. Hiring was done in two groups which is why there were two training phases.

During field visits, it was possible to observe that the promoters assimilated the knowledge very well and are putting it to practical use. All of this has been facilitated because their school education level ranges all the way from high school graduation to university-level professional qualifications. The only inconvenience encountered in some provinces in the mountains is represented by the fact that none of the promoters hired so far understands and speaks quechua; this makes communication with the Indian communities difficult.

On them rest all of the group training responsibilities as well as activities involved in home visits, talks in schools, talks to the Community Water Boards, and to the community. The above is facilitated because the promoters spend the night in the community and can establish contact with family fathers and leaders after they return from their agricultural labors. This greater approach between the promoter and the community has given the promoters an opportunity to get a better knowledge of the population's customs and practices.

If the promoters were not being paid with funds supplied by USAID within the project, then there would have been no success and there would have been no community work in health education and training as currently presented by the Ecuadorian Institute of Sanitation Works. It is quite true that the Ecuadorian Institute of Sanitation Works has a corps of promoters; however, their activities are different and they are geared toward motivating the community for participation in the construction of works projects and delivering some educational talks while the construction process is in progress. After the works project has been finished, there is no educational follow-up through these promoters. Right now, they are not doing any work due to the lack of funding for construction work and in order to comply with their supervisory tasks.

It was possible to observe and perceive that there is a certain degree of nonconformity on the part of the other promoters when compared to the new promoters, because the latter have a budget coming from USAID for their travel expenses. Although in drafting the project it was established that the promoters would do the same work as the promoters, this was not done because the Ecuadorian Institute of Sanitation Works did not provide the necessary funds and because the older promoters felt that inspection visits to the communities take a great effort. At any rate, there is good acceptance of the health promoters by the provincial authorities who proved to be very satisfied with the work done by the former. We believe that we will gradually achieve total acceptance by the result of the personnel.

In drafting the project, it was decided that each promoter would be responsible for five communities; but it was forgotten that each community has a different number of beneficiaries and different access and transportation facilities; so, now we have promoters who are responsible for an average of 500 beneficiaries, while others have to take care of as many as 1,300 beneficiaries. As a consequence, there are promoters who are not adequately covering certain assigned communities. To this we must add the fact that some promoters who were selected to live in the rural areas close to the communities under their responsibility are now living in the provincial capital; this makes it difficult for them to maintain contact with the communities and to be punctual as they visit the communities.

The work being done by the promoters is intensive; they get to the communities and they have very good acceptance on the part of the organizations, leaders, and persons in the community; but they are overworked because the project's design was for the promoter to do her work with the support of the community leaders, the Community Water Boards, and the teachers. So far, it is the promoter who is doing the home visits, the talks during the Community Water Boards and in the schools. When the promoter is asked how she defines the participation of the community or the trained groups in her work, she says: by summoning the people to a meeting; sometimes, the operator accompanies her to the home visits and the teachers let her have the pupils for her educational work. As we can see, neither the community, nor the trained groups are doing a real job of providing support for the promoter since some of their members are trained to make home visits or present talks.

5. Degree of Community Participation in Health Education Component

In the component, there is a recommendation of the organization of the Local Health Education Committees, CLES, that are governed by a law passed by the National Congress. There is sufficient coincidence between the work of the promoters and the efforts of these Local Health Education Committees. However, the Local Health Education Committees are organizations that are imposed from the institution down to the community and at no time have they been a product of the community's suggestions. On the other hand, they are made up of leaders and professional members of the community (teachers, nurses, doctors, etc.) of whom one could only expect a certain degree of motivation for the community but not the systematic implementation of actions, properly speaking, because, above all, they have to discharge their own work responsibilities which demand that they use up all of their available time.

It is worth mentioning that health education activities in the province of El Oro are being carried out adequately and have been accepted sufficiently well by the community. In some cases, it is observed that the community does not participate in the "talk sessions" that are being organized. That is to be expected because these talk sessions are a custom and a group activity that is very characteristic of the mountain country where there are production systems that differ widely from those on the coast. In other cases, it was mentioned that the users do not attend the meetings and here we find another difference because, in the

mountains, a person who does not attend the meeting is fined, whereas along the coast, there is no such community pressure methodology.

To achieve greater participation by the people along the coast, it is necessary to study, observe, and be familiar with the production, organization, and cooperation systems of those very members of the community, the chain of command they abide by, the forms of intra-family and inter-family relationships, etc., in other words, one must not try to impose forms of participation that are alien to their customs.

It is necessary for the community actively to participate in these activities following a process of joint planning with it. The community and its trained groups must hold great responsibility in the execution of the actions and must even participate in the evaluation. Not only here, in Ecuador, but also in other countries, it so happens that the community leaders participate only as an entrance channel or as coordinators of activities in the community and that they only very rarely become involved in the activities directly due to the fact that they generally have various responsibilities within the community or, in other cases, they have lost credibility within the community. One must use the training session to include concepts drawn both from health education and from community participation to achieve a participatory action by the community and not just its cooperation. We know that these ideas are present on the central level, but it is necessary to implement them in practice, and they must be one of the objectives of the component for 1993.

As the community engages in educational activities, that does not mean that the promoter will not return to the community; on the contrary, her presence will be very important in everything relating to technical support which is required in those cases. This will make it possible for the health education program to become more efficient since the promoter will have an opportunity to visit many more than just five communities. If we continue to work the way we are working now, we would have a very expensive program that no institution would be capable of absorbing with its own funds.

6. Monitoring and Evaluation of Health Education Component

The monitoring and evaluation activities carried out by the central level are channel through the biweekly meetings which are attended by all team members. There is also an annual evaluation to determine the degree of completion of activities. It is necessary to develop some performance indicators that can help in monitoring and in the periodic and annual evaluations. It is difficult to evaluate the attainment of objectives because, as we said in the beginning, the component is implementing some overall objectives which can be measured only as the project is finalized.

On the provincial level, in addition to evaluating the accomplishment of activities carried out by the promoters, it will be necessary to keep on monitoring the results of the home visits. For example, the promoter would have to keep a record on the number of latrines she found to be clean upon her home visit and compare that number to the latrines she found to be

clean during her prior visit. Similar examples could be given for all of the education components; that would permit her to prioritize the community on the basis of the weak points in its knowledge and behavior patterns and she could decide on the periodicity of visits to each community and on the incorporation of new communities.

Currently, one cannot evaluate the component's impact because the majority of its activities are in the process of implementation. However, on the basis of the observation that was made at the field level, one can say that the latrines are found to be clean and that the people in the communities have a general knowledge on water and sanitation.

It is necessary to process all of the information deriving from social-cultural research in order to be able to come up with more specific and less general messages to be able to make sure that the people will learn not only the "why" but also the "because" and, in that way, one can ensure a more appropriate change in behavior.

In various communities, it is felt that the promoter is a latrine supervisor or watcher, resulting in the fact that the people clean the latrines because they know the promoter is watching and because a habit has thus been formed for this kind of action.

As regards supervision, it was found that the central-level supervisors are getting to the provincial level approximately every two months. In some provinces, this supervision has been very sporadic. One positive fact in this supervision is the trip to the communities to evaluate the work of the promoters; this has made it possible to get feedback and to support the promoters on the basis of the situation such as it really is. Supervision done by the central level is making up for the absence of accomplishment of this activity by the provincial level which does not exercise this kind of supervision due to Ecuadorian Institute of Sanitation Works funds to pay for per-diem and travel expenses.

The information system that is being used is very detailed because the monthly reports on the daily activities of each promoter are forwarded all the way to the central level. It was observed that the report will undergo various changes for this year of 1993. The coordinator will send a consolidated monthly summary of the work done by all of the promoters and that will be signed by the provincial chief. It is felt that this is a better way to receive information on the central level and it is also hoped that there will be feedback to the provincial level so that the local analytical and decision-making capacity may be strengthened.

During this coming year, it is necessary to devote more time to work on the level of the provinces and communities to boost the component's activities.

7. Development of Educational Material and the Communication Program

As of this moment, educational material has not been developed on the basis of the data from social-cultural research. Those that are being used are materials that were prepared before

the project or by other institutions; these materials are very much divorced from reality in some places and therefore interfere with the assimilation of the message.

The evaluation team knew that some radio spot announcements had already been prepared on the basis of some provisional information derived from social-cultural research with the support of the community leaders and the promoters and with the technical assistance of communication specialists. However, these radio spots were not heard in the radio stations.

In one of the provinces, it was learned that the radio stations are not very much in agreement with the idea of broadcasting these messages because they feel that they last too long for just one radio spot (3-4 minutes). This information must be confirmed and, with the radio stations, it is necessary to explore whether this really presents a problem. The evaluation team feels that a radio spot announcement is more effective by virtue of its compactness when it lasts 30 seconds at most.

A part of the health education program's success has to do with the feasibility level found in the home or the community when it comes to applying in practice what the educational messages are proposing. For example, in one community visited, the housing units did not have any water for eight days, and it was noted that all latrines were completely dirty. Quite logically, without water to wash the latrines, it is impossible for the community to keep them clean.

In other cases, one cannot ask the children to use the latrine if the opening of the latrine is very big and if there is no gradual adjustment system due to the danger of an accident. Nor can one ask the family to put used toilet paper in a container with a lid if there is no possibility of getting these types of instruments. The alternative which the Ecuadorian Institute of Sanitation Works had in terms of supplying these elements was a very correct decision. Regrettably, this effort was not continued and no though was given to other mechanisms that could pay for themselves.

8. Use of Latrines in Communities Visited

The latrines that were built are based on the "water flushing" system for the most part. These latrines are quite hygienic and do not present a bad odor provided they are adequately maintained. During the visits to the communities, it was noted that there is still a tendency to build the latrine in a spot that is very far away from the house; this makes it difficult to use the latrine during nighttime hours, during the rainy season, or simply because one has to walk a certain distance. Since this is a type of latrine that differs not much from those used in the cities, one must think in terms of building it inside the house or contiguous with the house; this would make it possible to ensure the adequate use and maintenance of the latrine.

In other cases, it was noted that the tank to store the water was taken out of the latrine and, on some occasions, out of the house. Another good alternative is to build an integrated unit

to facilitate the supply of water to wash the latrine and also to make sure that the hands are cleaned immediately after the latrine has been used.

In some provinces, it was found that educational and training activities are being pursued in the communities that only built the water system but that did not build any latrines.

C. Technical Assistance Provided for Health Education Component

International technical assistance provided through WASH has experienced some highly significant moments in the component and local technical assistance has managed to follow up on the recommendations that were made. We feel that for this year of 1993, when a series of very important project activities will be carried out, an opportunity should be provided for leading component officials to visit countries with excellent health education programs; or one could hire an international advisor who has experience in everything relating to community participation, drafting educational strategies, preparation of materials, and component evaluation.

D. Recommendations for Health Education Component

1. Support the provincial level in matters of planning, monitoring, evaluation, and supervision of the work that is being done on the community level.

2. Focus the work of the health promoters on the community level so that there will be greater participation of the families in the implementation of activities and so that it will not be just the leaders who participate as is happening right now. Move on from community cooperation to the implementation of activities by the community.

3. As soon as possible, finish the tabulation and analysis of results form social-cultural research so as to draft a complete educational strategy that will include its own communication plan.

4. On the basis of the social-cultural research data and with the participation of the community, prepare the educational material to support the activities being carried out by the promoter by the Community Water Boards, by the rural teachers, and by the women in charge of nurseries.

5. Implement the education strategy as soon as possible and have the communication plan monitoring and evaluation system ready. Remember that the assimilation of knowledge is a dynamic and changing process.

VI. APPROPRIATE TECHNOLOGY: FINDINGS AND RECOMMENDATIONS

A. Component Design

1. Description of the design of this component

It was stated in the Project Paper that:

> "The overall output expected from this component is a viable, institutionalized capability within IEOS to ensure that the RWS&S (APSR) systems it constructs are technologically and economically appropriate for their locations and users."

The design of this component of the project called for four Appropriate Technology studies to be undertaken and completed, and for their findings to be incorporated in the IEOS Rural Water Supply and Sanitation (APSR) program. The option of considering other studies was also part of the design of this component.

An interesting statement in the Project Paper, which sheds some light on the reasoning behind the design of this component, is the following:

> "IEOS and its advisors are aware of technological innovations which have been employed in other countries but... they are unwilling to simply adopt approaches used elsewhere without first testing their applicability in Ecuador, and perhaps making necessary modifications."

2. Evaluation of the design of this component

Two general comments about the design of this component are that, in the opinion of the evaluation team:

(a) The design of this component included some very worthwhile objectives and corresponding activities to achieve these objectives.

Specifically, the planned studies and investigations were very appropriate and useful activities;

(b) The design of this component failed to include some equally worthwhile activities which would have further contributed to achieving the desired overall output.

Specifically, the design of this component failed to include dissemination of information about appropriate technologies which might have been developed

or investigated by others. This might include both those in other countries, as well as within Ecuador.

The design of this component should have foreseen the possibility that IEOS employees at the Provincial level might have developed or investigated appropriate technologies on their own (in fact this has happened). In such a case the design of this component should have called for financing of workshops, seminars, manuals, etc., for the interchange of appropriate technology information between provinces.

(c) The design of this component should have called for a maximum of involvement by personnel at the provincial level.

The purpose of this would be to take advantage of the experience and knowledge which exists at the provincial level. It would also be to involve them from the beginning, since they will eventually be called upon to utilize whatever technologies the Appropriate Technology component of the project might conclude to be appropriate.

B. Technical Assistance

The technical assistance provided to this component of the project consisted principally of a full-time advisor who worked within the IEOS central offices, and of occasional visits by an international consultant from the WASH project.
The quality of the work of the full-time advisor is difficult to evaluate, because there was a change of personnel for this position, and because the process for selecting and monitoring research studies began slowly and in a less than optimal manner. However, his work has contributed to making the UCETA magazine high quality, and to research studies which are worthwhile and are now moving forward.

The WASH-consultant provided excellent advice. The evaluation team is in agreement with almost all of the observations and recommendations made in his October 1992 report, and this has been a very useful document for the purpose of this evaluation.

C. Implementation

This component of the project was implemented in a BETTER manner than what the project design called for, and has undertaken some very worthwhile activities. Nonetheless, it has had some shortcomings.

A Coordination Unit for Appropriate Technology Studies (Unidad de Coordinacion de Estudios de Tecnologia Apropiada) -- UCETA -- has been formed within IEOS to manage this component of the project.

It has published the magazine UCETA, with the first issue in late 1991, the second in 1992, and the third scheduled for March of this year. This is the only magazine or periodical published by IEOS, and it has become a useful means of disseminating information about all components of the project to personnel throughout the institution, in all provinces of the country. In this sense, it has gone beyond its mandate, in a worthwhile and commendable manner. On the other hand, the first two issues of the magazine have included very little about appropriate technologies, and all articles were written by people based in the capital. Thus the magazine has not taken the opportunity of being a means of sharing and disseminating information developed at the provincial level, or elsewhere (it should be noted here that although the evaluation team believes that this would be worthwhile, it was not called for in the project design).

This component of the project has also published three commendable technical publications. It may be noted that these have been largely based on studies undertaken by others, in contrast to the statement in the Project Paper that IEOS and its advisors "are unwilling to simply adopt approaches used elsewhere without first testing their applicability in Ecuador."

The study and investigation about improved latrine designs is nearing completion and has developed some design modifications which seem to be very appropriate.

A study and review of design standards is underway. This is a very worthwhile endeavor, but must be undertaken with care in consideration of both the importance of these standards, and the tendency for them to only be changed once every several years.

Three other research studies have been contracted to the National Engineering School (Escuela Politecnica Nacional), and are now underway.

A Pilot Monitoring Plan for Water Quality Control (Plan Piloto de Monitoreo de Control de la Calidad del Agua) has been initiated in coordination with the O&M component of the project.

UCETA has required some time to develop experience and skills for reviewing and prioritizing proposals for studies. Furthermore, the researchers that it has contracted have likewise required some time to learn how to conduct their studies in a manner that will result in practical and useful results.

There has been a tendency to enter research studies without adequately studying available publications on the topic to be studied.

In November 1990 IEOS sponsored a course in Cuenca, attended by personnel from throughout Ecuador, on wastewater stabilization ponds (Lagunas de Estabilizacion para tratamiento de aguas servidas). Although this was NOT done as part of the present project, it illustrates that IEOS was willing to take the initiative, and to finance, the dissemination of information about an appropriate technology, without the need to undertake a research study. Furthermore, IEOS has distributed a book which was developed for use in this course. IEOS should be commended for this effort.

D. Utilization

Because none of the research studies have yet been completed, approved, published, and disseminated, it is too early to evaluate the utilization of the outputs from this component of the project.

E. Impact

For the same reasons as apply to the utilization of the outputs of this component of the project, it is too early to evaluate their impact.

F. Perspectives for the Future

It is anticipated that several studies will be completed in 1993. Considering the care with which the topics have been chosen and the research has been conducted, it can be expected that they will have a positive impact on rural water supply and sanitation projects in Ecuador.

The evaluation team believes that some of the most important impacts will come from the latrine study and the review of design norms and standards.

The latrine study has already developed an improved design for a manual pour-flush basin (bacinete con arrastre de agua) which requires only about four liters to flush, instead of the approximately eight liters which designs currently used in Ecuador require. This should both make the latrines more practical, and should reduce the demand for water. The latrine study has also developed other innovations which should prove to be very beneficial.

G. Recommendations

1. Recommendation concerning appropriate technology

This component of the project should not limit itself to only research studies and the publication of its magazine and occasional technical reports. It should also become an information center for making EXISTING information on appropriate technologies more readily available to the IEOS provincial offices and to the construction and O&M components of the project. Additionally, it should expand its presently limited efforts as a facilitator of information exchange about appropriate technology throughout IEOS, and especially between the IEOS provincial offices.

An example would be the organization of workshops where personnel from the various IEOS provincial offices could share information about their experiences with appropriate technology, such as experiences with mechanisms for locally producing chlorine, and with ferrocement construction techniques.

2. Recommendation concerning the review of design norms

Completing this review should be given a high priority, but the quality of the results should not be sacrificed in the process.

In this respect, the evaluation team supports most of the recommendations made in the October 1992 report by the WASH consultant R. Octavio Cordon. However, the evaluation team would suggest that further analysis should be given to the "design period," and that the opinion of the WASH-consultant that 20 years is too long, should be carefully reviewed before accepting it. One factor contributing to our concern about shortening the theoretical design period, especially as it relates to the projected future population which a system must be capable of serving, is that many communities reach this population sooner than the designers had predicted. Shortening the theoretical design period would make this problem worse. Furthermore, there is a serious question about whether the institutional capability will exist to return to communities to expand their systems with more frequency.

3. Recommendation concerning chlorination

Consistent with the first recommendation above , UCETA should do a literature search to find information about appropriate methods for chlorinating water from pumped water supplies (methods which depend upon the "venturi effect" are appropriate for adding chlorine to the conduction pipeline between the well and the storage tank). This information should be provided to all provinces which have pumped systems, and especially to the El Oro office of IEOS.

The evaluation team observed an inappropriate chlorination technique in El Oro, where a "drip chlorinator" was being used to add chlorine directly to the bottom of the well near the

submersible pump. The high dose of chlorine at this location was causing rapid corrosion within the well.

4. Recommendation concerning coordination with others

Again, consistent with the first recommendation above , UCETA should become more responsive to the felt-needs related to appropriate technology, of the other components of the project, of the IEOS provincial offices, and possibly of other institutions working on rural water supply and sanitation in Ecuador.

5. Recommendation concerning research studies

UCETA should continue the worthwhile research studies that it is currently involved with.

6. Recommendation concerning visits to the provinces

UCETA personnel should include in their work-program and budget for 1993 increased trips to the provinces, in order to become more responsive to the needs and experiences in the field.

VII. OPERATION AND MAINTENANCE: FINDINGS AND RECOMMENDATIONS

A. Component Design

This component of the project was designed with useful and very worthwhile objectives, including:

(a) developing and bringing into operation an IEOS O&M program;

(b) developing, in each province, realistic O&M cost projections, and;

(c) revising user-fee rates and collection procedures to be self-sufficient.

The design of this component included the basic tenet that the beneficiary communities are responsible for the effective operation and maintenance of the water supply and sanitation systems constructed by IEOS."

It also stated "all costs of operating and maintaining the systems are expected to be paid for from the fees paid monthly by each community household receiving water."

The design of this component was adequate and appropriate, except insofar as it did not emphasize, or even mention, coordination with other components of the project.

B. Technical Assistance

The technical assistance to this component of the project was provided by both (i) a full-time engineer, paid by the project, who worked within the IEOS headquarters; and (ii) periodic consultancies by an engineer with broad international experience (who happens to be Ecuadorian), under the supervision of the WASH project.

The quality of the technical assistance was very good. This conclusion has been reached after reviewing several reports prepared by the technical assistance team, and interviewing both members of that team, as well as other participants in the project.

C. Implementation

IEOS has dedicated considerable effort towards developing and bringing into operation an IEOS O&M program.

1. Implementation: conceptual basis for O&M

The conceptual basis for the IEOS approach to ROUTINE O&M is appropriate, with all ROUTINE responsibilities (except training) remaining at the community level. However, the conceptual basis for NON-ROUTINE and EMERGENCY O&M is open to debate. For this type of O&M communities are encouraged to seek both technical and financial assistance from IEOS, instead of developing self-sufficiency.

2. National O&M plan

This Plan is still in draft form and has not yet been approved by IEOS. This is behind schedule because it must be consistent with the results of the User-fee Study (see sub-section below), which has been delayed. The draft Plan is appropriate in most respects, with the exception of some aspects related to User-fees and self-sufficiency in the poorest communities (see below), and the part of the Plan dealing with Environmental Protection (Vigilancia Ambiental, see below).

3. O&M manuals

IEOS has produced, and distributed to the provinces, an excellent O&M Manual for use by engineers and promoters. It has also recently produced a draft of a simplified version of this manual, for use by system operators. However, the simplified manual for operators has been produced behind schedule and has not yet been approved for distribution, although the more complete manual for engineers and promoters is already being used.

4. Pilot O&M projects in the field

In several provinces pilot O&M projects have begun in the field. These have emphasized testing of water quality using very appropriate portable test kits which were purchased by PAHO/OPS. However, there were not enough of these kits, and after much delay, the Project has recently purchased additional kits.

It can be anticipated that this work will improve when the community-level O&M Manuals become available in the near future.

It would be recommendable to provide all communities which chlorinate their water, with a simple and inexpensive test kit for measuring chlorine residuals. This is the only way to guarantee that appropriate amounts of chlorine are being added to the water, and it is much simpler than most of the other standard tests for water quality.

5. Training for O&M

IEOS has provided O&M training at all levels, including to professional personnel, O&M Promoters, system Operators, and members of the Community Water Administration Boards (JAAP).

This training is considered to be a success, insofar as the people trained generally understand how to accomplish their responsibilities related to O&M.

6. Diagnostic and inventory of existing systems

IEOS has developed a very useful and complete DIAGNOSTIC AND INVENTORY OF EXISTING WATER SUPPLY SYSTEMS (DIAGNOSTICO E INVENTARIO DE SISTEMAS DE AGUA POTABLE Y SANEAMIENTO RURAL) in the eight provinces covered by the project (it is also beginning to do the same in some other provinces). This has been undertaken using IEOS' own funds (without support from USAID), although it will be extremely useful for helping to accomplish the goals and objectives of the USAID-funded project.

This inventory includes information not only about the nature of each system (for instance, gravity-flow, pumped, chlorinated, etc.) and the population served, but also about the condition of, and repair requirements for, each component of each system. This inventory is an extremely useful tool for prioritizing the needs for system repairs, rehabilitation, and expansions. IEOS has computerized the information in this inventory for several provinces, and has applied a weighted approach to objectively prioritize assistance that it may provide to these systems.

7. Construction of warehouse-workshops (Bodegas-Talleres)

The warehouse-workshops financed by the Project are all either complete or approaching completion. In four provinces they are completed and functioning. In the provinces of El Oro and Pichincha they should be completed in May of this year. In Imbabura the land has been purchased, construction funds have recently been transferred to the province, and construction should begin within the next few days or weeks. In Tungurahua the land has been purchased, the construction plans and budget have recently been prepared, and it is anticipated that construction will be completed by about July of this year.

8. Rehabilitation of existing systems

This has not yet been undertaken, because of a lack of funding by IEOS in 1992. It is anticipated that significant rehabilitation work will be undertaken in 1993, although this will depend on funding being provided by the Government of Ecuador.

9. O&M cost projections

The user-fee study, discussed in the following sub-section, includes a reasonable procedure for estimating realistic O&M cost projections in each community. However, this procedure will not begin to be put into practice until later this year, pending prior approval by the higher authorities within IEOS.

10. Environmental protection (Vigilancia Ambiental)

In practice, it appears that the IEOS water and sanitation projects have rarely had significant negative impacts on the environment. In fact, they have frequently improved the environment, by installing and promoting the use of latrines, which have reduced fecal contamination of the environment.

In spite of the generally favorable impact of the water and sanitation systems on the environment, it should be pointed out that the IEOS approach to assuring that this will be the case is not adequate. The following points explain this conclusion:

(a) IEOS has asked its O&M Promoters to report on environmental problems, but only within the water-shed (sub-cuenca) which feeds the water source for the community. IEOS has not asked its O&M Promoters to report on possible negative environmental impacts either within the community itself, or downstream (aguas abajo) from the community;

(b) The questionnaire used by IEOS to collect field data for its Diagnostic and Inventory of Existing Systems (Diagnostico e Inventario de Sistemas de Agua Potable y Saneamiento Rural), does not include questions about the environmental impact of each system;

(c) The draft O&M Plan (Plan de operacion y mantenimiento para el sector rural del Ecuador) has an inadequate section on Environmental Protection (Vigilancia Ambiental). The problem is that this Plan does not assign or give final responsibility to any specific person or persons in relation to Environmental Protection. Instead it simply states in an overly-general way that EVERYONE should oversee ALL environmental concerns, and it does not go beyond this.

11. Chlorination

The most problematic component of the water systems has been chlorination.

Problems with chlorination should be put into the following general context. It must be recognized that, to the knowledge of the evaluation team, there is no simple, inexpensive way to chlorinate or otherwise disinfect water in rural communities, in a manner which will

be fully accepted and properly maintained in almost all communities. The best that can be hoped for is that with the choice of the most appropriate equipment, and with adequate training and education, most, but not all, communities may properly operate and maintain their chlorination systems.

IEOS has installed a standard drip-chlorinator (aparato de cloracion por gotas) in all systems. Technologically, this is the most simple and least costly type of chlorinator for water systems serving small communities. Nonetheless, it has the following shortcomings:

(a) The chlorine is relatively costly. This is the most important obstacle for achieving consistent chlorination.

For instance, it has been estimated that for some typical communities, the cost of chlorine amounts to about 220 to 250 sucres (about US$ 0.13) per family per month. This is a significant expense, considering that some communities resist paying monthly user-fees above about 300 sucres (US$ 0.17), and there are of course other O&M expenses to be covered. Furthermore, the operator must maintain the chlorination system, and the additional time that he devotes to this must be compensated for in his salary, which in turn must be covered by the user-fees. For instance, if the full-time work of an operator were to be compensated for with a salary of 80,000 sucres per month, and if he were to spend one hour daily dealing with the chlorination system, this time would be worth 10,000 sucres per month. If this were in a community with 100 families, it would add another 100 sucres per family per month to the O&M expenses.

(b) Some chlorination systems have O&M problems.

The evaluation team observed a few systems where the "float" devise was damaged or disconnected. This devise is necessary to assure that the chlorine is added at a constant rate. Where it was observed to be damaged or disconnected, the chlorine dosage inevitably varied during the course of the day, and probably was frequently inadequate.

(c) The drip chlorinator is not the most appropriate technology for use with systems which pump water from wells.

The evaluation team visited a system in the province of El Oro, where this type of chlorinator was being used to add chlorine directly to the lower part of the well, near the submersible pump. As a result, sometimes the chlorine concentration was very high, and this was causing rapid corrosion within the well. Since the storage tank (tanque de reserva) was elevated at 24 meters, it was not practical to add chlorine directly to this tank, as was done elsewhere with ground-level tanks.

The solution in this type of circumstance would be to use a chlorine dosing devise which utilizes the "venturi" effect and adds chlorine directly into the conduction pipeline between the well and the storage tank (tanque de reserva). Such a devise can be calibrated to add chlorine at an appropriate rate when the pump is functioning and there is a constant flow rate in the pipeline, and the devise automatically stops adding chlorine when the pump is shut-off and the flow stops.

12. Sophisticated Treatment Plants

The relatively sophisticated treatment plants that the evaluation team observed in five of the eleven communities visited, were functioning surprisingly well (with the exception, in three cases, of the chlorination component discussed above). These plants included aeration (in two cases), sedimentation or pre-filtration (in four cases), filtration (in all five cases), and chlorination.

Only one of these five communities (Las Lajas, in the province of Carchi) had an operator who did not work full-time. However, although this community had a filtration system, thereby qualifying it to be called a relatively sophisticated system, it had the purest water source and the least complicated system among the five communities, and therefore required less O&M than did the others.

The O&M for the treatment plants in the other four communities required a full-time, trained operator, as well as occasional assistance to the operator from other members of the community. This assistance consisted of several people from the community helping the operator to periodically clean system components, such as sedimentation tanks and filters.

In the four communities with full-time operators, these operators were paid 13,500, 30,000, 80,000, and 100,000 sucres per month. In the two communities paying the lower salaries, the chlorination systems were not working due to lack of money to buy chlorine, and in general the user-fees were too low, but nonetheless the operators worked full-time and maintained the treatment plants. However, the two communities which paid higher salaries paid adequate user-fees and maintained their chlorination systems.

13. Latrines

In all of the eleven communities that the evaluation team visited, manual pour-flush latrines (bacinetes con arrastre de agua) had been installed. In most cases these were made of concrete (concreto "marmoleado"), with fairly rough surfaces. However, porcelain pour-flush toilets (bacinetes) were also observed in some communities.

The most common problem observed with the pour-flush latrines was in cases where the water system did not always provide adequate quantities of water. In these cases, the latrines were not flushed often enough, tended to clog, and sometimes were not used.

The evaluation team tested the amount of water required to flush a few of these latrines, and found that it was about 8 liters. The need for such a relatively high quantity of water exacerbated the problem mentioned above when the water systems did not provide adequate quantities of water. It is important to note, however, the Appropriate Technology component of the Project has already responded to this problem, by developing, testing, and now recommending, a better design which only requires four liters to flush, and is made of porcelain. It's cost is within US$ 1.00 of the cost of the older and inferior design.

14. User-Fees

One of the goals of the project has been to remedy the problem of inadequate user fees. According to the Project Paper, one of the key outputs of the project was to be a "new user-fee tariffs system introduced in the eight provinces," by January 1993. This was to be preceded by "an evaluation research study of the user tariff situation focussing on social, economic and financial factors affecting the communities' ability and willingness to pay in relation to the financial requirements of the Rural O&M Program."

This project output is behind schedule, but implementation of new user-fees is anticipated to begin in the near future..

The required evaluation research study was completed in May 1992, and published under the title: "ESTUDIO TARIFARIO DE LOS SISTEMAS DE AGUA POTABLE RURALES -- INFORME FINAL." This is an extremely complete document, 105 pages long (in addition to annexes). However, the approval of the recommendations in this study was delayed approved, due to reservations initially held by the higher authorities in IEOS.

Since the proposed changes in user fees have not yet been implemented, the following comments only represent an evaluation of the research study.

The study's recommendations seem to be appropriate for communities with relatively "medium" incomes (S 120,000 to S 200,000 per family per month) and those with relatively "high" incomes (above S 200,000). Of course it may be anticipated that experience during the implementation of these recommendations may indicate that some refinement is needed, and for this reason the evaluation team would recommend that they be applied with some flexibility.

For communities with relatively low incomes (less than S 120,000 per family per month), it will always be more difficult to develop a scheme that will assure adequate user fees, and it therefore is not surprising that the evaluation team has some reservations about some aspects of the study's recommendations for this income group.

The study states (in Section 4 of the Executive Summary) that:

"Para las organizaciones tipo 3, en localidades de bajos ingresos), no se remunerara al Tesorero ni se establecera un fondo para ampliaciones y mejoras. Segun el grado de pobreza de la localidad, se podran establecer subsidios que podran ser proporcionados por el propio personal de la Junta; por organismos nacionales tales como el IEOS, la Municipalidades... etc.; o por organismos internacionales."

Our reservations include the following:

(a) When considering whether or not to pay someone, such as the treasurer, and when considering how much to pay workers, such as the operator, the study's recommendations only take into account the average income of the users. However, the NUMBER OF USERS who will share these expenses should also be taken in account, and, MOST IMPORTANTLY, THE AMOUNT OF WORK (HOURS OR DAYS PER MONTH) MUST BE TAKEN INTO ACCOUNT when deciding how much to pay someone.

(b) The above quotation from the study runs contrary to the statement in the Project Paper that"All costs of operating and maintaining the systems are expected to be paid for from the fees paid monthly by each community household receiving water... Successful implementation of an effective Operations and Maintenance program supported by this Project will require that the tariffs be increased substantially... (However,) even with increased tariffs, IEOS may be required to provide direct assistance with major repairs and repairs to water meters, without reimbursement by the communities."

The Project Paper did not explicitly state the justification for this requirement, but it is consistent with the following:

(a) A major subsidy is already being provided towards the construction of the water systems;

(b) Approving the construction of systems for which communities cannot afford to pay for O&M leaves open the major risk that some future government, within the next 20 years, will stop the practice of subsidizing such systems, and the resulting lack of O&M will cause the systems to fall into disrepair and possibly they will cease to function, and;

(c) There are not enough funds to construct systems for all of the rural communities of the country. In this context, any money used to subsidize the O&M of a system in one community, results in that much less money being available to construct a new system in another community. Thus a community which has already benefitted from subsidized construction, is taking away money that could be used for this same purpose in an equally needy community elsewhere.

D. Utilization

The O&M manual for engineers and promoters began to be utilized in 1992. It is now anticipated that the other O&M manuals, studies, and recommendations which have thus far been developed by the project, will begin to be utilized in 1993. Similarly, the inventory of existing systems will begin to be used in 1993 to prioritize assistance to communities for major repairs, rehabilitation, and expansion of systems.

E. Impact

Most system operators and water boards (JAAPs) have received training and understand how to accomplish their O&M responsibilities.

In other respects it is still too early to evaluate the impact of the O&M component of the project, because most of what has been thus far developed will only begin to be utilized this year.

F. Perspectives for the future

It can be anticipated that when the manuals, studies, inventory, and recommendations which have been developed by this component of the project are put into practice, this will have a positive impact on the O&M, and thus the reliability and sustainability, of the water supply and sanitation facilities which IEOS has built, and will build in the future.

G. Recommendations

1. Recommendation concerning subsidies for O&M

IEOS should carefully review its policies related to subsidizing the O&M of water supply and sanitation systems.

2. Recommendation concerning alternative technologies

IEOS should offer the option of using technologies which have lower O&M costs, such as handpumps, for communities which cannot afford the O&M costs for the type of systems which IEOS currently builds.

USAID should consider the possibility of authorizing the use of project funds to undertake the activities needed to accomplish this recommendation. However, considering that a World

Bank-funded project is about to begin, which has a similar component, efforts should be made to coordinate such efforts and to avoid duplication of efforts.

3. Recommendation concerning coordination of O&M work

The O&M component of IEOS' work should be better coordinated with other components, such as Training and Appropriate Technology.

4. Recommendation concerning community responsibility

The full responsibility for all O&M should rest with each community.

IEOS should continue to provide training, advise, and instruction manuals, but the communities should understand that they must pay for all O&M, and that they may seek assistance elsewhere (such as from the private sector).

5. Recommendation concerning the distinction between rehabilitation, expansion and O&M

Rehabilitation and expansion of systems should not be confused with O&M, and IEOS should clarify the terminology which it uses in this regard.

Although the same department of IEOS may be responsible for all of these tasks, it should differentiate between them. It should be understood that system rehabilitation, system expansion, and O&M, are three different things with different purposes, and different related work.

6. Recommendation concerning reviewing the diagnostic and inventory of existing systems

A review should be undertaken of a random sample of the information collected for systems included in the IEOS "diagnostic and inventory" of existing water supply systems.

This might initially be done for only about five percent of the systems included in the inventory, and might be expanded to a larger percentage of the systems only if significant inaccuracies are identified for this initial five percent. This should ideally be done by an independent consultant, to verify the accuracy of the inventory before basing important decisions on it. IEOS has already begun such a review, using its own engineers, but it has been limited by funding restrictions.

Note: The evaluation team did NOT see any indication of inaccuracies in the inventory information, except for some information being out-of-date. However, personnel in the Ministry of Public Health, who are working on a rural water supply and sanitation program to be financed by the World Bank, have stated that they do not trust the information in the

inventory and they would propose completely re-doing it. Considering this challenge to the veracity of the inventory,and considering that an independent review is always a good idea even when the information seems to be reliable, we would recommend the mentioned review of the data for a random sample of the systems.

USAID should consider the possibility of authorizing the use of project funds to undertake the activities needed to accomplish this recommendation. However, taking into account that a World Bank-funded project is about to begin, which has a similar component, efforts should be made to coordinate such efforts and to avoid duplication of efforts.

7. Recommendation concerning the prioritization of systems for rehabilitation

The following recommendation is particularly important, in view of the fact that approximately 40 percent of existing water supply systems are in need of rehabilitation (although most of the problems are not so severe as to put the systems completely out-of-service).

In addition to the many important factors which are already included in the prioritizing of rehabilitation of systems, based on the Diagnostic and Inventory of existing water systems, consideration should be given to adding the following factors:

(a) First, when prioritizing assistance to communities which have malfunctioning water systems, consideration should be given to the health impact of such assistance. For instance, if a system depends on a source of water which is badly contaminated, and the disinfection system is not functioning, assistance to this community should be given priority over assistance to another community where the problem relates to broken water meters.

(b) Second, an estimate of the per capita costs of providing the needed assistance should be included among the many other factors which influence the prioritization of assistance to communities which have malfunctioning water systems.

Furthermore, the tentative "weighted" analysis which IEOS is using to prioritize the rehabilitation of existing systems, should be modified as follows. First all systems should be divided into three groups: (i) those which are completely out-of-service; (ii) those which are providing poor service either in terms of quality or quantity of water; and (iii) those which are providing at least moderately good service, in spite of their defects. All systems in the first group should be given a higher priority than all systems in the other two groups, and similarly all systems in the second group should be given a higher priority than all systems in the third group. The weighted analysis developed by IEOS should then be applied to prioritize work WITHIN each of the three groups.

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8. Recommendation concerning environmental protection

More attention should be given to environmental protection.

This should include coordination with other institutions involved in reforestation projects, to assist in water-sheds (sub-cuencas) which provide water to community water systems, and which are becoming deforested. It has been observed that this is a frequent problem and is resulting in decreased water flows.

Although no serious problems were observed by the evaluation team related to negative environmental impacts from the IEOS water and sanitation projects, it would nonetheless be prudent to improve the environmental oversight (vigilancia ambiental) related to these projects.

9. Recommendation concerning user-fees

Consistent with previous recommendations and the basic tenants stated in the Project Paper, user-fees should be set high enough to at least cover all routine O&M expenses, regardless of how poor a community may be. User-fees should be understood to include both (a) monthly user-fees; and (b) occasional special charges (cuotas extraordinarias).

10. Recommendation concerning norms and regulation

Norms and regulations set by the government of Ecuador and by IEOS should be as flexible as possible, and should delegate as much authority as possible to the communities themselves.

It would be helpful for IEOS to develop model regulations which the individual communities could accept or modify based on their own judgments. This contrasts with the present practice of setting a uniform, rigid, and very detailed set of laws and regulations which all rural communities throughout the country must accept.

For instance, it is written into the law that water boards are to review user fees exactly once a year. Obviously, there are times when communities will need to adjust their user fees at a different frequency than this.

11. Recommendation concerning chlorination

(a) It would be very worthwhile to provide every community which chlorinates its water supply, with a test kit to measure residual chlorine in the water. This is one of the simplest and least expensive of the many tests which are commonly recommended for water supplies, and it is the best way to assure that appropriate concentrations of chlorine have been added to the water.

(b) In order to reduce costs, chlorination should not be required in systems where a sanitary survey indicates that the source of water is uncontaminated, there are no likely places for contamination to enter the system, and bacteriological tests indicate that the water is reaching the users without contamination. This recommendation is made in spite of the fact that there is no argument against the fact that chlorine can provide a "guarantee" that bacteriological contamination will be eliminated. However, the Project should be sensitive to the resistance of communities towards paying necessary fees for chlorine, as well as problems with the maintenance of chlorination facilities.

(c) The Project should promote the purchase of the apparatus already being used in some communities, to locally manufacture sodium hypochlorite (hipoclorito de sodio), because this can reduce the cost of chlorination to about one-third of what it would otherwise be (this cost includes the cost of replacing the apparatus every five years, as well as the cost of electricity and salt for operating it). It may be noted that the Appropriate Technology component has already tested and evaluated this apparatus, but only in the context of making chlorine for disinfecting vegetables. They have concluded that it is an appropriate way to make chlorine at an economical price. However, considering that this is a technology which has only recently been introduced into Ecuador, the O&M and the Appropriate Technology components of the project should both carefully monitor the impact of using it in rural communities, and should ideally do so for at least a couple of years.

(d) Alternative and more appropriate methods of chlorinating pumped water supplies should be introduced into the project.

(e) The O&M, Training, and Hygiene Education components of the Project should all work together to improve the operation and maintenance of chlorination equipment.

12. Recommendation concerning latrines

The new design for pour-flush latrines, developed by the Appropriate Technology component of the project, should be put into use as soon as possible for any future projects where pour-flush latrines are to be used.

VIII. CONSTRUCTION: FINDING AND RECOMMENDATIONS

A. Component Design

1. Description of the design of this component

The Project Paper stated that the Project Outputs related to systems construction would include the following:

a) IEOS Rural Water Supply & Sanitation -- RWS&S -- (APSR) system construction planning and management policies and procedures formally codified and adopted.

b) The decentralized Operational Module management system functioning for all RWS&S (APSR) system construction in the eight Project provinces.

c) Six hundred forty (640) new RWS&S (APSR) systems installed with ESF, FONASA and other IEOS funds in the eight Project provinces, providing potable water supplies and sanitary facilities to approximately 320,000 persons.

Furthermore, an IEOS province-level RWS&S (APSR) project selection, monitoring and evaluation system was to be developed.

System construction was to be financed as follows:

FONASA	$ 11.2 million
ESF	$ 1.6 million
Communities	$ 2.6 million

An interesting statement within the "Policy Issues" section of the Project Paper, which would seem to indicate almost a prediction about the possibility that the FONASA funds might not be forthcoming, is as follows:

> "With regard to point a. (availability of GOE counterpart funds for system construction), one of the Project covenants states that the GOE will provide to IEOS sufficient funds from FONASA, or other sources, to enable IEOS to carry out the project's rural water supply and sanitation system construction program... Yet, if for some reason all of these counterpart funds do not become available, the overall project purpose will still be met as the construction of new water systems is only one component of the project... If fewer new systems are built than planned, these objectives (related to the other project components) can still be met."

Another point depreciating the importance of this component in the design of the Project was that no full-time national advisor was assigned by the Project to this component.

Further depreciating the importance of the construction component was the following statement to the evaluation team, by the AID-IEOS Project Coordinator:

> "the spirit of the project was to assure the sustainability of water and sanitation systems," and the O&M component was therefore much more important than the construction component."

The evaluation team has to question whether all of this depreciation of the importance of the construction component was because people really believed that it was not very important, or if was because there was concern that this component would not achieve its objectives, and people were preparing excuses in advance!

2. Evaluation of the design of this component

The design of this component seems to have been appropriate and adequate.

The evaluation team considers this to have been a very important component of the project, in contrast to some of the statements quoted above. The team feels that it is not appropriate to belittle the importance of a component which was committed to constructing 640 systems which would serve 320,000 persons. The team feels this way in spite of the fact that it agrees that complete fulfillment of the requirements of this component was not necessary for the achievement of the objectives of the other components.

B. Implementation

1. Construction planning and management policies

Construction planning and management policies and procedures have been developed. However, the evaluation team did not verify if they have been formally codified and adopted.

2. Decentralized operational modules

The decentralized Operational Module management system is functioning for most RWS&S (APSR) system construction in the eight Project provinces.

C. Implementation of System Construction

IEOS has very much failed to come close to meeting its commitment of constructing six hundred and forty (640) new RWS&S (APSR) systems serving approximately 320,000 people.

Based on an analysis presented in the Annex to this report, titled "Rural Water Supply and Sanitation Systems Constructed During the Project" ("Sistemas de agua potable y saneamiento rural construidos durante el proyecto"), the following figures have been estimated:

	No. of systems		Total Population		Population per system	
	Pro-grammed	Imple-mented	Pro-grammed	Imple-mented	Pro-grammed	Imple-mented
ESF-AID funded projects:	80	52 (65%)	40,000	35,600 (89%)	500	700
Funded by IEOS and others:	560	106 (20%)	280,000	107,800 (39%)	500	1,000
Totals:	640	158 (25%)	320,000	143,400 (45%)	500	900

It can be seen that 65 percent of the number of systems programmed for funding by ESF-AID have been implemented, but that only 20 percent of those programmed for funding by IEOS and others (via IEOS) have been implemented.

Fewer ESF-AID funded systems were constructed than programmed, because the number actually constructed was as much as could be accomplished with the available ESF funds. The evaluation team did not investigate the amount of ESF funds that were spent. However it may be assumed that the reason that the funds ran out early was because: (a) the average system served 40 percent more people (700 instead of 500 people) than anticipated; and (b) the per capita cost may have been about 10 percent higher than had been anticipated when the project was designed.

Far fewer systems funded by IEOS and others were constructed than were programmed, because IEOS did not provide the amount of funding that it had committed to in the formulation of the project.

Although the figures presented in this chapter are estimates, they are the best data that the evaluation team could acquire.

This component was not monitored as closely as it should have been.

Note: As an indication of the lack of monitoring that has been given to the construction component, as well as of the misinformation that was circulating, the following is worth relating.

The evaluation team asked both the chief of the construction component, and the AID-IEOS Project Coordinator, if they could inform us of the number of systems that had been constructed during the Project. To the surprise of the evaluation team, we were told that no one knew this number, and that they would have to search for data from the various provinces, and dedicate a significant amount of time to determining this. The evaluation team considers this to be a failure to properly monitor an important component of the Project.

The AID-IEOS Project Coordinator told us that the best readily available list of systems constructed with ESF-AID funds during the Project, was contained in two lists published in the UCETA magazine (these are presented as Tables 1 and 2 in the Annex). These lists did not mention the dates when systems were completed. However, the evaluation team later determined that about one-third of the systems in these two lists were invested in before the signing of the Agreement (Convenio) for the present Project. In the end, the evaluation team had to conclude that these lists very much exaggerated the achievements of the Project.

IEOS eventually provided the evaluation team with the dates when each of the systems listed in the UCETA magazine were completed, and we were then able to determine how many systems were constructed as part of this Project. This information is presented in detail in the Annex.

1. Implementation: community selection

The IEOS province-level RWS&S (APSR) community selection, monitoring and evaluation system which was to be developed, has not yet been instituted. The reason given is that all ESF-AID construction funds were spent in communities which were selected before this project began, and now these ESF-AID funds have been exhausted. At the same time, almost no systems have been undertaken by IEOS with FONASA or other GOE funds, and there is already a large number of communities which were previously selected.

A draft document suggesting revised selection criteria has been prepared. However, its approval has been given a low priority because there is no point in selecting additional communities until more funding becomes available.

D. Utilization and Impact

Due to the implementation problems stated above, this component of the project has not been significantly utilized, and has therefore not had its full intended impact, except in the communities served by the limited number of systems that have been constructed.

The evaluation team visited very few communities where construction had taken place during the course of the present Project, and therefore cannot make a definitive statement about the impact of the new water supply and sanitation systems in these communities.

E. Technical Assistance

The main technical assistance to this component of the project was related to management issues. There was no technical assistance related to engineering aspects of construction, except for the indirect impact which the assistance to the Appropriate Technology component might ever have on construction.

F. Perspectives for the Future

The future of this component depends upon the availability of funding for construction. If such funding is becomes available, then this component could achieve its objectives.

G. Recommendations

The evaluation team recommends that IEOS provide the funding that it committed to for the implementation of the construction component, and that systems be constructed in a manner consistent with the design of this component.

IX. PROJECT'S IMPACT ON HEALTH

When the project was first devised, the problem was defined with the help of the data derived from the mortality analysis that was conducted by the strategic component on Infant Survival of USAID/Ecuador; it discovered the existence of high risks of infant mortality and birth as well as the poor quality of care and of the perinatal conditions, as well as malnutrition, acute respiratory infections, immuno-preventable diseases, as well as diarrheic diseases causing 20% of all of the deaths in children under the age of five years. The study also detected infant mortality rates ranging from 46/1,000 live births in Quito up to more than 80/1,000 live births in the rural areas of the mountains while some rural areas report an infant mortality rate of more than 100/1,000 live births.

This initial draft stated that to be able to reduce the sickness and death rate due to diarrhea, there would have to be adequate water supply, adequate sanitary facilities in the rural areas, and better behavior in terms of hygiene. At the moment the draft was prepared, 30% of the population had access to safe water, 20% had latrines, and hygienic practices in general were deficient.

As a response to this situation, it was decided to extend the coverage of the water and latrine systems and to change hygienic practice and water use. This solution is backed up by studies conducted by the World Health Organization between 1985 and 1986; these studies demonstrate that the water supply and sanitation programs have a substantial impact on the sickness rate involving diarrheic diseases. On the other hand, it was demonstrated in industrialized and developing countries that the infrastructure is not sufficient and that health education is essential to achieve health and to boost the economic value of action taken with respect to water and sanitation.

The prior USAID project (518-0015) was evaluated in March 1989. It was found that much progress had been made in construction systems, but that there were no changes to be detected in the infant mortality and sickness rates; this is why this new project should be boosted by hiring promoters who will carry out health education activities on the community level.

Looking at the project at this point in time, it is difficult to evaluate its impact on health due to various factors:

1. The various components are in the process of implementation.

2. The latest available data go back to 1990 (Infant Survival).

3. The information available on the sickness and mortality rates applies to the total province and is not broken down by community covered by the project.

4. There are no initial data on the sickness and mortality rates of communities where the project is in operation.

5. The selection of communities where the Ecuadorian Institute of Sanitation Works would be pursuing its actions was based on technical criteria and at no time on infant sickness and mortality rate criteria due to diseases originating in water and deficient environmental recovery.

6. The construction component has not been the direct responsibility of the project and there have been difficulties in constructing new facilities.

We think that the impact on health should continue to be the main objective of this project; this is why one must ensure the smooth operation of the components constituting it, primarily the component involved in construction, operation, and maintenance as well as health education. We think that due to the fact that the impact on health is very important for the project's justification, one must seek all necessary information on health in order to select the communities and not just the province and so as to have monitoring and evaluation parameters.

There is a bibliographical review done by WASH featuring 144 studies to quantify the effects of the water and sanitation projects on health; it revealed the following findings:

1. Improvements in water supply and sanitation cause noteworthy reductions in the sickness rate originating from water and sanitation.

2. Potable water and sanitation have a substantial impact on infant survival. Reductions of up to 55% in general infant mortality have been observed.

Since diarrhea is based on many factors and since there are parasite diseases (earth-helminths due to contamination of the soil, or water-helminths due to water contamination) that in addition to causing diarrhea, create grave complications, one must keep in mind that the important aspects in achieving major reductions in the sickness-mortality rate involve simultaneous actions that permit the following: (a) adequate water quality; (b) permanent water quantity; (c) technically appropriate excreta elimination systems; and (d) ensuring hygienic habits both as regards the storage, handling, and use of water and the use (primarily by children) and adequate maintenance of excreta elimination systems.

1. Recommendations for future projects

1. Continue to consider improvements in the population's health situation primarily the situation of the children as the project's final objective.

2. Get information on the health situation of the communities that are in the influence zone of the project and include the health level among the criteria for the selection of communities where the project will be in operation.

3. Get basic information on the health situation of the communities where work would be done with the project either through the collection of information in public or private institutions, or by means of the collection of information in the field through project personnel which would be very helpful in evaluating the project's impact.

4. Make sure that the project's main components (construction, operation and maintenance, and health education) are functioning adequately and in a simultaneously manner so as to be able to ensure the impact on health.

X. PROJECT MANAGEMENT AND ADMINISTRATION: FINDINGS AND RECOMMENDATIONS

A. Leadership and Coordination

In accordance with the Project Paper, the Directorate of Basic Rural Sanitation is responsible for planning and leadership within the Ecuadorian Institute of Sanitation Works as regards the systems under the Rural Potable and Sanitation Water System Construction Program. Therefore, its director initially served as the main counterpart of USAID in matters relating to project implementation.

This organizational structure which apparently was the most logical demonstrated that the communication channel with the provincial chief executives--responsible for the implementation of the majority of activities on the community level--was not routed along this line but through the Executive Sub-Directorate of the Ecuadorian Institute of Sanitation Works. This latter situation resulted in the placement of the project directorate on the level of the Sub-Directorate of the Ecuadorian Institute of Sanitation Works. After several months of excellent relations and smooth administration, the changes introduced in the Ecuadorian Institute of Sanitation Works created the need for setting up a manager with direct communication to the Executive Director and--starting with the incorporation of the Ecuadorian Institute of Sanitation Works into the Ministry of Urban Development and Housing--with the Undersecretary of Environmental Recovery.

USAID hired a project coordinator who would assist the Ecuadorian Institute of Sanitation Works in all matters relating to project implementation. This official furthermore was to be the point of contact between the Ecuadorian Institute of Sanitation Works and USAID for administrative purposes.

The above leadership and coordination scheme had various weak points. The first of them has to do with the frequent change of responsibility for the project on the level of the Ecuadorian Institute of Sanitation Works. The second one consists of the lack of participation of the directors of the Ecuadorian Institute of Sanitation Works in the processes involved in the approval of the operating plans, in the monitoring of activities, and, what is most important, in the decisions made to introduce the standards and procedures generated by the project into the organization on an institutional basis. This situation estimate was presented by the directors who were interviewed by the evaluation group.

As for Project Coordination through the official hired by USAID, his administrative action was of very good quality, timely, and always oriented toward the solution of problems that arose in project implementation.

One example of the type of difficulties to be tackled by Project Coordination is the current delay on the part of the Ecuadorian Institute of Sanitation Works in giving its approval for

the 1993 operating plan which was submitted for consideration by the Undersecretariat in November 1992. This situation is causing delays in the implementation of training, health education, and operating and maintenance activities in all of the provinces visited.

The incorporation of the Ecuadorian Institute of Sanitation Works in the Ministry of Urban Development and Housing definitely did cause various delays in the approval of the operating plan and the implementation of activities. These delays are caused by at least two factors. One of them has to do with the detailed review of the plan by officials who are in the process of being familiarized with the Ecuadorian Institute of Sanitation Works and the project as such, while the second one is tied to lack of transfer of budget fund increments allocated to the provinces to take care of the expenditures required for the implementation of the components.

From the technical viewpoint, project coordination has not had the necessary solidity. There are various deficiencies in all components. Among them we might cite the following: (a) lack of more effective coordination to ensure the integration of components; (b) very traditional planning process without strategic focus; (c) absence of adequate technical support program on the provincial level as far as the national advisory group is concerned; (d) limited follow-up and evaluation of possible project results on the community level; (e) lack of adequate evaluation process for the training component; and (f) absence of initiatives to devise and operate a management information system for the operation and maintenance component.

B. Technical Assistance

The technical assistance services required by the project have been provided through various mechanisms: individual service contract, institutional hiring of an Ecuadorian organization, Romero Associates, plus a buy-in contract managed through the Health Division of the Office of Science and Technology.

The Project Coordinator was hired directly by USAID for a period of four years starting in 1990. The Ecuadorian Institute of Sanitation Works participated in the selection of the professional who was hired.

Four long-term domestic advisors were hired through a system of competition between various engineering/management firms of Ecuador. The process for selecting the firms--which was the job of Romero Associates--was handled with the participation of the Ecuadorian Institute of Sanitation Works. This hiring process took effect in June 1990, the month that marks the start of work by the advisors hired for the areas of operations and maintenance (four years); appropriate technology (three years); training (three years); and health education (three years). It is important to point out that two advisors worked in the training component and that there have been five changes in health education since the start of this component.

All foreign advisors and some short-term domestic ones required by the project were recruited through a buy-in type of contract under the WASH III project handled through the Health Division of AID, Office of Science and Technology.

This contract began in April 1990.

In the light of all of the above information, one may say that the hiring of domestic and international technical assistance personnel was behind schedule by about six months; this meant that during the project's first year, there were no training and health education activities on the level of the communities. Likewise, management development training was approximately 12 months behind schedule.

C. Project Planning and Monitoring

As remarked in connection with the institutional development component (Section 3.1 of this report), the project during all of those years did have a national operating plan that--by component, province, and community--included the objectives, activities, time periods during which these activities were to be developed, persons in charge, and required budget. To draft these plans, the provinces were asked for their aspirations and the latter were analyzed by the central level which, in the end, decided which of them were to be approved. This process is questioned by the provinces that were visited since they did not have an opportunity to analyze--together with the central level--the rationality of the decisions made by the central level when it came to the allocation of resources and the approval of the projects.

Once the plan has been firmed up, the Ecuadorian Institute of Sanitation Works Management submits it to its authorities for approval and, in the end, it is forwarded to USAID for its final approval. It is rather worrisome that at the moment of evaluation the operating plan for 1993 has not yet been approved by the Ecuadorian Institute of Sanitation Works, although that plan had been presented through the management and project coordination in November 1992.

D. Project Decentralization

This project has been very successful through the work done by the so-called operating modules and, especially, when USAID resources are used. In this component, the project has been very successful in improving the efficiency and the costs connected with the construction projects of the Ecuadorian Institute of Sanitation Works. Unfortunately, the construction project was seriously affected by the lack of Ecuadorian Institute of Sanitation Works funds.

E. Supervision and Monitoring

By means of the monitoring workshops, it was possible to establish a group of performance indicators for the various components of the project; these indicators were successfully applied in the majority of provinces and served to evaluate the accomplishment of operating plans.

Supervision and technical support from technical assistance [personnel] on the provincial and community levels were affected by the lack of Ecuadorian Institute of Sanitation Works funds to pay for the travel expenses of the supervisory officials. As regards support for the group of domestic advisors going to the provinces, that support unfortunately was very limited and did not follow a well-organized program complete with objectives, goals, activities, and deadlines.

F. Recommendations

Here are the recommendations that remain yet to be carried out and that were drafted to strengthen the project's Administration and Management:

1. Promote establishment of a Project Steering Committee chaired by the Undersecretariat of Basic Sanitation in the Ministry of Urban Development and Housing and made up of the Directors of Finances, Human Resources, Basic Sanitation and Planning of the Ecuadorian Institute of Sanitation Works, the project managers from the Ecuadorian Institute of Sanitation Works and USAID, plus the Project Coordinator. This committee would have the following main functions: (a) approval and amendment of operating plans on the basis of evaluations done; (b) adoption, organization-wide, of the standards and procedures relating to decentralization, operations and maintenance, as well as the training and health education components; and (c) watch over correct implementation of the project, including timely transfer of financial resources to the provinces. It is proposed that this committee meet at least once a month and that it keep the participants informed on the Ecuadorian Institute of Sanitation Works restructuring process.

2. Boost the planning and monitoring process on the provincial level through quarterly meetings designed to evaluate the operating plans, said meetings to be attended by all officials involved in the project's implementation.

3. Have the Project Coordinator draw up a program of informative meetings with leading project officials, FASBASE, the World Bank, and the Public Health Ministry as well as the United Nations development program and with the person in charge of basic sanitation projects within the Inter-American Development Bank, so as to ascertain the progress of these projects and the political and technical positions of these institutions with relation to the potable water and sanitation subsector.

XI. PROJECT FINANCING THROUGH USAID AND THE ECUADORIAN INSTITUTE OF SANITATION WORKS: FINDINGS AND RECOMMENDATIONS

A. Allocated Financial Resources

Although this task was not within the scope of the work to be done by the evaluation group, it was very difficult for that group to gain access to accounting information that could offer the latest data on the use of the Ecuadorian Institute of Sanitation Works counterpart in the project. The Mission supplied the evaluators with the report evaluating the counterpart contributions--Agreement on Reimbursable Funds Between the Government of Ecuador and USAID--Project No. 518-0081 for the period of 22 September 1989 to 31 December 1991. This report was prepared by the firm of Romero Associates and states the following on page 20, fifth and sixth paragraphs: as indicated in Note 8 of the audit statement on contributions of the counterpart included on page 12, the minimum contribution would be US$104,000. Effective 31 December 1991--as established in the audit statement on contributions of the counterpart (page 6)--the Ecuadorian Government had contributed US$3,279,485 to the project.

In our opinion, the Ecuadorian Government--through the Ecuadorian Institute of Sanitation Works--did comply with all of the important aspects with the requirements established in the contractual clauses of the Agreement on Nonreimbursable Funds No. 518-0081 pertaining to the contribution amounts established in the financial plan.

The project monitoring report covering the period of 1991-1992 prepared by WASH states on page 5 that the budget funds required for the construction of systems or for the administration of field programs have fallen very short. When the project was dependent on Ecuadorian Institute of Sanitation Works funds for the purchase of supplies or the movement of personnel, the operating and maintenance activities and training and health education were very slow or did not exist at all. The above is certainly true and, in all of the provinces visited, officials complained of the lack of budget funds to take care of programs on the community level; this situation has been critical since August 1992 according to the information sources.

The above can be confirmed through information supplied by the Minister of Urban Development and Housing who, during a meeting with the evaluators in the presence of the MISSION Director, the Chief of the Health Division, and the Project Coordinator, announced that the Ecuadorian Institute of Sanitation Works had received only 14% of its allocated budget funds for 1992 from the Central Government.

B. Material Resources

This is another field where the USAID administration process has been slow and has generated delays in the accomplishment of project activities. For example, the pickup trucks and motorcycles for the provinces did not begin to be delivered until the end of 1992 and the audio-visual equipment is being delivered in January 1993.

The equipment to measure water quality is still being purchased and instruments currently used in the province of Carchi are merely on loan from the Pan-American Health Organization.

C. Human Resources

The allocation and use of this type of resource was clearly described in Section 10.3, Management and Administration of the Technical Assistance Project.

D. Recommendations

1. It is indispensable for the Ecuadorian Institute of Sanitation Works as quickly as possible to approve the project's operating plan for 1993.

2. Project Management and USAID must make sure that the Ecuadorian Institute of Sanitation Works does indeed transfer funds to the provinces for the operations and maintenance, training, and health education components.

3. The Ecuadorian Institute of Sanitation Works must set up the accounting process in such a manner that one can get up-to-date figures on counterpart funds. This type of information must be one of the parts of the Management Information System that the Ecuadorian Institute of Sanitation Works needs and that was recommended in Chapter 3, Industrial Development.

XII. LESSONS LEARNED

A. Introduction to the "Lessons Learned"

The following list of "lessons learned" goes beyond the conclusions and recommendations for this specific project. Rather, these "lessons learned" are a compendium of the project's contributions to the body of knowledge about water, sanitation, health, and the management and design of projects for this purpose. These lessons are meant to provide guidance for future projects both within Ecuador and elsewhere.

B. Lessons Related to Institutional and Administrative Matters

1. Much was learned during the years of implementation of this project, some encouraging, others rather average. The first of these is one that is commonly rather repetitive: CHANGE IS DIFFICULT. Institutional changes always drag out and are more complicated and difficult than conceived during the drafting of the projects. The creation of a sufficient body of knowledge, the improvement of management habits, and the switch toward fundamental attitudes on the part of the human resources--these have always been very complicated to implement and develop. The lack of constant supervision and follow-up are the main reasons as to why a project fails. The WASHED Project did everything possible to avoid these problems, but it did not have the economic counterpart resources from the Ecuadorian Institute of Sanitation Works in an opportune form.

2. The external and exogenous factors must always be kept in mind. For example, the change of a government administration almost always bring with it changes in policies, new priorities, and, on certain occasions, changes in the organizational structure and functions of the institutions. This is what happened as a result of the creation of the new Ministry of Urban Development and Housing and due to the relocation and restructuring of the Ecuadorian Institute of Sanitation Works, an entity that was strongly questioned by the government itself and by other foreign donors due to its lack of efficiency, its high bureaucracy on the central level, and the excessive cost of its activities.

3. For what remains of the project, AID should push to get the Ecuadorian Institute of Sanitation Works or the new entity or the existing entities-municipalities, Public Health Ministry, communities, etc. to assume responsibility for financing the components, especially the training, health education, and operations and maintenance components, and should avoid losing the gains that have been made.

4. The restructuring of the Ecuadorian Institute of Sanitation Works can have a positive or negative effect on the project's outcome; that is something that will have to be

checked. For example, valuable personnel trained through the project should be protected or should get a guaranteed position in the new structure of the Ecuadorian Institute of Sanitation Works.

5. Well-designed technical assistance is a factor that is particularly important in the project's success. Short-term and long-term advisors carefully chosen can have a positive impact on the projects and they can be the primary mechanisms for ensuring project implementation and for seeing to it that their counterparts learn skills, acquire knowledge, and develop appropriate attitudes so that the project financing entity will have a clear overview to make sure that the agreements and accords are complied with. This project has been exemplary in terms of the foreign technical assistance provided through WASH for institutional development and there was very good administrative action in coordinating this project. The national technical advisory body had its weak points in the operations and maintenance and health education components.

6. This information is very important since provincial-level personnel are conducting their community studies and are collecting information. Therefore, the existence of an information system that meets the needs of each component is a priority under the project and, in this sense, the project has been very weak and its actions have been very much improvised.

7. Systematic and coherent planning is difficult to organize and to set up on an institutional basis within the Ecuadorian Institute of Sanitation Works. There is no adequate mentality and there are no adequate strategic planning habits; as a result, the institution makes disparate efforts and there is a lack of coordination as to income and expenditures, programs and objectives, which, in turn, places the entire institution in a situation of considerable disjointedness; that, in turn, reduces its capacity to establish priorities, to develop policies, to create good programs, and to make more efficient use of its resources. The above are the worst weak points of the Ecuadorian Institute of Sanitation Works; they are its Achilles' heel and they must be tackled through its restructuring.

8. Decentralization is a worthwhile objective, but is difficult to achieve. In this project significant decentralization has taken place, with great benefits, but only in areas where the project specifically made an effort to push for it. For instance, as was called for in the project design, much more of the decisions related to system design and construction are now made at the provincial level, utilizing the groups of personnel referred to as "construction modules." However, the O&M, Appropriate Technology, Training, and Health Education components remain overly centralized.

C. Lessons Related to the Natural Environment

1. Deforestation has been noted as a problem affecting many of the water sheds (sub-cuencas) which feed the water sources for the rural water supply systems, and this in turn has led to reduced flows to these water supplies. However, the agency responsible for the water supplies, IEOS, does not see reforestation to be part of its role. Furthermore IEOS has made no effort to coordinate with the reforestation work of other agencies. A general lesson from this should be that if anything seriously jeopardizes either the quantity or the quality of a water supply, then the institution responsible for assuring this water supply should take relevant action, in coordination with other institutions which are responsible for the cause of the problem. A specific lesson is that deforestation cannot be ignored in any program with a goal of providing sustainable long-term water supplies.

D. Lessons Related to Community Management and Participation

1. Community water boards (JAAPs) have shown themselves to be responsible and capable organizations.

2. When water systems function poorly, the users resist paying their user-fees (tarifas), but when they function well, the vast majority of users pay their fees on time. This can turn into a vicious cycle, because a poorly functioning system may require funds to make the repairs which will correct the problems, but the users may resist paying until after the repairs have been made.

3. When communities are short on funds, one of the first things to be under-funded is chlorination of the water supply.

4. When a water system has an emergency which requires immediate funding, communities are often prepared to make special payments (cuotas extraordinarias) to pay for needed repairs.

5. Many rural communities have proven themselves to be capable of operating and maintaining fairly sophisticated water treatment plants, including such components as aeration, sedimentation, filtration, and chlorination. It is a very positive lesson that this is possible. However, in order to achieve this, the communities usually must employ a FULL-TIME operator, whereas only a part-time operator would be needed if the treatment plant were not part of the system.

6. Although communities in the coastal area (in El Oro Province) are more resistant to contributing unpaid labor for the construction of their water systems, they are prepared to pay adequate user-fees to cover operating costs, and (at least in the

communities observed by the evaluation team) they have well-organized and well-run water boards (JAAPs).

E. Lessons Related to Latrines

1. Pour-flush water-seal latrines (servicios higenicos con arrastre de agua manual) are very popular when there is an adequate supply of water. Big problems arise in this type of latrine when there is rationing in the system.

F. Lessons Related to Appropriate Technology

1. Some appropriate technologies have been developed and adopted locally in response to the needs that were felt and without any initiative on the part of a central authorities. Here are some examples of these developments: local production of sodium hypochlorite by a consortium of Community Water Boards in the province of Cotopaxi and by individual communities with advice from the Ecuadorian Institute of Sanitation Works in the province of Azuay. These local initiatives must be stimulated and their results must be shared with other groups working in the country.

SCOPE OF WORK

BACKGROUND:

USAID/Ecuador plans to carry out an evaluation of the Water and Sanitation for Health and Ecuadorian Development Project 518-0061 (WASHED), presently scheduled to end on 12-31-93. The purpose of the project is to strengthen the Ecuadorian Institute of Sanitary Works' (IEOS) capability to assist rural communities in eight provinces to: 1) install cost effective safe water supply systems and latrines; 2) use the water and latrines to improve family health; and 3) maintain and improve the systems in the future.

ARTICLE I - TITLE

Project: WASHED, Number: 518-0061

ARTICLE II - OBJECTIVE

A 3-person team for a period not to exceed 30 days each is required to review the progress of USAID assisted Water and Sanitation for Health and Ecuadorian Development (WASHED) Project No. 518-0061 and make recommendations for continuation of this project, or completion on schedule (12-31-93).

ARTICLE III - STATEMENT OF WORK -

A. Project Design. Determine the adequacy of project design for achieving desired goals, within originally scheduled project time-frame, including whether logframe assumptions were realistic; whether technical assistance design was appropriate; and whether project components have been appropriate.

B. Project Components. Evaluate specific project implementation elements, including hygiene education; operations and maintenance; appropriate technology; training and systems constructions. Each element should be evaluated in terms of whether project objectives are being met in a timely and effective manner. Identify specific internal and external constraints which have limited project success.

Project Management. Determine the adequacy and effectiveness of project management and administration on the part of the Instituto Ecuatoriano de Obras Sanitarias (IEOS), including coordination and management, monitoring, and supervision.

Special emphasis should be given to the newly appointed IEOS officials. Their clear understanding of the project's goal, purpose and component activities is crucial for the success of the project's remaining life and its potential extension, particularly in the context of the new institutional setting for IEOS within the Ministry of Housing and Urban Affairs. A detailed needs assessment should be determined and targeted to this new staff, which should at least include technical assistance and training.

D. Technical Assistance. Evaluate the effectiveness and timeliness of external technical assistance provided by the WASH Project; by the long term advisor; and by the local technical advisor team. This should include review of the scopes of work, reporting procedures, etc.

E. USAID Role. Examine the effectiveness of USAID monitoring and management, including identification of constraints.

F. Questions to be answered. USAID/E is interested in knowing what (if anything) should be done to further improve and/or strengthen the overall project, as well as consider its extension. Questions to address these concerns include the following:

1. Organization of IEOS. How sustainable are project activities? Specifically, have IEOS systems, structures and personnel patterns been established in order to assure continuity of activities after USAID financial support ends? If not, are such systems in the process of being established? Does institutional support for project activities include policy and financial comittment in order to assure continuity and sustainability?

2. Operation and Maintenance. How sustainable are the Community Water Boards?. Specifically, has the project strengthened IEOS' capability to provide assistance to the Community Water Boards? IEOS should be providing assistance in the areas of operation, maintenance and administration of systems, establishment and collection of adequate tariffs, bookeeping, water quality control, etc. Has the IEOS supervision program been effective in identifying community needs and problems on a timely basis?

3. Appropriate Technology. Has this component had a long term impact?. Specifically, has IEOS institutionalized the concept of continuous research of alternative technologies? Has the research led to specific new approaches to the cost effective delivery of potable water and sanitation services?

4. Hygiene Education. What has been the impact of using the promotor as a facilitator?. Specifically, how successful has the promotor program been in encouraging community awareness and responsibility for improving health behavior.? Has the

use of participative learning methodology based on adult education helped to develop an adequate hygiene education program? How useful are the socio-cultural field research activities? Have they had a significant impact in the design and implementation of hygiene education strategies?

5. Training. How effective is the new training system as proposed by the project? Specifically, has this system (based on adult education and participative learning) allowed the upgrading of technical and management skills and the introduction of innovative practices called for by the project? What has been the institutional comittment of IEOS towards the newly established training unit?

6. Systems Construction. How has the construction component evolved in the context of project opportunities and constraints? What are the major, if any, accomplishments of the component that could be attributed to the project? How could the component be strenghtened in the future?

7. What is the relationship of the project to USAID/Ecuador's Strategic Objective, which states "development of increased use, effectiveness, and sustainability of family planning and selected health services"?

8. Have project activities been coordinated with other USAID-funded projects with similar components, e.g. Cholera Response in Affected Rural Areas (Proj. No. 513-0108, implemented by CARE) and Child Survival and Health (No. 513-0071, implemented by MOH, MSH)?

G. Recommendations. Discuss specific recommendations in design and implementation of the project in order to assess and/or maximize its process and impact. Team should review the indicators that are currently being utilized by project and USAID, as evaluation recommendations will feed directly into USAID project monitoring and evaluation plan. Provide specific recommendations as to project status after PACD.

ARTICLE IV -REPORTS

A draft summary of the major findings must be completed in English and Spanish with main conclusions and recommendations, and reviewed with IEOS and USAID, and prior to the team's departure from Ecuador.

In the executive summary and report the following format will be used:

A Background,
B Purpose of Evaluation
C Methodology used
D Findings and Recommendations
E Lessons learned

A final report in English and Spanish must be completed and submitted to USAID/E no later than 30 calendar days after the team leaves the country.

ARTICLE V - RESPONSIBILITIES

Contractor is responsible for a two to three day team planning meeting, to be held in Quito, which will orient the evaluation team, clarify roles, clear questions, and establish a detailed workplan, including a timeframe. This responsibility includes all related arrangements, including but not limited to contracting an international Spanish speaking facilitator; all logistic arrangements; hiring of local secretarial assistance, etc.

ARTICLE VI - PERFORMANCE PERIOD

The evaluation should begin during the third week of January and last through the first two weeks of February, 1993.

ARTICLE VII - WORK DAYS ORDERED

Position	Work Days
Public Health, PHD	23
Public Health, MPH	23
Public Health Sanitary Eng.	23
Facilitator (if required)	4
	73

Note: It is estimated that the required work will require 54 person days plus the 6 person days for the TPM, plus 9 person days in the United States for report writing, plus 4 person days for the facilitator, for a total of 73 work days. However, the evaluation team should have the flexibility to stay in-country beyond the 54 person days as currently planned if this extension is seen as necessary. In any case, the total number of person days assigned to this task should not exceed 90 including travel days.

ARTICLE VIII - AID ILLUSTRATIVE BUDGET

See Attachment B.

ARTICLE IX - SPECIAL PROVISIONS

A. Duty Post: The duty post will be Quito. However, visits to different provinces considered in Project may be necessary.

B. Language Requirements: Spanish: Speaking 4, Reading 4.

C. Access to Classified Information: Contractor will not have access to any Government classified material.

D. Logistic Support: The team should come prepared to arrange and pay for all necessary logistical support, including typing and translating.

E. A six day work week is being authorized.

ANNEX B

EVALUATION TEAM WORK TIMETABLE

16-17 January:	Arrival in country
18-23 January:	Quito: meetings, interviews, and review of documentation
Sunday, 24:	Rest
Monday, 25 January - Tuesday, 2 February:	FIELD VISITS:
	The entire team went to the provinces of Cotopaxi, Tungurahua, and El Oro. A. Karp was in the province of Azuay, while R. Grueso and E. Gil went to Carchi.
3-13 February:	Preparation and presentation of report and last interviews
10 February:	Finish executive summary draft and present it (in the afternoon) to USAID and the Ecuadorian Institute of Sanitation Works in Spanish.
11 February:	Continue finishing the report draft.
12 February:	Verbal presentation to USAID and the Ecuadorian Institute of Sanitation Works.
13 February:	Review report on basis of comments made during verbal presentation and finalize annexes. Dr. Gil is to leave the country in the morning and Dr. Grueso will leave in the afternoon. After that date, Engineer Karp will no longer be working although he will remain in the country for another week for personal reasons.
	JSI will take responsibility for finishing the evaluation report and preparing the English-language version within 30 days.

ANNEX C

LIST OF OFFICIALS INTERVIEWED

1. USAID

- Robert Kramer, Mission Director, Ecuador, temporary.
- Ken Yamashita, Chief, Health and Population Division.

2. WASHED PROJECT

- Patricio Murgueytio, Manager, USAID.
- Adalid Arratia, Coordinator.
- Marcelo Piedra, National Advisor in Operations and Maintenance.
- Marcelo Córdoba, National Health Education Advisor.
- Jorge Echaverría, Training Advisor.
- Jaime Nuñez, Advisor in Appropriate Technology.

3. ILEOS

PROVINCIAL LEVEL

- Wladimir Roura, Secretary of Environmental Recovery.
- Gina Vitevi, National Director of Basic Sanitation.
- Diego González, Ecuadorian Institute of Sanitation Works Project Manager.
- Ramiro Andrade, Financial Director.
- Augusto Merchán, Planning Director, temporary.
- Jorge Muñoz, Human Resources Director.
- Magno Pérez, Chief, Health Education Component.
- Néstor Orquera, Chief, Training Component.
- José Pilamonga, Chief, Appropriate Technology Component.

- Sigifredo Ruales, Chief, National Construction Component.]

- Franco Narváez, Chief, National Operations and Maintenance Component.

Province of Cotopaxi

- Carlos Pazmiño, Provincial Chief.

- Neftalí Angulo, Chief, Construction Component.

- Raquel Coque, Chief, Health Education Component.

- Héctor Reinoso, Chief, Appropriate Technology Component.

- Fernando Quimbita, Chief, Training Component.

- Gualberto Górnez, Health Promoter for Operations and Maintenance.

- Washington Salgado, Operations and Maintenance Promoter.

- Francisco Vallejo, Operations and Maintenance Promoter.

Province of Tungurahua

- Antonio Camino, Provincial Chief.

- Marcos Salazar, 2nd Representative.

- Oscar Vásquez, Chief, Construction Component.

- William Welastequi, Chief, Appropriate Technology Component.

- Nelson Baragán, Chief, Construction Component.

- Carlos Coroma, Operations and Maintenance Promoter.

- Rodrigo Vargas, Operations and Maintenance Promoter

Province of El Carchi

- Olmedo Vásquez, Provincial Chief, temporary.

- Wilson Rueda, Chief, Construction Component.

- Galo Belalcázar, Chief, Training Component.

- Wilmer Villareal, Chief, Operations and Maintenance Component.

Province of El Oro

- Francisco Vera, Provincial Chief.

- Luis Freire, Chief, Operations and Maintenance Component.

- Bolívar Jaramillo, Chief, Training and Health Education Component.

- Patricio Ochoa, 2nd Representative.

- Fredy Aguirre, Chief, Construction Component.

- Jorge Cordero, Training Official

- Jorge Peñaloza, Chief of Construction.

Province of Azuay

- Patricio Fernández, Provincial Chief.

- Remigio Martínez, Chief, Department of Basic Rural Sanitation.

- Juan Rojas, Construction Promoter.

- Carlos Torres, Operations and Maintenance Promoter.

- Marcelo Alvarado, Chief, Training Component.

- Catalina Maldonado, Chief, Health Education Component.

- Gloria Patiño, Health Promoter.

- Inés Peralta, Health Promoter.

- Eulalia Quesada, Administrative Assistant of Training Component.

4. MINISTRY OF URBAN DEVELOPMENT AND HOUSING

- Francisco Albornoz, Minister.

5. MINISTRY OF PUBLIC HEALTH

- Patricio Abai Herrera, Undersecretary of Public Health.

- Raúl Maldonado, Coordinator of International Relations.

- Fernando Zacoto, FASBASE Project Coordinator. World Bank. United Nations Development Program

- Jorge Mayorga, Sanitation Advisor. FASBASE Project. World Bank.

6. UNITED NATIONS DEVELOPMENT PROGRAM

- Diego Palacios, FASBASE Project Coordinator.

7. INTER-AMERICAN DEVELOPMENT BANK

- Patricio Naveas, Specialist in Sanitation.

8. WASH PROJECT

- Daniel Edwards, International Management Development Consultant.

- Oscar Larea, International Consultant for Operations and Maintenance Component.

- Mercedes Torres, Management Development Training Facilitator.

9. CHILD SURVIVAL PROJECT. USAID-ECUADOR

- Roy Brooks, MSH Group Chief.

- Lupe Orozco, MSH Statistician.

10. COMMUNITY PERSONNEL

- Seven (7) Health Promoters.

- Four (4) Rural Teachers.

- Three (3) School Principals.

- One (1) Provincial Public Education Supervisor.

- Two (2) Nursery Directors.

- Thirty (30) Families on Housing Unit Level.

- Four (4) Trained Community Leaders.

11. OTHERS

- Steven Maber, World Bank.

- Chris Roesel, CARE/ECUADOR.

- Fabián Yáñez, Sanitary Engineer/Consultant and Former Executive Director of ILEOS.

ANNEX D

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ANEXO E

LISTA DE COMUNIDADES VISITADAS

COMUNIDADES	PROVINCIA	TIPO DE SISTEMA	ANO DE INAGURACION	CALIDAD AGUA	CLORACION	OTRO TRATAMIENTO
1.TINGO GRANDE Y CHICO	COTOPAXI	Gr.,Vert	1988	BUENO	SI	NO
2.SAN FRANCISCO CHASQUI	COTOPAXI	Gr.,G.I.	1986	BUENO	SI	NO
3.CHAMBAPONGO	COTOPAXI	Gr.,Canal	1983	BUENO	SI	VARIOS
4.CHILGO	TUNGURAHUA	Gr.,Vert	1979	BUENO	SI	NO
5.LLIMPE CHICO Y GRANDE	TUNGURAHUA	Gr.,Vert	1990	BUENO	SI	VARIOS
6.TUGULA - LUNDAMA	AZUAY	Gr.,Canal	1989	BUENO	SI	FILTRACION
7.CATAVINA	AZUAY	Gr.,Vert	1990	BUENO	SI	NO
8.GUAMAG	CARCHI	Gr.,C.R.	1990	+/-	+/-	NO
9.LAS LAJAS	CARCHI	Gr.,Vert	1991	BUENO	SI	VARIOS
10.TORATA	EL ORO	Gr.,Quebr	1989	BUENO	SI	VARIOS
11.EL RETIRO	EL ORO	Bombeo,poz	1986	BUENO	SI	NO

COMUNIDADES	NO.FAMILIAS	TIEMPO REQUERIDO PARA IR A LA FUENTE ANTERIOR IDA Y VUELTA	CANTIDAD DE AGUA	COMENTARIOS GENERALES
1.TINGO GRANDE Y CHICO	80	2.0 HORAS	BUENO	MUY BUENO
2.SAN FRANCISCO CHASQUI	163	1.0 HORA	MALO	RACIONAN EL AGUA, 6 HORAS/DIA
3.CHAMBAPONGO	139 *	POCOS MINUTOS	BUENO	TRATAMIENTO SOFISTICADO
4.CHILGO	143	1.0 HORA	MALO	RACIONAN EL AGUA
5.LLIMPE CHICO Y GRANDE	280	POCOS MINUTOS	BUENO	TRAT.SOFIS.,ALTA AGUA VERANO
6.TUGULA - LUNDAMA	75	POCOS MINUTOS	BUENO	TRATAMIENTO SOFISTICADO
7.CATAVINA	33	1.0 HORA	BUENO	A ALGUNOS,MAS ALTOS,FALTA AGUA
8.GUAMAG	59	0.3 HORA	BUENO	CLORAN CADA TRES DIAS
9.LAS LAJAS	57	0.5 HORA	BUENO	MUY BUENO
10.TORATA	145	POCOS MINUTOS	BUENO	MUY BUENO
11.EL RETIRO	250	1.0 HORA	BUENO	PUESTO DE CLORO MAL UBICADO
				SUBSIDIO POR MUNICIPALIDAD

* ES UN SISTEMA REGIONAL. 139 FAMILIAS EN UNA COMUNIDAD Y 180 EN OTRA.

COMUNIDAD	TARIFA BASICA (SUCRES)	LA TARIFA ES ADECUADA	COMENTARIOS	EL OPERADOR			
				CALIDAD O&M	PARECE CAPAZ	PAGO MES	TRABAJA DIAS/MES
1.TINGO GRANDE Y CHICO	200	NO	PAGAN CUOTAS EXTRAORDINARIAS	BUENO	SI	10000	8
2.SAN FRANCISCO CHASQUI	200	NO	PIENSAN AUMENTARLA	BUENO	SI	15000	30
3.CHAMBAPONGO	200	NO	NO ALCANZA PARA COMPRAR CLORO	BUENO	SI	13500	30
4.CHILGO	100	NO	QUEJAS POR FALTA DE AGUA	BUENO	SI	6000	4
5.LLIMPE CHICO Y GRANDE	200	NO	NO ALCANZA PARA COMPRAR CLORO	BUENO	SI	30000	30
6.TUGULA - LUNDAMA	1100	+/-	PAGAN CUOTAS EXTRAORDINARIAS	BUENO	SI	80000	30
7.CATAVINA	500	NO	DICEN QUE ES MUY BAJA	BUENO	SI	15000	30
8.GUAMAG	400	NO		MALA	SI	10000	3
9.LAS LAJAS	200	SI		BUENO	SI	7000	5
10.TORATA	1000	SI		BUENO	SI	100000	30
11.EL RETIRO	500	NO	LA MUNICIPALIDAD PAGA SUELDO DEL OPERADOR Y ENERGIA ELEC.	BUENO	SI	200000	30

ANEXO F

GUIA DE ENTREVISTA PARA COORDINADOR PROVINCIAL
DE CAPACITACION Y EDUCACION SANITARIA

1. Desde cuando trabaja en este cargo? es estable?
2. Cual es su formacion y que capacitacion ha recibido, en que areas, por parte de quien?
3. Cuales son sus responsabilidades?
4. Le ha servido la capacitacion para el desempeno de sus funciones, que areas mas y que areas menos?
5. Que problemas encuentra para el desempeno de sus funciones, que se debe hacer para mejorar?
6. Que problema encuentra para el cumplimiento de sus metas, que debe hacerse para mejorar?
7. Quien o quienes realizan la planificacion, cada cuanto y cual es la informacion base para la planificacion de su componente?
8. Cual es el objetivo de su componente en la Provincia?
9. Cuales son los objetivos para 1993?
10. Cuales son las actividades que realizo en 1991 y 1992?
11. Cuales son las actividades programadas para 1993? tiene plan operativo?
12. Cual es la metodologia que utiliza para realizar las actividades programadas? es propia o de nivel central?
13. El contenido de sus actividades son propias o de nivel central?
    Cual es el espacio-poblacion meta del componente, y cual sera para 1993?
15. Que recursos humanos, materiales y financieros poseen? quien aporta lo necesario? con que agilidad?
16. Como y que monitorea y evalua de su trabajo y si su componente ha cumplido con lo programado?
17. Con que perioricidad se reune con el equipo provincial, para que, y cual es la metodologia?
18. Quien, que, cuando y como lo supervisan a usted y usted a sus subalternos?
19. Cual es el sistema de informacion de su componente, a quien informa, perioricidad, oportunidad y retroalimentacion?
20. Que espera del nivel central para 1993.
21. Que opinion tiene sobre la asesoria internacional, calidad, oportunidad, contenidos.

EDUCACION SANITARIA

22. Tiene un Plan de Comunicacion?
23. Tiene material educativo de apoyo? cual? quien lo elaboro?, se tomo en cuenta los resultados de la encuesta socio-economica realizada, fue validado con la comunidad?
24. Que entiende por Participacion Comunitaria?
25. Cuales son las actividades que realiza la comunidad en trabajo comunitario y en educacion sanitaria?
26. Cual es la participacion de la mujer de la comunidad en aspectos de desarrollo comunitario, educacion sanitaria y en agua y saneamiento?

ANEXO F

GUIA DE ENTREVISTA PARA USUARIOS O BENEFICIARIOS

1. Sabe usted cual es el trabajo que realiza IEOS en la comunidad, ha recibido usted o su familia algun beneficio, cual?
2. Les pidieron a ustedes su opinion para realizar el proyecto, estaban de acuerdo, si es no, porque?
3. De que manera participo o colaboro usted o su familia para el desarrollo del proyecto?
4. Conoce usted cual es el trabajo que realiza el promotor(a) de IEOS en la comunidad, ha tenido contacto usted con el(ella), que tipo y frecuencia de comunicacion o contacto ha tenido usted con el promotor(a)?
5. Que apoyo o ayuda ha recibido usted del promotor(a) de IEOS, como lo considera, quisiera que continuara igual o prefiere otro tipo de apoyo, cual?
6. Lo que usted sabe sobre salud, agua y saneamiento, donde lo aprendio, por que medios, que opina de esta manera de aprender?
7. Aplica usted en su vida diaria lo que aprendio, porque, en que?
8. Ha recibido charlas, visitas en su casa por parte del pormotor(a), materiales educativos, que materiales, lo puede mostrar, sobre que hablo el promotor(a) o los materiales educativos?
9. De que manera participa usted en el trabajo que realiza el promotor(a), le gusta, que opina?
10. Tiene letrina en su casa, si no tiene, porque no la ha construido. Si tiene, que lo motivo a construirla, por medio de quien la construyo, que tuvo que poner de su parte, esta satisfecho con el trabajo.
11. Que le gusta y que no le gusta de la letrina que construyo?
12. Usan los ninos la letrina, como hacen para hacer sus necesidades, si no la usan, porque y como?
13. Que cuidados tiene con los ninos despues de hacer sus necesidades y antes de comer?
14. Que debe hacer con los papeles usados y como cuidar la letrina?
15. De donde obtiene el agua para el uso de la casa, que problemas tiene en tomar agua de ese sitio, como es el agua que recibe, es limpia, buen sabor, abundante, permanente?
16. Donde almacena el agua para beber y que cuidados tiene con ella? porque?
17. A quien pertenece el sistema de agua, a quien se le paga las cuotas, como considera las cuotas, que opina de estar pagando? si no paga cree que deberia de pagar las cuotas?
18. Que beneficios ha tenido ahora con el agua? como considera que seria mejor?
19. Porque cree que da diarrea, como se tratra, como se previene?

21. Que hace usted con la basura, animales domesticos, que debe hacer? porque?

20. Existen grupos organizados en la comunidad que se preocupen por la salud y bienestar de la comunidad? quienes son? quien los organizo?
21. En que participa la mujer para solucionar problemas de la comunidad?
22. Que participacion tiene la mujer en las organizaciones existentes, que puestos ocupa, si es no, porque no participa?

ANEXO F

GUIA DE ENTREVISTAS PARA LIDERES COMUNITARIOS

1. Sabe cual es el trabajo que realiza IEOS en la comunidad, que opinion tiene, que mas quisiera?
2. Cual es su relacion con el promotor(a) de IEOS, trabajan juntos, en que participa usted, que opina del trabajo que realiza el promotor(a)?
3. Que papel juega usted dentro de la comunidad? quien lo busco para que desarrollara esa actividad? le gusta hacerlo? que problemas tiene para desempenarse?
4. Se consulto a la comunidad sobre el proyecto de IEOS, que medios de consulta se utilizaron, con que interes y como participo la comunidad en la planificacion del proyecto?
5. Como participo la comunidad en la ejecucion del proyecto, el proyecto se desarrollo como la comunidad esperaba?
6. Ha recibido cursos de capacitacion, quien se la dio, sobre que temas, cuantas veces? como aplica usted esa capacitacion?
7. Lo que usted sabe sobre salud, agua y saneamiento donde lo aprendio?
8. Que sabe usted sobre la diarrea, causas, tratamiento y prevencion?
9. Que cuidados debe tener con el agua y porque? porque es importante la letrina y como debe usarse y cuidarse?
10. Que cuidados debe tenerse con los animales domesticos y las basuras. Porque?
11. Ha recibido usted materiales educativos, sobre que habla, que opinion tiene de este material? como los utiliza usted?

ANEXO F

GUIA DE ENTREVISTA PARA JEFES Y ASESORES DE COMPONENTE DE CAPACITACION Y EDUCACION SANITARIA A NIVEL CENTRAL

1. Historia y antecedentes del Componente
2. Formacion profesional y experiencias de los Jefes y Asesores de los componentes.
3. Planificacion
   - informacion base
   - participantes
   - perioricidad
   - contenidos
4. Objetivos
   - del proyecto
   - del componente
5. Actividades
   - identificacion
   - estrategias
   - metodologia
     * central
     * provincial
     * comunidad
6. Recursos
   - humanos, estructura, funciones
   - materiales
   - finacieros
7. Monitoria
   - perioricidad
   - metas
   - indicadores
8. Evaluacion: uso, eficiencia, sostenibilidad.
   - estructura
   - proceso
   - impacto
9. Supervision
   - lineamientos
   - programacion
   - cumplimiento
   - directa
   - indirecta
10. Sistema de Informacion
    - responsabildad
    - perioricidad
    - canalizacion
    - oportunidad
    - contenidos
    - retro-alimentacion
11. Logros obtenidos y dificultades enfrentadas
12. Educacion Sanitaria
    - Plan de Comunicacion
    - Materiales Educativos/medios masivos.

ANEXO F

GUIA DE ENTREVISTA PARA MAESTROS RURALES

1. Que sabe usted del trabajo del IEOS en la comunidad? que opinion tiene?
2. Cual es la relacion que tiene usted (escuela) con el trabajo del IEOS? que problemas hay, como se puede mejorar?
3. Ha recibido capacitacion por parte del IEOS, en que areas, que opina de la capacitacion, como se podria mejorar?
4. Ha sido util en su trabajo esa capacitacion, como la aplica?
5. Ha recibido material de apoyo, en que consiste, que opina del material, como se puede mejorar?
6. Tiene problema para incluir el tema dentro del curriculum y su plan de trabajo, cada cuanto da el tema, lo evalua como el resto de los temas oficiales?
7. Cree que se ha logrado que los ninos aprendan y cambien sus habitos? como lo sabe?
8. Hay alguna actividad de evaluacion y seguimiento del modulo por parte del IEOS?
9. Que impacto tendra este modulo en las condiciones de vida y salud de la comunidad?
10. Que sugerencias tiene usted para mejorar este modulo?

ANEXO F

GUIA DE ENTREVISTA PARA PROMOTOR DE SALUD

1. Desde cuando trabaja de promotor(a)?
2. Que capacitacion ha recibido, en que areas, quien se la dio?
3. Cuantas comunidades tiene bajo su responsabilidad, cada cuanto las visita, como se desplaza?
4. Como, cuando y con quien planifica su trabajo, cual es la informacion base para la planificacion?
5. Cual es el trabajo que realiza en la comunidad, que problemas tiene para desarrollarlo, para cumplir sus metas?
6. Que material educativo y de promocion utiliza en su trabajo con la comunidad?
7. Se utilizo los resultados de la encuesta socio-cultural para el diseno de esos materiales?
8. Que entiende por Participacion Comunitaria? como participa la mujer?
9. Como recibe la comunidad su trabajo, como y en que participa la comunidad en el desarrollo de sus actividades?
10. Que metodologia utiliza para realizar las actividades de educacion sanitaria y participacion comunitaria?
11. Cuales son los temas de educacion sanitaria que da en la comunidad? esta de acorde a la problematica de la comunidad o es el mismo que se da en todas las comunidades?
12. Como monitorea y evalua su trabajo? quien, cuando, como?
13. Cada cuando tienen reuniones con el equipo provincial, que temas tratan, que metodologia usan?
14. Quien, como, cuando y que le supervisan?
15. Cual es el sistema de informacion que utiliza, a quien le informa, perioricidad, oportunidad, retroalimentacion?
16. De las areas de capacitacion que usted recibio, cual pone en practica en su trabajo, cual no y porque?
17. Que apoyo recibe del nivel provincial, central, y que mas esperaria?
18. Que opinion tiene sobre la asesoria internacional y local?
19. Como considera su capacidad para desarrollar las actividades de recoleccion de informacion cualitativa (entrevistas,grupos focales) en las comunidades.
20. Cual fue su participacion en la recoleccion de la encuesta socio-cultural, cual fue la metodologia que utilizaron?
21. Que poblacion se entrevisto durante la encuesta socio-cultural?
22. Se han tenido en cuenta los resultados de la encuesta socio-cultural para el trabajo educativo de comunidad?
23. Como colaboran los maestros en su trabajo?
24. Como coordina sus actividades con otras instituciones?

ANEXO F

GUIA DE OBSERVACION **A NIVEL DE LA VIVIENDA**

1. Condiciones de higiene general de la vivienda
2. Presencia o no de coneccion domiciliaria de agua potable?
3. Manejo de aguas servidas?
4. Acarreo, almacenamiento y manipulacion de agua de consumo?
5. Presencia de letrina, ubicacion, calidad de materiales, tipo de letrina, aspectos de construccion, uso y mantenimiento, disposicion de papeles o materiales de limpieza, material fecal en el patio?
6. Presencia, disposicion y manejo de basuras o desechos solidos?
7. Presencia y manejo de animales domesticos?
8. Aspectos generales de higiene personal de los miembros de la familia?

ANEXO F

CUESTINARIOS PARA ENTREVISTAS.

Cuestionario para Directores Provinciales y Segundos Representantes y Supervisores de las Provincias. Componente Desarrollo Gerencial.

Fecha_____
Entrevistador_____
Provincia_____
Cargo del Informante_____
_____

A. Grado de conocimiento de los objetivos y componentes del Proyecto.

* Sabe usted cuando se inicio este proyecto y cuando es la fecha de terminacion del mismo?

* Cuales son los objetivos del proyecto?

* Cuales son los componentes del Proyecto?

* Esta usted de acuerdo con los componentes del Proyecto? desearia suprimir o agregar alguno-Cual?

B. Proceso de Planificacion y Monitoreo del Proyecto.

* Existe un plan operativo del proyecto para 1.993?

* Quienes participaron en la formulacion del plan ?

* Existe un plan de monitoreo del Plan ?

* Quienes realizan el monitoreo del plan ?

* Existen indicadores de desempeño que se aplican durante el monitoreo?

* Cada cuanto se evalua el plan y quienes participan en la evaluacion?

* Cual es el apoyo que usted recibe del nivel central en este proceso?

Cual es el apoyo que usted recibe de la asistencia tecnica en este proceso?

C.Coordinacion e informacion del proyecto.

* Existe un Comite u otro mecanismo de coordinacion general y especifica de los componentes del proyecto ? Cual o Cuales?

* Quienes lo integran ? Cada cuanto se reunen?

* Cuales son sus principales funciones o actividades?

* Existen otras instituciones que participan en el suministro de agua potable y letrinas a nivel rural ? Cuales?

* Que mecanismo de coordinacion existe para asegurar la complementacion de estos esfuerzos? Cual es su funcion? Con que frecuencia se implementa este mecanismo?

* Esta instalado el sistema computarizado de informacion en su provincia? En que consiste? Para que se usa?

* Hasta donde se ha logrado un integracion de los componentes del proyecto ?

* Si faltan mecanismos apropiados para la coordinacion e informacion del proyecto que se podria hacer para mejorar esta situacion?

D. Administracion del Proyecto

* Es oportuna la asignacion y giro de los fondos por parte del IEOS para financiar las actividades del proyecto ? Comentarios.

* USAID ha reembolsado oportunamente los fondos ?

* Su provincia ha presentado oportunamente los justificativos de gastos?

* El equipo trabajo provincial ha sido capacitado para el manejo de los fondos del proyecto?

* Estan definidas las normas legales para la administracion del proyecto a nivel provincial? Son mecanismos especiales y de

caracter temporal mientras dure el apoyo de USAID ?

E. Descentralizacion del IEOS.

* Se ha logrado el compromiso del nivel central para apoyar el proceso de descentralizacion incluido en el proyecto ? Comentarios.

* Cuantos - modulos operativos - estan operando en su provincia? Cuales son sus principales realizaciones?

* Existe un grupo de apoyo para fortalecer el proceso de descentralizacion? Quienes lo integran ? Cuales son sus principales resultados?

Si el proceso de descentralizacion es muy deficiente, cuales son sus recomendaciones para hacerlo una realidad?

F. Supervision y asistencia tecnica.

* Cada cuanto recibe usted supervision del nivel central para proyecto ? Quien la realiza? Como califica usted dicha supervision? Le ayuda a solucionar problemas ? Comentarios.

* Como considera usted la calidad, suficiencia y oportunidad de la asistencia tecnica provista por el equipo de asesores nacionales e internacionales? Comentarios.

G. Capacitacion para el Desarrollo Gerencial.

* Participo usted en los talleres de desarrollo gerencial? En todas las fases? En cuales no participo ?

* Participo usted en los talleres de monitoreo del proyecto?

H. Continuidad de los esfuerzos del proyecto.

* Como ve las perspectivas de permanencia del esfuerzo hecho a traves del proyecto una vez que terminara el apoyo de USAID? (explique).

* Que se podria hacer para asegurar la continuidad de dichos esfuerzos por parte del IEOS?

* Quienes serian los responsables?

ANEXO F

CUESTIONARIO PARA ENTREVISTAS.

Cuestionario para entrevistas con los miembros de la Juntas Administradoras de agua potable para el area rural. Componente Desarrollo Gerencial.

Fecha_____
Entrevistador_____
Provincia_____
Comunidad_____
Numero de Usuarios_____
Miembro de la Junta_____

Sexo del Informante: M F

1. Constitucion de la Junta.

* Cuando se creo la Junta?

* Cuando se hizo la ultima eleccion de la Junta?

* Cuantos miembros integran la Junta?

* Cuanto hace que usted es miembro de la Junta?

* Como fueron elegidos los miembros de la Junta?

* Existe mujeres en la Junta? SI NO Considera importante la comunidad que la mujer participe en el Junta? SI NO (explique).

2. Funciones de la Junta.

* Cuales son las principales funciones de la Junta?
1_____
2_____
3._____
4_____

3. Funcionamiento de la Junta.

* Cada cuanto se reune la Junta?

* Cuantas veces se reunio durante 1.992?

* Tiene actualizados los libros de actas y balances de ingresos y gastos mensuales ? SI NO Comentarios.

* Cuando se fijaron las tarifas vigentes?

4. Funcionamiento de la Asamblea de Usuarios.

* Cuando fue la fecha de la ultima reunion de la Asamblea de Usuarios?

* Cuantas veces se reunio la asamblea durante 1.992?

4. Desarrollo Gerencial de la Junta.

* Ha recibido usted capacitacion para administrar el acueducto?

* Cuando y en que consistio dicha capacitacion? Fecha-Contenido-Duracion-Responsable.

* Es adecuada la capacitacion recibida?

* Quienes otros miembros de la Junta han sido capacitados?

5. Supervision y apoyo por parte del IEOS.

* Cada cuanto recibe supervision del IEOS?

* Cuando fue la ultima visita hecha por un miembro del IEOS y para que?

* Esta satisfecho con el apoyo del IEOS? SI NO (explique)

Capacidad financiera del sistema.

* Con las tarifas cobradas es posible mantener y operar el sistema? SI NO (explique).

* Que porcentaje de usuarios del sistema estan al dia en el pago de sus tarifas?

* Si las tarifas no alcanzan para operar y mantener el sistema que piensa hacer la Junta y la Comunidad?

OPERACION Y MANTENIMIENTO, TECNOLOGIA APROPIADA, Y CONSTRUCCION: CUESTIONARIO Y OBSERVACIONES A NIVEL DE LA COMUNIDAD

Fecha_____
Entrevistador_____
Comunidad_____
Provincia_____
Persona(s) entrevistada(s):
_____
Puestos de los entrevistada(s):
Presidente de la JAAP?:_____ Sexo:____
Miembro de la JAAP?:_____ Sexo:____
Operador?:_____ Sexo:____
Otro(s)?:_____ Sexo:____
Otro(s)?:_____ Sexo:____

SITUACION GENERAL DEL SISTEMA DE AGUA POTABLE:

1. Cual es la situacion general:

   A. EL SISTEMA FUE CONSTRUIDO HACE TIEMPO, Y POSIBLEMENTE REQUIERE REHABILITACION:.. Si:___ No:___

   B. EL SISTEMA ES RECIEN CONSTRUIDO:..... Si:___ No:___

   C. EL SISTEMA SE ESTA EN CONSTRUYENDO:..... Si:___ No:___

   D. NO HAY SISTEMA, PERO ESTA PROGRAMADO:.... Si:___ No:___

2. Cuando se termino la construccion del sistema de agua potable?

3. Que tipo de sistema de agua potable se tiene (o estan construyendo)?

   A. Por gravedad?____
      La fuente de agua es:
      una vertiente?___
      un riachuelo?____
      un rio?_____
      un lago?_____
      otro?_____ Cual?_____

      Cual es la distancia entre la fuente de agua y el tanque de almacenamiento (aproximadamente)?_____

   B. Por bombeo motorizado?____
      electrico?_____
      motor de diesel?____
      molino de viento?___
      energia solar?_____

      Cual es la profundidad total del pozo (aproximadamente)?_____
      Cual es la profundidad hasta la superficie del agua en el pozo?_____

C. Por bombeo manual?___
Cual es el modelo de bomba manual?

Cual es la profundidad total promedio de los pozos (aproximadamente)?_____
Que es la profundidad promedio hasta la superficie del agua en los pozos? _____

4. Hay un sistema de tratamiento del agua?..... Si:___ No:___
Incluye un aereador?..... Si:___ No:___
Incluye un desarenador?..... Si:___ No:___
Incluye un sedimentador?..... Si:___ No:___
Incluye un prefiltro?..... Si:___ No:___
Incluye filtracion dynamica por arena.. Si:___ No:___
Incluye filtracion lenta por arena?... Si:___ No:___
Incluye clorinacion?..... Si:___ No:___

USO Y FUNCIONAMIENTO DEL SISTEMA DE AGUA POTABLE:

5. Cuantos usuarios (familias) participan en el proyecto?

Hay medidores en todas las casas? Si:___ No:___

Comentarios:

6. Cuantos familias no son usuarios (no participan)?

Porque no participan dichas familias?

7. La toma de agua (la fuente) da suficiente agua durante todo el ano?
Si:___ No:___

Si no da todo el ano, durante cuantos meses no hay suficiente agua?

8. Con que frecuencia hay fallas?

Que tipo de fallas han tenido?

9. El agua llega, durante todo el dia, a las casas de todos los usuarios?
Si:___ No:___

Si no llega a todos los usuarios, entonces cuantos de ellos no reciben agua por lo menos parte del dia?

Durante cuantas horas promedio por dia llega el agua a las casas de estos usuarios?

10. La comunidad esta contenta con el sistema de agua potable?
Si:___ No:___ Mas o menos:___

Porque?

11. En donde consequia la gente el agua antes de la construccion del sistema?

    Cuanto tiempo tardaba ir (ida y vuelta) para llegar a la fuente anterio? _____horas _____minutos.

    Cual era la calidad del agua de la fuente anterio?:

12. Cuanto es la tarifa mensual para agua potable? _____Sucres

13. Todos los usuarios pagan sus tarifas? Si:___ No:___

    Si algunos no pagan, cuantos familias no pagan? _____

    Por que no pagan?

TRATAMIENTO Y CALIDAD DEL AGUA:

14. La gente de la comunidad esta satisfecha con la calidad del agua:
    Si:___ No:___ Mas o menos:___

    Comentarios y observaciones:

15. El sistema de clorinacion esta funcionando: Si:___ No:___

    Comentarios y observaciones:

OTROS USOS DEL SISTEMA DE AGUA POTABLE:

16. Se permite el uso del sistema de agua potable para regar huertos familiares o terrenos? Si:___ No:___

    Cuantos usuarios (familias), mas o menos, estan utilizando el sistema de agua potable para regar sus terrenos?

    Comentarios y observaciones:

17. Se permite el uso del sistema de agua potable para otros usos que no son del uso domestico? Si:___ No:___

    Cuales son esos usos?

    Comentarios y observaciones:

O Y M, TECNOLOGIA APROPIADA, Y CONSTRUCCION:
CUESTIONARIO Y OBSERVACIONES A NIVEL DE LA COMUNIDAD
COMUNIDAD:_____

OPERACION Y MANTENIMIENTO DEL SISTEMA DE AGUA POTABLE:

18. La O y M del sistema ha sido adecuada?
Si:___ No:___ Mas o menos:___

Comentarios y observaciones:

19. La tarifas han sido adecuadas para cubrir los gastos de O y M?
Si:___ No:___ Mas o menos:___

Comentarios y observaciones:

EL OPERADOR (EL AGUADERO):

20. Hace cuanto tiempo que trabaja el operador actual? _____

Cuantos operadores hay?_____ Cuantos fueron capacitados?_____

El operador actual es el operador original? Si:___ No:___

Comentarios sobre la frecuencia de cambios del operador:

21. El operador se siente y parece suficientemente capaz para realizar toda la O Y M normal? Si:___ No:___ Mas o menos:___

Que tipo de capacitacion ha recibido el operador:

Comentarios y observaciones:

22. El operador cuenta con las herramientas y materiales necesarios para realizar toda la O y M normales?
Si:___ No:___ Mas o menos:___

Comentarios y observaciones:

23. El operador trabaja un promedio de cuantos dias por mes:_____ dias

Es este tiempo adecuado?
Si:___ No:___ Mas o menos:___

Recibe algun apoyo por IEOS o por otros? Si:___ No:___

Comentarios y observaciones:

24. El operador recibe un sueldo o bonificacion? Si:___ No:___
Cuanto recibe?: _____Sucres por mes.
Esta contento con este sueldo:
Si:___ No:___ Mas o menos:___

Cuando fue el ultimo aumento?_____

REHABILITACION DEL SISTEMA DE AGUA POTABLE:

25. El sistema ha tenido algun tipo de rehabilitacion?
Si:___ No:___

Quien pago esta rehabilitacion?

Quien realizo esta rehabilitacion?

Comentarios y observaciones:

26. El sistema actualmente requiere algun tipo de rehabilitacion?
Si:___ No:___

Comentarios y observaciones:

TECNOLOGIA APROPIADA DEL SISTEMA DE AGUA POTABLE:

27. La tecnologia utilizada ha sido apropiada?
Si:___ No:___ Mas o menos:___

Comentarios y observaciones:

28. La tecnologia utilizada incluyo alguna novedad, como por ejemplo el uso de una tecnologia apropiada experimental o demostrativa? Si:___ No:___

Comentarios y observaciones:

O Y M, TECNOLOGIA APROPIADA, Y CONSTRUCCION:
CUESTIONARIO Y OBSERVACIONES A NIVEL DE LA COMUNIDAD

COMUNIDAD:_____

DISENO Y CONSTRUCCION DEL SISTEMA DE AGUA POTABLE:

29. Cuantos jornales (mingas) de trabajo hizo cada familia para construir el sistema de agua potable?

30. El diseno del sistema es adecuado?: Si:___ No:___

Comentarios y observaciones:

31. La construccion del sistema es adecuada?: Si:___ No:___

Comentarios y observaciones:

LETRINAS:

32. Cuantos usuarios (familias) han construido letrinas?

33. Si algunos no han construido letrinas, por que?

34. La gente esta contenta con sus letrinas?
Si:___ No:___ Mas o menos:___

Mas o menos que porcentage de las familias usan sus letrinas (en lugar de defecar en el campo)? _____%

35. Han tenido problemas con las letrinas? Si:___ No:___

Cuales fueron dichos problemas?

OPERACION Y MANTENIMIENTO DE LAS LETRINAS:

36. Es la O y M de las letrinas adecuada?
Si:___ No:___ Mas o menos:___

Comentarios y observaciones:

REHABILITACION DE LAS LETRINAS:

37. Las letrinas han tenido algun tipo de rehabilitacion?
Si:___ No:___

Comentarios y observaciones:

38. Las letrinas actualmente requieren algun tipo de rehabilitacion?
Si:___ No:___

Comentarios y observaciones:

TECNOLOGIA APROPIADA DE LAS LETRINAS:

39. La tecnologia utilizada ha sido apropiada?
Si:___ No:___ Mas o menos:___

Comentarios y observaciones:

40. La tecnologia utilizada incluyo alguna novedad, como por ejemplo el uso de una tecnologia apropiada experimental o demonstrativa? Si:___ No:___

Comentarios y observaciones:

DISENO Y CONSTRUCCION DE LAS LETRINAS:

41. Cuantos jornales de trabajo hizo cada familia para construir su letrina?

42. El diseno de las letrinas es adecuado?: Si:___ No:___

Comentarios y observaciones:

43. La construccion de las letrinas es adecuado?: Si:___ No:___

Comentarios y observaciones:

ENTREVISTA CON UNA MUJER DE UNA FAMILIA QUE HA BENEFICIADA POR EL PROYECTO: CUESTIONARIO Y OBSERVACIONES A NIVEL DE LA COMUNIDAD

Fecha_____
Entrevistador_____
Comunidad_____
Provincia_____
Persona entrevistada:
_____
Edad:_____anos.
Puestos de la(s) entrevistada(s):
Es una madre: Si:___ No:___
Tiene los siguientes puestos:
Miembro de la Junta Administradora:___
Puesto en la Junta:_____
Miembro del Club de Madres:___
Puesto en el Club:_____
Otro:_____
Ninguno:____

1. Sabe usted cual es el trabajo que realiza IEOS en la comunidad?

   Ha recibido usted o su familia algun beneficio? Cual?

2. Les pidieron a ustedes su opinion para realizar el proyecto?

   Estaban de acuerdo? Si es no, porque?

3. De que manera participo o colaboro usted o su familia para el desarrollo del proyecto?

4. Conoce usted cual es el trabajo que realiza el promotor(a) de IEOS en la comunidad?

   Ha tenido contacto usted con el(ella)?

   Que tipo y frecuencia de comunicacion o contacto ha tenido usted con el promotor(a)?

ENTREVISTA CON UNA MUJER DE UNA
FAMILIA QUE HA BENEFICIADA POR EL PROYECTO:
CUESTIONARIO Y OBSERVACIONES A NIVEL DE LA COMUNIDAD

Comunidad:_____

Persona entrevistada:_____

5. Que apoyo o ayuda ha recibido usted del promotor(a) de IEOS?

   Como lo considera?

   Quisiera que continuara igual o prefiere otro tipo de apoyo? Cual?

6. Lo que usted sabe sobre salud, agua y saneamiento, donde lo aprendio?

   Por que medios?

   Que opina de esta manera de aprender?

7. Aplica usted en su vida diaria lo que aprendio?

   Porque?

   En que?

8. Ha recibido charlas, visitas en su casa por parte del pormotor(a)?

   Materiales educativos? Que materiales?

   Lo puede mostrar?

   Sobre que hablo el promotor(a) o los materiales educativos?

9. De que manera participa usted en el trabajo que realiza el promotor(a)?

   Le gusta, que opina?

ENTREVISTA CON UNA MUJER DE UNA
FAMILIA QUE HA BENEFICIADA POR EL PROYECTO:
CUESTIONARIO Y OBSERVACIONES A NIVEL DE LA COMUNIDAD

Comunidad:_____

Persona entrevistada:_____

10. Tiene letrina en su casa?

Si no tiene, porque no la ha construido?

Si tiene:

que lo motivo a construirla?

por medio de quien la construyo?

que tuvo que poner de su parte?

esta satisfecho con el trabajo?

11. Que le gusta y que no le gusta de la letrina que construyo?

12. Usan los ninos la letrina?

Como hacen para hacer sus necesidades, si no la usan, porque y como?

13. Que cuidados tiene con los ninos despues de hacer sus necesidades y antes de comer?

14. Que debe hacer con los papeles usados y como cuidar la letrina?

15. De donde obtiene el agua para el uso de la casa?

Que problemas tiene en tomar agua de ese sitio?

Como es el agua que recibe:

es limpia?
buen sabor?
abundante?
permanente?

16. Donde almacena el agua para beber?

Que cuidados tiene con ella?

ENTREVISTA CON UNA MUJER DE UNA
FAMILIA QUE HA BENEFICIADA POR EL PROYECTO:
CUESTIONARIO Y OBSERVACIONES A NIVEL DE LA COMUNIDAD

Comunidad:_____

Persona entrevistada:_____

17. A quien pertenece el sistema de agua?

A quien se le paga las cuotas (tarifas)?

Como considera las cuotas (tarifas)?

Que opina de estar pagando?

o cree que deberia de pagarse las cuotas?

18. Que beneficios ha tenido ahora con el agua?

Como considera que seria mejor?

19. Porque cree que da diarrea?

Como se trata?

Como se previene?

20. Existen grupos organizados en la comunidad que se preocupen por la salud y bienestar de la comunidad?

Quienes son?

Quien los organizo?

21. En que participa la mujer para solucionar problemas de la comunidad?

22. Que participacion tiene la mujer en las organizaciones existentes, que puestos ocupa, si es no, porque no participa?

ENTREVISTA CON UNA MUJER DE UNA
FAMILIA QUE HA BENEFICIADA POR EL PROYECTO:
CUESTIONARIO Y OBSERVACIONES A NIVEL DE LA COMUNIDAD

Comunidad:_____

Persona entrevistada:_____

AGUA POTABLE:

23. El sistema de agua potable funciona en su casa?
Si:___ No:___ Mas o menos:___

Funciona todo el ano? Si:___ No:___

Comentarios:

Durante los dias que funciona, cuantas horas por dia (promedio) llega el agua a su casa? _____horas/dia.

Si el agua no llega a su casa, o llega pocas horas, tiene ud. un idea porque es asi?

24. El agua que llega a su casa parece limpia?
Si:___ No:___ Mas o menos:___

25. Otros comentarios en relacion al funcionamiento del sistema de agua:

→ 26. Cuanto tiempo esta ahorrando cada dia (en lugar de ir lejos para traer agua)?

27. En el caso que el agua no llega hasta su casa (o llega insuficientemente), a donde va ud. y su familia para traer agua?

Cual tipo de fuente de agua se usa:

→ Cuanto tiempo por dia dedica a este tarea:

Como es la calidad del agua:

28. Cuanto es la tarifa mensual para el uso del sistema de agua?
_____Sucres

29. Su familia paga la tarifa mensual?

A quien la paga?

Si no la paga, porque?

ENTREVISTA CON UNA MUJER DE UNA
FAMILIA QUE HA BENEFICIADA POR EL PROYECTO:
CUESTIONARIO Y OBSERVACIONES A NIVEL DE LA COMUNIDAD

Comunidad:_____

Persona entrevistada:_____

30. Como le parece la tarifa: alta:___ regular:___ baja:___

Requiere algun sacrificio para poder pagar la tarifa?
(por ejemplo, tiene que comer menos, o tiene que dejar la compra de alguna cosa que desea)?

31. Con que contribuyo la familia para la construccion del sistema:

Dinero? (Cuanto?)

Materiales?

Mano de obra (cuantos jornales):

LETRINA:

32. Tiene su casa una letrina? Si:___ No: ___

Que tipo de letrina es:
- A. De pozo seco con un tubo de ventilacion:___
- B. Con sello hidraulico de descarga minima:___
  Cuantos litros requiere para vaciarla?_____litros
- C. Tradicional (pozo seco):___
- D. Alcantarillado:___
- E. Describela si es de otro tipo:

33. Como le parece su letrina?

En que condicion esta: Buena:___ Mala:___

Es una cosa buena?

Tiene olores fuertes?

Atrae moscas?

Ud. tiene miedo que su nino puede caer en la letrina?

34. Todos en su familia utilizan su letrina?

36. Como se ha beneficiado ud. y su familia por la letrina?

36. Con que contribuyo la familia para la construccion de su letrina:

Dinero? (Cuanto?)

Materiales?

Mano de obra (cuantos jornales):

ENTREVISTA CON UNA MUJER DE UNA
FAMILIA QUE HA BENEFICIADA POR EL PROYECTO:
CUESTIONARIO Y OBSERVACIONES A NIVEL DE LA COMUNIDAD

Comunidad:_____

Persona entrevistada:_____

OTROS COMENTARIOS Y OBSERVACIONES:

ANNEX G

Doctor **REINALDO GRUESO**, Health Analyst/Team Coordinator, is a doctor specializing in public health, nutrition, hospital management, and health economy with more than 30 years of experience in these fields. Dr. Grueso has worked in all countries of Latin America as a short-term and long-term consultant of USAID, the Pan-American Health Organization/World Health Organization, the International Labor Organization, and the World Bank. He is the author of approximately 40 studies relating to the development and management of health and applied nutrition. He speaks and writes Spanish (mother tongue), as well as English and he reads French. He has master's degrees in public health and nutrition from Columbia University of New York, and he is a Colombian citizen. He presently resides in Bogotá, Colombia.

Doctor **ENRIQUE GIL-BELLORIN**, a Specialist in Training Health Education of the Evaluation Team, is a doctor with degrees in epidemiology and diseases transmitted by vectors and environmental recovery. He has accomplished various operational projects in health management and epidemiology in several government institutions. He has provided short-term advisory services in various countries regarding design and evaluation of environmental recovery projects, health education, and diseases transmitted by vectors, sponsored by the Pan-American Health Organization/World Health Organization, UNICEF, USAID, and Johns Hopkins University. Presently, he is an advisor to the Pan-American Health Organization/World Health Organization in Honduras for the area of diseases transmitted by carriers as well as coordinator of the Urban Environmental Recovery and Health Education Project of the "Cooperative Housing Foundation" being carried out through various private development organizations in Honduras. He currently lives in Tegucigalpa, Honduras.

Engineer **ANDRES KARP**, a Specialist in Sanitary Engineering on the Evaluation Team, has 20 years of technical and administrative experience in water supply based on pipes, manual pumps, and basic sanitation for rural areas and disadvantaged districts. He worked in Latin America and in various French-speaking African countries and, on a more limited scale, in South Asia. He also has experience in the economic and social evaluation of projects, as well as in master plans and the design of water and sewage systems on the municipal level. He is a professional engineer registered in the state of Florida, United States. He speaks English (mother tongue), Spanish and French. He has degrees in sanitary engineering awarded by the Georgia [Technology] Institute, and in mechanical engineering awarded by Stanford University, both in the United States; he is a citizen of that country. He currently lives in the city of Quetzaltenango, Guatemala.

ANNEX H

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Goal: The broader objective to which this project contributes	Measures of Goal Achievements:		Concerning long term value of Program/project:
To improve the health status of infants and children under age five in Ecuador	Significant decreases of morbidity (especially prevalence of diarrheal diseases and mortality among infants and children under five, in project areas	Vital statistics Epidemiological data Political stability Survey data	No natural disasters including epidemics Debt repayment on schedule Annual certification on GOE re drug control authorized by USG Continued GOE commitment to supporting WSS/S construction People are willing to change water use behavior

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Purpose To strengthen IEOS' capability to assist rural communities in eight provinces to (1) install safe water supply systems and latrines/toilets (RWS&S systems); (2) use the water and latrines/ toilets to improve family health; and (3) maintain and improve the systems in the future	Conditions that will indicate purpose has been achieved: End of project status - IEOS decentralization model fully institutionalized - Efficiency and cost-effectiveness of IEOS system construction operations improved - Potable water and sanitation facilities provided to about 320,000 persons in eight Project provinces - IEOS applying a financially viable operations maintenance program on a yearly basis - 1,200 Rural Community Boards established and effectively operating and maintaining water and sanitation systems - Served populations use proper sanitation practices - Served population using greater quantity of water	Survey data Service statistics Review of IEOS provincial office procedures Observational studies	Affecting purpose-to-goal link: GOE's political and econo-cal support for continued investments in the sector IEOS provides sufficient human and financial resources to implement the project IEOS demonstrates its ability to use funds effectively and efficiently That a positive correlation exists between improved health status and reduced infact mortality FONASA fund continues to receive adequate resources Trained staff is available Education is improved among beneficiaries

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Outputs	Magnitude of Outputs necessary and sufficient to achieve purpose		Affecting output-to-purpose link Assumptions:
A. Systems Planning and Construction Program Functioning Effectively	1. IEOS RWS&S construction planning and management policies and procedures codified and adopted	Field inspections Site visits	GOE is willing and able to develop and implement new policies in the sector
	2. The decentralized "operational module" approach adopted and functioning for all RW&S construction in the eight Project provinces	IEOS records Survey reports	GOE provides adequate budgetary support to IEOS
	3. 640 new RW&S serving approximately 320,000 persons installed with ESF, FONASA and other IEOS funds and functioning in the eight Project provinces		Continued support by IEOS management for systematic change in procedures and their application
	4. IEOS financial administration strengthened		
	5. IEOS province-level RWS&S project selection, monitoring and evaluation system developed		
B. Hygiene Education Program Implemented			
	1. Hygiene practices analyzed and behavior change messages and communications techniques developed	KAP Surveys	

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Outputs			Affecting output-to-purpose link Assumptions:
	2. IEOS' institutional capability to plan and manage an ongoing rural hygiene education program established		
C. Operation and Maintenance Programs developed and institutionalized	1. IEOS O&M program developed and operating	Field inspections site visits	
	2. Realistic O&M cost projections developed per province	IEOS records survey reports	
	3. User fee rates and collection procedures revised to be self-sufficient		
D. Appropriate Technology Program Institutionalized	1. Four A.T. studies completed and findings incorporated in IEOS RW&S program		

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS

In ($000)

INPUTS

	A.I.D.	GOE	Community
Technical Assistance	$1,335		
Training	$ 595	200	
Commodities	$ 625	550	
Operating Costs	$ 904	874	
O&M Warehouses	$ 120	50	
Evaluation/Audit	$ 200		
Systems Construction: FONASA		11,200	2,600
ESF LC		$ 1,600	
	$3,781	$12,850	
Contingency/Inflation	219	1,287	
TOTAL	$4,000	$15,761	$2,600

USAID Controller Office records

GOE budget/Implementing agency records

(1713M)

ANNEX A
Page 5 of

ANEXO I

SISTEMAS DE AGUA POTABLE Y SANEAMIENTO RURAL CONSTRUIDOS DURANTE EL PROYECTO

Las paginas a continuacion presentan lo siguiente:

1. Dos cuadros que vienen de la primera edicion, en el ano 1991, de la revista UCETA, publicada por IEOS. Segun el articulo que acompana a estos dos cuadros, "en este periodo quecomprende desde el 1 de marzo hasta el 31 de julio de 1990, en las construcciones de los proyectos de agua potable y letrinas, hemos obtenido los Avances Fisicos que mostramos en el cuadro No. 1. En el cuadro No. 2 se presenta un detalle de los proyectos contemplados en la segunda fase del Programa."

   El equipo evaluador ha marcado, con boligrafo, en el margin de cada cuadro, la fecha de la entrega de cada obra, segun informacion proveido por el component de construcciones de IEOS. Se nota que muchos fueron entregada antes de la firma del convenio que corresponde al comienzo del proyecto actual, en julio de 1989.

2. Una lista preparada por el componente de construcciones de IEOS, de Proyectos Financiados Con Fondos USAID.

3. Un analisis por el equipo de evaluacion, de la informacion en los mencionados cuadros, aplicando fechas de entregas de obras segun la mencionada lista.

4. Una lista preparada por el componente de construcciones de IEOS, de Proyectos Entregados Desde 1990 Con Otros Financiamientos.

5. Un analisis por el equipo de evaluacion, de la informacion en la lista de Proyectos Entregados Desde 1990 Con Otros Financiamientos.

CUADRO Nº1
PROYECTOS INAUGURADOS
PRIMERA FASE

PROVINCIA		NOMBRES COMUNIDAD	POBLACION BENEFICIADA	AVANCE FISICO (%)		OBSERVACIONES	Fecha de entrega
EL ORO	1.	Torata	875	100	100	Inaugurado	1989
	2.	Guabillo Balsalito	400	100	100	Inaugurado	?
	3.	Sta. Cruz la Victoria	800	30	30	En ejecución	?
	4.	La Quebrada	300	100	100	Inaugurado	
PICHINCHA	1.	Sn. Vicente de Guayllabamba	900	100	100	Inaugurado	6-89
	2.	Sigsipamba Coniburo	800	100	100	Inaugurado	2-89
	3.	Panzaleo	342	100	100	Inaugurado	5-89
	4.	Mojanda Chico	267	100	100	Inaugurado	4-89
	5.	Regional Puichig	1300	50	98	En ejecución	8-90
	6.	Regional La Moca	650	90	100	Inaugurado	4-90
CHIMBORAZO	1.	Huacona San Vicente	360	100	100	Inaugurado	11-88
	2.	Guiltus	300	100	100	Inaugurado	4-89
	3.	Macají-Sn José - Sn Fco	905	100	100	Inaugurado	4-89
	4.	El Citado	250	100	100	Inaugurado	2-89
	5.	San Jacinto - San Vicente	340	100	100	Inaugurado	10-89
	6.	Cochapamba	408	100	100	Inaugurado	1-90
	7.	San Juan de Trigoloma	382	0	100	Inaugurado	3-90
	8.	Tutupala - San Francisco	518	99	100	Inaugurado	5-90
	9.	Compañía Cuz Loma	335	42	100	Inaugurado	6-90
	10.	Peiteteg	317	0	100	Inaugurado	11-90
BOLIVAR	1.	Reg. Chalata	2195	100	100	Inaugurado	7-89
NO PERTENECE AL PROYECTO →	2.	San Gerardo	330	100	100	Inaugurado	88
	3.	San Eduardo	228	98	98	Paralizado	—
	4.	Sigsipamba	280	100	100	Inaugurado	10-89
AZUAY	1.	Patadel	360	100	100	Inaugurado	11-89
	2.	Guasag	204	100	100	Inaugurado	1-89
	3.	Reg. El Almibar	1500	92	92	Paralizado	6-92
	4.	La Cruz	604	100	100	Inaugurado	11-89
	5.	Granda	450	100	100	Inaugurado	7-89
	6.	Chicty Alto	150	100	100	Inaugurado	7-89
	7.	Pata Pata	600	100	100	Inaugurado	6-89
	8.	Shaushin	210	100	100	Inaugurado	7-89
	9.	Pastopamba	300	100	100	Inaugurado	7-89
	10.	Cataviña 1 y 2	366	67	100	Inaugurado	4-90
	11.	San Antonio Tuntag - Huintul	402	85	100	Inaugurado	4-90
	12.	Caledoneas	330	90	100	Inaugurado	6-90
IMBABURA	1.	Getzemaní	193	100	100	Inaugurado	5-89
	2.	Tangalí	360	100	100	Inaugurado	1-89
	3.	Ushaloma	330	100	100	Inaugurado	5-89
	4.	Pugarán	242	100	100	Inaugurado	8-89
	5.	Padre Motilón y Chupa	360	100	100	Inaugurado	9-89
	6.	Quinta Yuquín	806	100	100	Inaugurado	12-89
	7.	El Milagro	322	30	95	Inaugurado	12-89
	8.	Sta. Bárbara	294	32	40		3-91
	9.	Nápoles	237	0	92	Inaugurado	3-91
TUNGURAGUA	1.	San Antonio	368	100	100	Inaugurado	7-89
	2.	San José	700	100	100	Inaugurado	8-89
	3.	Zarangay	600	100	100	Inaugurado	7-89
	4.	Regional Florida Chambag	1180	100	100	Terminado	8-89
	5.	Angahuana Alto	1000	41	100	Terminado	7-90
	6.	Llimpe	905	38	100	Inaugurado	11-90
	7.	Artezón	660	67	100	Inaugurado	6-90
COTOPAXI	1.	Yacunpungo Alto y Bajo	300	100	100	Inaugurado	3-90
	2.	Matango - Pucará	460	95	100	Inaugurado	3-90
	3.	Tingo - Collas	750	100	100	Inaugurado	3-90
	4.	Regional Rumipamba	2490	0	20		9-91
CARCHI	1.	El Tambo	580	0			5-90
	2.	Alor - El Rosal Angel.	550	0	52		6-91
	3.	Chután Alto	296	0	70		3-91

CUADRO Nº2
PROYECTOS EN EJECUCION
SEGUNDA FASE

Fecha de entrega

PROVINCIA	COMUNIDAD	POBL. BENEF.	AVANCE ANTERIOR	AVANCE ACTUAL*	OBSERVACIONES
EL ORO	El Carmen	320	96	97	8-91
	Cotopaxi	900	45	64	12-91
PICHINCHA	Cataguango	450	100	100	Inaugurado 2-91
	Cachipicha	740	100	100	Inaugurado 4-91
	Pilopata	390	100	100	Inaugurado 6-91
CHIMBORAZO	Nizag	900	100	100	Inaugurado 5-91
	Santa Rosa	480	60	80	
	La Merced	400	80	95	
	Llallanag	300	50	95	
	Shobolpamba	430	60	85	
TUNGURAHUA	Misquillí	2790	94	99	Inaugurado 7-91
	Condenzan	1570	35	50	1-92
AZUAY	San José de Raranga	1250	100	100	Inaugurado 4-91
	Santa Rosa	536	85	93	8-91
	San Vicente	616	79	90	8-91
IMBABURA	El Morlán	600	70	92	8-91
	Rumipamba	297	88	98	8-91
	Cambugán	335	29	52	1-92
CARCHI	El Tambo	580	100	100	Inaugurado 5-91
	Alor - El Rosal	550	95	97	6-91
	Chután Alto	296	98	100	Inaugurado 3-91
	Tumbatú	389	80	85	3-91
	Las Lajas	262	70	80	8-91
	Milagro	692	20	40	5-91
COTOPAXI	La Josefina	740	78	90	1-91
	Tandacato	530	100	100	Inaugurado 5-91
	Reg. Rumipamba	2500	100	100	Inaugurado 9-91

* Calculado hasta junio de 1991

[illegible]
[illegible]

PROVINCIA	CANTON	LOCALIDAD	SISTEMA	POBLAC.	FECHA ENTREGA
EL ORO		[illegible]	AP/LET	[illegible]	
		LA QUEBRADA	AP/LET	300	≥1990 ?
	MACHALA	EL CARMEN	AP	[illegible]	[illegible]
	EL GUABO	[illegible]	AP/LET	200	[illegible]
PICHINCHA	MEJIA	[illegible]	AP/LET	1,300	[illegible]
	MEJIA	[illegible]	AP/LET	[illegible]	[illegible]
	MEJIA	[illegible]	AP/LET	342	89-05
	QUITO	[illegible]	AP/LET	740	91-04
	QUITO	S. V. DE GUAYLLABAMBA	AP/LET	240	89-07
	QUITO	[illegible]	AP/LET	1,200	[illegible]
	QUITO	[illegible]	AP/LET	450	[illegible]
	QUITO	[illegible]	AP/LET	[illegible]	[illegible]
	QUITO	[illegible]	AP/LET	800	[illegible]
	RUMIÑAHUI	[illegible]	AP/LET	650	[illegible]
CHIMBORAZO	ALAUSI	EL CITADO	AP/LET	250	[illegible]
	ALAUSI	S. JACINTO-S. VICENTE	AP/LET	340	[illegible]
	ALAUSI	NIZAG	AP/LET	1,000	92-05 [illegible]
	COLTA	COMPAÑIA CRUZ LOMA	AP/LET	335	90-06 [illegible]
	COLTA	HUACONA-SAN VICENTE	AP/LET	360	[illegible]
	GUAMOTE	VIA ORIENTE	AP/LET	2,073	[illegible]
	GUANO	TUTUPALA-SAN FCO.	AP/LET	518	[illegible]
	GUANO	COCHAPAMBA	AP/LET	408	[illegible]
	PALLATANGA	S. JUAN DE TRIGOLOMA	AP/LET	382	[illegible]
	RIOBAMBA	GUILTUS	AP/LET	300	[illegible]
	RIOBAMBA	RIOBAMBA (BODEGAS)			[illegible]
	RIOBAMBA	PELTETEC	AP/LET	317	[illegible]
	RIOBAMBA	HACATI-S. JOSE-S. FCO.	AP/LET	905	[illegible]
AZUAY	CUENCA	BODEGAS			[illegible]
	GIRON	CALEDONIAS	AP/LET	420	[illegible]
	GUALACEO	GRANDA	AP/LET	430	[illegible]
	NABON	LA CRUZ	AP/LET	602	[illegible]
	NABON	PATADEL	AP/LET	280	[illegible]
	PAUTE	SAN ANTONIO-TUNTAC	AP/LET	208	[illegible]
	PAUTE	SANTA ROSA	AP/LET	536	[illegible]
	PAUTE	SAN VICENTE	AP/LET	616	[illegible]
	PAUTE	[illegible]	AP/LET	300	[illegible]
	PAUTE	[illegible]	AP/LET	150	[illegible]
	PAUTE	[illegible]	AP/LET	[illegible]	[illegible]
	PAUTE	[illegible]	AP/LET	210	[illegible]
	SIGSIG	[illegible]	AP/LET	1,230	[illegible]
	STA. ISABEL	[illegible] 1 Y 2	AP/LET	[illegible]	[illegible]
	STA. ISABEL	[illegible]	AP/LET	2,000	[illegible]
	STA. ISABEL	PATA PATA	AP/LET	[illegible]	[illegible]

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PROYECTOS FINANCIADOS
CON FONDOS USAID

PROVINCIA	CANTON	LOCALIDAD	SISTEMA	POBLAC	FECHA ENTREGA
IMBABURA	ANTONIO A	ESPERANZA DE S ROSUF	LET	490	91-12
	COTACACHI	NAPOLES (6 DE JULIO)	AP/LET	237	91-03
	COTACACHI	EL MORLAN	AP/LET	600	91-03
	COTACACHI	QUIROCHA	LET	785	91-12
	IBARRA	ANGOCHAGUA	LET	350	91-11
	IBARRA	PUNGALAN	AP/LET	242	89-08
	IBARRA	RUMIPAMBA-AMBUQUI	AP/LET	297	91-08
	IBARRA	QUIZEMANI	AP/LET	193	89-05
	IBARRA	ORIBATO	LET	720	91-12
	IBARRA	EL MILAGRO	AP/LET	345	90-10
	OTAVALO	TANGALI	AP/LET	360	89-01
	OTAVALO	USHALOMA	AP/LET	330	89-05
	OTAVALO	SANTA BARBARA	AP/LET	300	91-03
	OTAVALO	PADRE MOTILON Y CHUPA	AP/LET	360	89-09
	OTAVALO	CAMBOGAN DE INQUINCHO	AP/LET	400	91-01
	OTAVALO	SAN JUAN ALTO	LET	516	91-12
	OTAVALO	QUALSAQUI	LET	1,150	91-12
	PIMAMPIRO	QUINTA YUQUIN	AP/LET	306	89-12
TUNGURAHUA	AMBATO	REG. MISQUILLI	AP/LET	3,500	91-07-27
	AMBATO	REG. CONDENZAN	AP/LET	2,050	92-01-18
	AMBATO	ANGAHUANA ALTO	AP/LET	1,080	90-07-17
	PELILEO	ZARANGAY	AP/LET	600	89-07-21
	PELILEO	ARTEZON	AP/LET	900	90-06-20
	PELILEO	REG. FLORIDA-CHAMBAY	AP/LET	1,180	89-08-04
	PELILEO	SAN JOSE	AP/LET	700	89-08-14
	PELILEO	SAN ANTONIO	AP/LET	368	89-07-20
	QUERO	LLIMPE CHICO Y GRANDE	AP/LET	1,300	90-11-30
COTOPAXI	LA MANA	LA JOSEFINA	AP/LET	850	91-01-01
	LATACUNGA	TANDACATO	AP/LET	750	90-05
	LATACUNGA	YACUPUNGO ALTO Y BAJO	AP/LET	300	90-03-04
	LATACUNGA	MATANGO PUCARA	AP/LET	460	90-03-04
	PUJILI	TINGO COLLAS	AP/LET	750	90-03-31
	SALCEDO	REG. RUMIPAMBA	AP/LET	3,000	91-09
CARCHI	BOLIVAR	TUMBATU	AP/LET	380	91-03
	BOLIVAR	ALOR EL ROSAL	AP/LET	480	91-06
	BOLIVAR	LAS LAJAS	AP/LET	400	91-03
	MIRA	RG.EMPEDRAD.-MILAGRO	AP/LET	600	90-05
	MONTUFAR	CHUTAN ALTO	AP/LET	300	91-07
	TULCAN	EL TAMBO	AP/LET	700	90-06
BOLIVAR	GUARANDA	RG.CHALATA-NEGROLLACO	AP/LET	2,193	89-09
	ECHEANDIA	SAN GERARDO	AP/LET	330	88
	CHILLANES	SIGSIPAMBA	AP/LET	280	89-10

PROYECTOS FINANCIADOS CON FONDOS USAID

Calculation por Ing. A. Karp, en base de los datos proveidos por la Revista UCETA (1991) y por el componente de Construccion

PROVINCIA	POBLACIONES DE LOS PROYECTOS CON FECHA DE ENTREGA			
	antes de 7/89	entre 8/89 y 12/89	a partir de 1/90	OBSERVACIONES
EL ORO: Cuadro 1:	875			
			400	(fecha desconocida)
			800	(fecha desconocida)
			300	(fecha desconocida)
EL ORO: Cuadro 2:			320	
			900	
PICHINCHA: Cuadro 1:	900			
	800			
	342			
	267			
		1300		
	650			
PICHINCHA: Cuadro 2:			450	
			740	
			390	
CHIMBORAZO: Cuadro 1:	360			
	300			
	905			
	250			
		340		
			408	
			382	
			518	
			335	
			317	
CHIMBORAZO: Cuadro 2:			900	
			480	No esta confirmado
			400	No esta confirmado
			300	No esta confirmado
			430	No esta confirmado

continuacion...

PROVINCIA	POBLACIONES DE LOS PROYECTOS CON FECHA DE ENTREGA			OBSERVACIONES
	antes de 7/89	entre 8/89 y 12/89	a partir de 1/90	
AZUAY: Cuadro 1:		360		
	204			
			1500	
		604		
	450			
	150			
	600			
	210			
	300			
			366	
			402	
			330	
AZUAY: Cuadro 2:			1250	
			536	
			616	
IMBABURO: Cuadro 1:	193			
	360			
	330			
		242		
		360		
		806		
		322		
			294	
			237	
IMBABURO: Cuadro 2:			600	
			297	
			335	
TUNGURAHAU: Cuadro 1:	368			
		700		
		600		
			1180	
			1000	
			905	
			660	
TUNGURAHAU: Cuadro 2:			2790	
			1570	

continuacion...

PROVINCIA	POBLACIONES DE LOS PROYECTOS CON FECHA DE ENTREGA			
	antes de 7/89	entre 8/89 y 12/89	a partir de 1/90	OBSERVACIONES
COTOPAXI: Cuadro 1:			300	
			460	
			750	
			2490	
COTOPAXI: Cuadro 2:			740	
			530	
			2500	
CARCHI: Cuadro 1:			580	
			550	
			296	
CARCHI: Cuadro 2:			580	
			550	
			296	
			389	
			262	
			692	
TOTALES:				
POBLACIONES:	8814	5634	35603	
No. de proyectos:	20	10	52	
Poblacion promedio:	441	563	685	

[illegible]	[illegible]	[illegible]	A.P.	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	A.P.	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]			[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	A.P.	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	A.P.	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	A.P.	300	90-05	[illegible]
	[illegible]	[illegible]	A.P.	[illegible]	91-04	[illegible]
	[illegible]	[illegible]	A.P.	[illegible]	91-04	[illegible]
	[illegible]	[illegible]	A.P.	[illegible]	91-04	[illegible]
	[illegible]	[illegible]	A.P.	300	[illegible]	CONAGA
	[illegible]	[illegible]	A.P.	[illegible]	91-04	IEOS
	[illegible]	[illegible]	A.P.	[illegible]	91-06	CONAGA
	TULCAN	[illegible]	A.P.	300	92-06	IEOS
	MONTUFAR	EL TAMBO	A.P.	400	91-06	CONAGA
	MONTUFAR	EL CHICO-EL CARMEN	A.P.	200	92-06	CONAGA
	TULCAN	CHICAL	A.P.	500	90	IEOS
	TULCAN	HUACA	A.P.	2.000	90-01	CONAGA
	BOLIVAR	PUEBLO NUEVO	A.P.	1.000	90-12	IEOS
	ESPEJO	EL ANGEL	A.P.	4.000	91-10	IEOS
	MONTUFAR	CRISTOBAL COLON	A.P.	300	91-04	CONAGA
	TULCAN	CHAPUEL	A.P.	1.000	92-07	IEOS
COTOPAXI	PANGUA	MORASPUNGO	A.P.	1.000	91-01	CONAGA
	PUJILI	YAHATUSO	A.P.	100	92-11-10	UNICEF
	PUJILI	ZUMBAGUA CENTRO	A.P.	1.000	93-01	UNICEF
	PUJILI	APAGUA	A.P.	400	92-11	UNICEF
	PUJILI	ZUMIRUMI	A.P.	300	92-12-10	UNICEF
	SIGCHOS	ISINLANI CENTRO	A.P.	400	92-09	UNICEF
	SIGCHOS	GUACUMBINI ALTO	A.P.	150	92-12	UNICEF
	SIGCHOS	LLACUSCULI	A.P.	150	92-05	UNICEF
	SIGCHOS	HIERBA BUENA	A.P.	400	93-01	UNICEF
PASTAZA	PASTAZA	JURAGACHI	A.P.	300	91-02	IEOS
	PASTAZA	CAJIMA	A.P.	100	91-04	CONAGA
	PASTAZA	MARTILLO	A.P.	300	91-07	[illegible]
	PASTAZA	CHINCHAY	A.P.	200	90-10	CONAGA
			A.P.			
ZAMORA CH.	ZAMORA	PALANDA	A.P.	600	90-12	AID

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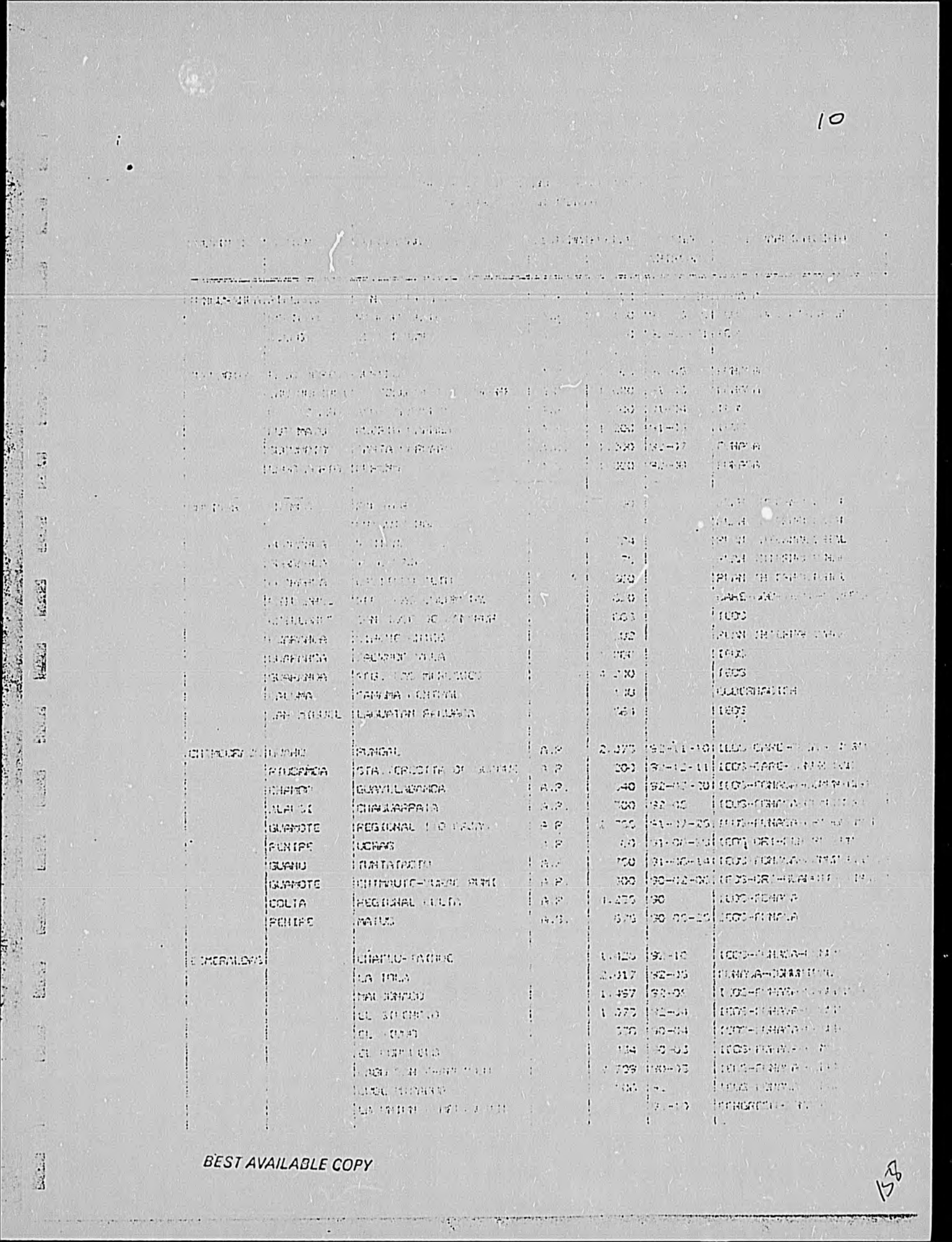

11

[illegible]

[illegible]

PROVINCIA	CANTON	LOCALIDAD	SISTEMA	POBLAC.	FECHA ENTREGA	FINANCIAMIENTO
CAÑAR		CONOCLES		700	92-10	IEOS-P. [illegible]
		GUAPAN HUMAPAMIIUO		706	91-07	IEOS-P. INTERNAL [illegible]
		TOLTOSUL		305	91-08	IEOS-P. INTERNA [illegible]
		CHUICHUN		300	91-08	IEOS-M. MUNICIPAL [illegible]
		SAN CHICO		174	92-12	IEOS-COMUNIDAD
		S.JOSE DE CHIRIPUNGO		225	92-05	IEOS-P. INTERNAC.-COMU.
		S.LUIS RANCHO NEGRO		260	91-09	IEOS-COMUNIDAD
		EL JOAQUIN		225	92-05	IEOS-M. MUNICIPAL-COMUNIDAD
		SAN CARLOS CAJON TAMBO		195	92-05	IEOS-P. INTERNAC.-COMUN.
		REGIONAL MOCALUMA		2 200	91-06	IEOS-P. INTERNAC.-COMUN.
		COMA-I		950	91-12	IEOS-P. INTERNAC.-COMUN.
		[illegible]		1 [illegible]	92-04	[illegible]-COMUNIDAD
		CABIN		204	91-01	IEOS-COMUNIDAD
		[illegible]-HUAYCO		100	92-12	IEOS P. INTERNAC.-COMUN.
		[illegible]		150	93-01	IEOS-M. MUNICIPAL-COMUNIDAD
		[illegible] ALTO		329	93-01	IEOS-P. INTERNAC.-[illegible]
		CHARCA-I		200	90-11	IEOS-P. INTERNAC.-COMUN.
LOS RIOS		REGIONAL GUAYACANES		1.200	90-09	IEOS-CARE-COMUNIDAD
GUAYAS		TRES POSTES (AMPLIAC.)		2.000	90-03	CONGRESO-COMUNIDAD-[illegible]
		OLON (AMPLIACION)		4.000	90-11	FONASA COMUNIDAD
PICHINCHA		PUSUQUI	A P.	250	90-05	IEOS
		VILLA VEGA	A S.	375	90-11	IEOS
		BARRIO CORAZON JESUS	A.P.	300	90-10	IEOS
		CHILLOGALLO	A.P.	500	90-11	IEOS
		COOP.GUAYLLAB.(POLICIA)	A.P.	1.165	91-06	IEOS
		PERUCHO-SAN RAMON	A.P.	400	90-07	IEOS
		SAN JOSE YARUQUI	A.S.	1.346	90-07	FONASA
		BARRIO AMAZONAS PIFO	A S.	2,540	90-07	FONASA
		EL PARAISO	A.P.	300	90-11	IEOS
		STA. TERESITA DE PACTO	A.P.	770	90-08	FONASA
		PIFO	A S.	2,502	90-08	FONASA
		CACHIPICHA	AP-LET	750	91-04	AID
		YARUQUI	A.P	1,346	91-06	FONASA
		CHAUPI MOLINO	A.S.	1.120	091-06	IEOS
		COLMENA ALTA	A.P.	2,350	91-09	IEOS
		LA CONCEPCION	AP-LET	1,200	91-10	FONASA
		COOP. EL PROGRESO	A.S.	620	91-08	
		EL CAJON CALDERON	A.S.	1.200	91-11	IEOS
		STA. ROSA CHILLOGALLO	A S.	2.000	91-06	IEOS
		COOP. OFICIALES POLICIA	LET.	990	91-12	IEOS
		CARAPUNGO	AP-LET	1,700	92-06	AID
		LOS VIÑEDOS	A.P.		92-06	
		COOP. NUEVO AMANECER	A S		92-06	IEOS
		COMUNA CENTRAL	A.S.	675	92-07	IEOS

BEST AVAILABLE COPY

PROYECTOS ENTREGADOS DESDE 1990
CON OTROS FINANCIAMIENTOS

PROVINCIA	CANTON	LOCALIDAD	SISTEMA	POBLAC.	FECHA ENTREGA	FINANCIAMIENTO
PICHINCHA		COOP. NUEVO AMANECER	A.P.		92-06	
		UNION-CHAUPIESTANCIA	AP-LET	1,400	92-07	FONASA
		CHAUPITOLA-MILAGRO	A.P.	2,000	92-08	FONASA
		REG. LA MOCA-S. ANTONIO	A.P.	650	90-04	AID
		EL TOHA	A.S.	535	90-05	
		~~EL TOHA~~	~~A.P.~~	~~535~~	~~90-04~~	
		COCHAPAMBA-L. MOA-PARUNGA	A.P.	625	90-11	FONASA
		TOCACHI	A.P	1,200	90-10	FONASA
		HUAYLLARO CHICO	A.P.	400	90-04	FONASA
		SANTA EULALIA	A.P.	195	90-10	FONASA
		PICALQUI	AP-LET	600	90-04	IEOS
		SAN JOSE CHICO	AP-LET	352	90-07	IEOS
		CHICINAHUI	A.P.	234	90-03	IEOS
		REGIONAL PUICHIG	AP-LET	1,300	90-08	AID
		SAN CRISTOBAL-PAYAMBICHO	A.S.	310	90-04	IEOS
		BARRIOS ALOAG	AP-LET	1,510	91-02	FONASA
		SAN PEDRO PILOPATA	A.P.	390	91-06	AID
		CATANUANGO	AP-LET	450	91-02	AID
		EL ROSARIO AYMESA	A.P.	1,500	92-08	IEOS
		SAN VICENTE DEL NILA	A.P.	1,000	91-03	FONASA
		LA MAGDALENA	A.P.	1,953	92-01	FONASA
		ALPAHUMA	A.P.	1,200	91-01	AID
		FAJARDO	A.S.	1,500	91-11	IEOS
MORONA S.	PALORA	NUEVA TARQUI	A.P.	200	91-02	FONASA
		TUTINENTZA	A.P.	300	90-12	IEOS
		S. J. TAISHA	A.P.	350	90-03	FONASA
		WAWAIME	A.P.	150	90-07	IEOS
		CHIVIAZA	A.P.	325	90-12	IEOS
		UTUM-ILUS	A.P.	150	90-12	IEOS.
		SAN LUIS DE ALHIO	A.P.	200	91-07	FONASA
		AGUA SANTA	A.P.	200	91-03	
		CUMANDA	A.P.	250	91-03	
		INDANZA	A.S.	550	91-07	FONASA
		BELEN	A.P.	450	90-07	IEOS
		HUAMBI	A.P.	1,614	91-07	FONASA
		CAMBANACA	A.P.	850	92-07	FONASA
		REGIONAL MACAS	A.P.	7,000	92-05	IEOS
		BERMEJOS	A.P.	200	92-01	FONASA
		CHIGUINDA	A.P.	300	92-01	FONASA
NAPO		LORETO	A.P.	750	91-02	FONASA
		PUERTO NAPO	A.P.	1,170	90-06	FONASA
		SAN LUIS	A.P.	120	91	MUNICIPIO TENA
		JOYA DE LOS SACHAS	A.P.	3,000	90-10	FONASA
		NARUPA	A.P.	120	90-10	AID
		SAN MATIAS	LET.	100	91	IEOS
		CHIGOTA	LET.	150	91-10	IEOS

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PROYECTOS ENTREGADOS DESDE 1990
CON OTROS FINANCIAMIENTOS

PROVINCIA	CANTON	LOCALIDAD	SISTEMA	POBLAC.	FECHA ENTREGA	FINANCIAMIENTO
MANABI	PORTOVIEJO	[illegible]	A.P.	500	91-10	
	BOLIVAR	[illegible]	A.P.		91-07	
	BOLIVAR	MEMBRILLO	A.P.	200	[illegible]	
	BOLIVAR	PLATANALES	A.P.	1.000	92-03	
	BOLIVAR	[illegible]	A.P.	2.000	92-01	
	EL CARMEN	PUERTO NUEVO	A.P.	400	92-09	
	EL CARMEN	STA. MARIA-21 DE MAYO	A.P.	1.000	92-03	
	SANTA ANA	[illegible]-AYACUCHO	A.P.	741	90-12	
	SANTA ANA	CHAMUCAME	A.P.	125	90-06	
	SANTA ANA	LAS PIEDRAS	A.P.	298	90-12	
	JUNIN	MENDOZA	A.P.	452	90-10	
	MANTA	[illegible]	A.P.	1.040	90-06	---
	FLAV ALFARO	EL ZAPALLO	AP-LET	597	90-06	
	PAJAN	[illegible]	A.P.	719	92-12	
IMBABURA	OTAVALO	LA BOLSA-GUANANSI	A.P.	900	90-01	IEOS-JEV-UAOT
	OTAVALO	CUMBICUYAY	AP-LET	435	90-03	IEOS-[illegible]
	OTAVALO	IMBABUELA ALTO Y BAJO	A.P	800	91-08	IEOS-CARE-[illegible]
	OTAVALO	REGIONAL PANECILLO	A.P.	2.000	91-07	IEOS-CARE
	OTAVALO	COOP. ANGEL ESCOBAR	A.S.	1.000	92-08	IEOS
	IBARRA	BARRIO FLORAL P.	A.S.	200	90-03	IEOS-EMAPA
	IBARRA	LOMAS DEL EJIDO	A.S.	1.000	90-04	IEOS
	IBARRA	TANGUARIN SUR	A.P.	600	91-07	IEOS-EMAPA-[illegible]
	COTACACHI	LA DELICIA-PEÑAHERRERA	A.P.	230	91-10	IEOS
	A. ANTE	LA ESPERANZA DE [illegible]	A.P.	600	92-08	FONADA
EL ORO	ARENILLAS	MIRAFLORES-LOS [illegible]	A.S.		91-11	
	SANTA ROSA	LA AVANZADA-BELLAVISTA	A.P.	970	90-06	
	MACHALA	EL RETIRO	A.P.	1300	91-05	
	ATAHUALPA	AYAPAMBA	A.P.	275	90-06	

1993-febrero-10

PROYECTOS ENTREGADOS DESDE 1990 CON OTROS FINANCIAMIENTOS

Calculacion por Ing. A. Karp, en base de los datos proveidos por IEOS

PROVINCIA	POBLACIONES DE LOS PROYECTOS	
CARCHI	420	
	1280	
	900	
	560	
	3000	
	1500	
	300	
	200	
	750	
	300	
	480	
	200	
	600	
	2000	
	1000	
	4000	
	500	
	1000	
Sub-total:		18990
No. de sistemas:	18	
Pob. promedio:	1055	
COTOPAXI	1800	
	400	
	1100	
	400	
	900	
	600	
	550	
	150	
	620	
Sub-total:		6520
No. de sistemas:	9	
Pob. promedio:	724	
TUNGURAHUA	3000	
	150	
	100	
Sub-total:		3250
No. de sistemas:	3	
Pob. promedio:	1083	

PROVINCIA	POBLACIONES DE LOS PROYECTOS	
PICHINCHA	250	
	375	
	600	
	500	
	1165	
	400	
	1346	
	2540	
	300	
	770	
	2582	
	1346	
	1120	
	2360	
	1200	
	620	
	1200	
	2000	
	990	
	1100	est.
	1100	est.
	675	
	1100	est.
	1450	
	2580	
	535	
	625	
	1200	
	400	
	195	
	630	
	352	
	234	
	810	
	1510	
	1500	
	1600	
	1953	
	1500	
Sub-total:		42713
No. de sistemas:	39	
Pob. promedio:	1095	

continuacion...

	POBLACIONES DE LOS PROYECTOS			POBLACIONES DE LOS PROYECTOS
EL ORO	850 est.		IMBABURA	900
	970			435
	1300			800
	275			2000
				1000
Sub-total:	3395			200
No. de sistemas:	4			1000
Pob. promedio:	849			600
				230
CHIMBORAZO	2073			600
	200			
	640		Sub-total:	7765
	300		No. de sistemas:	10
	2755		Pob. promedio:	777
	60			
	750			
	300			
	4235			
	675			
Sub-total:	11988			
No. de sistemas:	10			
Pob. promedio:	1199			

AZUAY — Nos faltan datos para el Azuay. Por lo tanto, vamos a presumir que el numero de proyectos y la poblacion promedio en el Azuay son iguales a los promedios y las otras 7 provincias.

Sub-total:	13221
No. de sistemas:	13
Pob. promedio:	1017

POBLACION TOTAL:	107842 aprox.
No. de sistemas:	106 aprox.
Pob. promedio:	1017 aprox.

PROYECTOS FINANCIADOS CON FONDOS USAID

Calculation por Ing. A. Karp, en base de los datos proveidos por la Revista UCETA (1991) y por el componente de Construccion

PROVINCIA	POBLACIONES DE LOS PROYECTOS CON FECHA DE ENTREGA			
	antes de 7/89	entre 8/89 y 12/89	a partir de 1/90	OBSERVACIONES
EL ORO: Cuadro 1:	875			
			400	(fecha desconocida)
			800	(fecha desconocida)
			300	(fecha desconocida)
EL ORO: Cuadro 2:			320	
			900	
PICHINCHA: Cuadro 1:	900			
	800			
	342			
	267			
		1300		
	650			
PICHINCHA: Cuadro 2:			450	
			740	
			390	
CHIMBORAZO: Cuadro 1:	360			
	300			
	905			
	250			
		340		
			408	
			382	
			518	
			335	
			317	
CHIMBORAZO: Cuadro 2:			900	
			480	No esta confirmado
			400	No esta confirmado
			300	No esta confirmado
			430	No esta confirmado

continuacion...

...continuacion

PROVINCIA	POBLACIONES DE LOS PROYECTOS CON FECHA DE ENTREGA			
	antes de 7/89	entre 8/89 y 12/89	a partir de 1/90	OBSERVACIONES
AZUAY: Cuadro 1:		360		
	204			
			1500	
		604		
	450			
	150			
	600			
	210			
	300			
			366	
			402	
			330	
AZUAY: Cuadro 2:			1250	
			536	
			616	
IMBABURO: Cuadro 1:	193			
	360			
	330			
		242		
		360		
		806		
		322		
			294	
			237	
IMBABURO: Cuadro 2:			600	
			297	
			335	
TUNGURAHAU: Cuadro 1:	368			
		700		
		600		
			1180	
			1000	
			905	
			660	
TUNGURAHAU: Cuadro 2:			2790	
			1570	

continuacion...

PROVINCIA	POBLACIONES DE LOS PROYECTOS CON FECHA DE ENTREGA			
	antes de 7/89	entre 8/89 y 12/89	a partir de 1/90	OBSERVACIONES
COTOPAXI: Cuadro 1:			300	
			460	
			750	
			2490	
COTOPAXI: Cuadro 2:			740	
			530	
			2500	
CARCHI: Cuadro 1:			580	
			550	
			296	
CARCHI: Cuadro 2:			580	
			550	
			296	
			389	
			262	
			692	
TOTALES:				
POBLACIONES:	8814	5634	35603	
No. de proyectos:	20	10	52	
Poblacion promedio:	441	563	685	

11

[illegible]

[illegible]

[illegible]		[illegible]	[illegible]		[illegible] ENTREGA	[illegible]
[illegible]		[illegible]		[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	91-07	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]
		[illegible]		500	[illegible]	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]
		[illegible]		150	92-05	[illegible]
		[illegible]		2.200	91-00	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]
		[illegible]		100	92-12	[illegible]
		[illegible]		[illegible]	93-01	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	90-11	[illegible]
[illegible]		[illegible]		1.200	90-09	[illegible]
GUAYAS		[illegible]		[illegible]	[illegible]	[illegible]
		[illegible]		4.000	90-11	[illegible]
PICHINCHA		[illegible]	A.P.	250	90-05	[illegible]
		VILLA VEGA	[illegible]	[illegible]	90-11	[illegible]
		BARRIO CORAZON [illegible]	A.P.	500	90-10	[illegible]
		CHILLOGALLO	A.P.	500	90-11	[illegible]
		COOP GUAYLLA [illegible]	A.P.	1.100	91-06	[illegible]
		[illegible]-SAN [illegible]	A.P.	400	90-07	[illegible]
		SAN JOSE YARUQUI	A.P.	1.346	90-07	[illegible]
		BARRIO AMAZONAS [illegible]	A.P.	[illegible]	90-07	[illegible]
		EL [illegible]	A.P.	[illegible]	90-11	[illegible]
		STA. [illegible]	A.P.	770	90-08	[illegible]
		PIFO	A.P.	2.002	90-09	[illegible]
		CACHIPICHA	AP-LET	700	91-04	AID
		YARUQUI	A.P.	1.046	91-06	[illegible]
		[illegible]	A.P.	[illegible]	091-06	[illegible]
		COLUMBIA ALTA	A.P.	2.330	91-09	[illegible]
		LA CONCEPCION	AP-LET	1.200	91-10	[illegible]
		COOP. EL [illegible]	A.P.	500	91-06	
		EL [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		STA. ROSA [illegible]	A.P.	2.000	91-06	[illegible]
		[illegible]	LET	990	[illegible]	[illegible]
		[illegible]	AP-LET	1.700	92-06	AID
		LOS [illegible]	A.P.		92-06	
		COOP. [illegible]	A.P.		92-06	[illegible]
		[illegible] CENTRAL	[illegible]	570	92-07	[illegible]

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[illegible]
[illegible]

PROVINCIA	CANTON	LOCALIDAD	SISTEMA	POBLAC.	FECHA ENTREGA	FINANCIAMIENTO
[illegible]		[illegible]	A.P.		[illegible]	
		[illegible]	AP-LET	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	92-03	[illegible]
		[illegible]	A.P.	[illegible]	90-04	AID
		[illegible]	A.S.	[illegible]	90-0?	
		[illegible]	A.P.	[illegible]	90-04	
		[illegible]	A.P.	[illegible]	90-1?	[illegible]
		[illegible]	A.P.	1.?00	90-10	[illegible]
		[illegible]	A.P.	100	90-04	[illegible]
		SANTA [illegible]	A.P.	190	90-10	[illegible]
		[illegible]	AP-LET	[illegible]	90-04	IEOS
		[illegible]	AP-LET	[illegible]	90-03	IEOS
		[illegible]	A.P.	[illegible]	90-0?	IEOS
		[illegible]	AP-LET	1.?00	90-0?	AID
		SAN CRISTOBAL [illegible]	A.?	?10	90-0?	IEOS
		[illegible]	AP-LET	1.?10	91-0?	FONAGA
		SAN PEDRO [illegible]	A.P.	?90	91-06	AID
		[illegible]	AP-LET	400	91-02	AID
		EL ROSARIO AYMESA	A.P.	1.?00	92-03	IEOS
		SAN VICENTE DEL RILA	A.P.	1.?00	91-03	FONAGA
		LA MAGDALENA	A.P.	1.?95	92-01	FONAGA
		ALPAHUMA	A.P.	1.200	91-01	AID
		[illegible]	A.S.	1.?00	91-11	IEOS
MORONA S.	PALORA	NUEVA TARQUI	A.P.	200	91-02	FONAGA
		TUTINENTZA	A.P.	?00	90-12	IEOS
		S. J. TAICHA	A.P.	160	90-03	FONAGA
		WAWAIME	A.P.	1?0	90-07	IEOS
		CHIVIAZA	A.P.	325	90-1?	IEOS
		UTUM-ILUS	A.P.	1?0	90-12	IEOS
		SAN LUIS DE [illegible]	A.P.	200	91-07	FONAGA
		AGUA SANTA	A.P.	200	91-03	
		CUMANDA	A.P.	150	91-03	
		INDANZA	A.S.	??0	91-07	FONAGA
		BELEN	A.P.	450	90-07	IEOS
		HUAMBI	A.P.	1.014	91-07	FONAGA
		CAMBANACA	A.P.	??0	92-07	FONAGA
		REGIONAL [illegible]	A.P.	7.000	92-05	IEOS
		[illegible]	A.P.	200	92-01	FONAGA
		[illegible]	A.P.	?00	92-01	FONAGA
NAPO		LORETO	A.P.	?00	91-02	FONAGA
		[illegible] NAPO	A.P.	1.??0	90-0?	FONAGA
		SAN LUIS	A.P.	1?0	91	MUNICIPIO [illegible]
		[illegible]	A.P.	?.000	90-1?	FONAGA
		[illegible]	A.P.	1?0	90-10	AID
		SAN [illegible]	LET	100	9?	IEOS
		[illegible]	LET	1?0	91-10	IEOS

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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MANAGUA	[illegible]	[illegible]	A.P.	[illegible]	91-10	
	[illegible]	[illegible]	A.P.		91-07	
	[illegible]	[illegible]	A.P.	[illegible]	[illegible]	
	[illegible]	[illegible]	A.P.	[illegible]	[illegible]	
	[illegible]	[illegible]	A.P.	[illegible]	88-01	
	[illegible]	[illegible]	A.P.	[illegible]	90-02	
	[illegible]	[illegible]	A.P.	[illegible]	92-03	
	[illegible]	[illegible]	A.P.	[illegible]	90-12	
	[illegible]	[illegible]	A.P.	[illegible]	90-05	
	[illegible]	[illegible]	A.P.	[illegible]	90-10	
	[illegible]	[illegible]	A.P.	[illegible]	90-11	
	[illegible]	[illegible]	A.P.	[illegible]	[illegible]	
	[illegible]	[illegible]	AP-LOT	[illegible]	90-05	
	[illegible]	[illegible]	A.P.	[illegible]	90-12	
MASAYA	[illegible]	[illegible]	A.P.	[illegible]	90-01	[illegible]
	[illegible]	[illegible]	AP-LOT	[illegible]	90-03	[illegible]
	[illegible]	[illegible]	A.P.	[illegible]	91-10	[illegible]
	[illegible]	[illegible]	A.P.	[illegible]	91-07	[illegible]
	[illegible]	[illegible]	A.G.	[illegible]	91-03	[illegible]
	[illegible]	[illegible]	A.G.	[illegible]	90-05	[illegible]
	[illegible]	[illegible]	A.G.	[illegible]	90-04	[illegible]
	[illegible]	[illegible]	A.P.	[illegible]	91-07	[illegible]
	[illegible]	[illegible]	A.P.	[illegible]	91-10	[illegible]
	[illegible]	[illegible]	A.P.	[illegible]	92-08	[illegible]
EL CRO	[illegible]	[illegible]	A.G.		91-11	
	[illegible]	[illegible]	A.P.	[illegible]	90-06	
	[illegible]	[illegible]	A.P.	1300	91-06	
	[illegible]	[illegible]	A.P.	[illegible]	90-06	

1993-febrero-10

PROYECTOS ENTREGADOS DESDE 1990 CON OTROS FINANCIAMIENTOS

Calculacion por Ing. A. Karp, en base de los datos proveidos por IEOS

PROVINCIA	POBLACIONES DE LOS PROYECTOS	
CARCHI	420	
	1280	
	900	
	560	
	3000	
	1500	
	300	
	200	
	750	
	300	
	480	
	200	
	600	
	2000	
	1000	
	4000	
	500	
	1000	
Sub-total:		18990
No. de sistemas:	18	
Pob. promedio:	1055	
COTOPAXI	1800	
	400	
	1100	
	400	
	900	
	600	
	550	
	150	
	620	
Sub-total:		6520
No. de sistemas:	9	
Pob. promedio:	724	
TUNGURAHUA	3000	
	150	
	100	
Sub-total:		3250
No. de sistemas:	3	
Pob. promedio:	1083	

PROVINCIA	POBLACIONES DE LOS PROYECTOS	
PICHINCHA	250	
	375	
	600	
	500	
	1165	
	400	
	1346	
	2540	
	300	
	770	
	2582	
	1346	
	1120	
	2360	
	1200	
	620	
	1200	
	2000	
	990	
	1100	est.
	1100	est.
	675	
	1100	est.
	1450	
	2580	
	535	
	625	
	1200	
	400	
	195	
	630	
	352	
	234	
	810	
	1510	
	1500	
	1600	
	1953	
	1500	
Sub-total:		42713
No. de sistemas:	39	
Pob. promedio:	1095	

continuacion...

...continuacion

	POBLACIONES DE LOS PROYECTOS	
EL ORO	850 est.	
	970	
	1300	
	275	
Sub-total:		3395
No. de sistemas:	4	
Pob. promedio:	849	
CHIMBORAZO	2073	
	200	
	640	
	300	
	2755	
	60	
	750	
	300	
	4235	
	675	
Sub-total:		11988
No. de sistemas:	10	
Pob. promedio:	1199	
AZUAY	Nos faltan datos para el Azuay. Por lo tanto, vamos a presumir que el numero de proyectos y la poblacion promedio en el Azuay son iguales a los promedios y las otras 7 provincias.	
Sub-total:		13221
No. de sistemas:	13	
Pob. promedio:	1017	

	POBLACIONES DE LOS PROYECTOS	
IMBABURA	900	
	435	
	800	
	2000	
	1000	
	200	
	1000	
	600	
	230	
	600	
Sub-total:		7765
No. de sistemas:	10	
Pob. promedio:	777	

****
* *
* POBLACION TOTAL: 107842 aprox. *
* No. de sistemas: 106 aprox. *
* Pob. promedio: 1017 aprox. *
* *
****

PHOTO NO. 5: This photo shows a member of the evaluation team interviewing members of the community water board (JAAP) in the community of Chambaponga, in the province of Cotopaxi. The evaluation team visited eleven communities such as this, where IEOS has constructed water systems and latrines, in order to see first-hand how the facilities were working, to learn what the communities thought of them, and to find out how well the water boards (JAAPs), the operators, and the hygiene education promoters were handling their responsibilities.

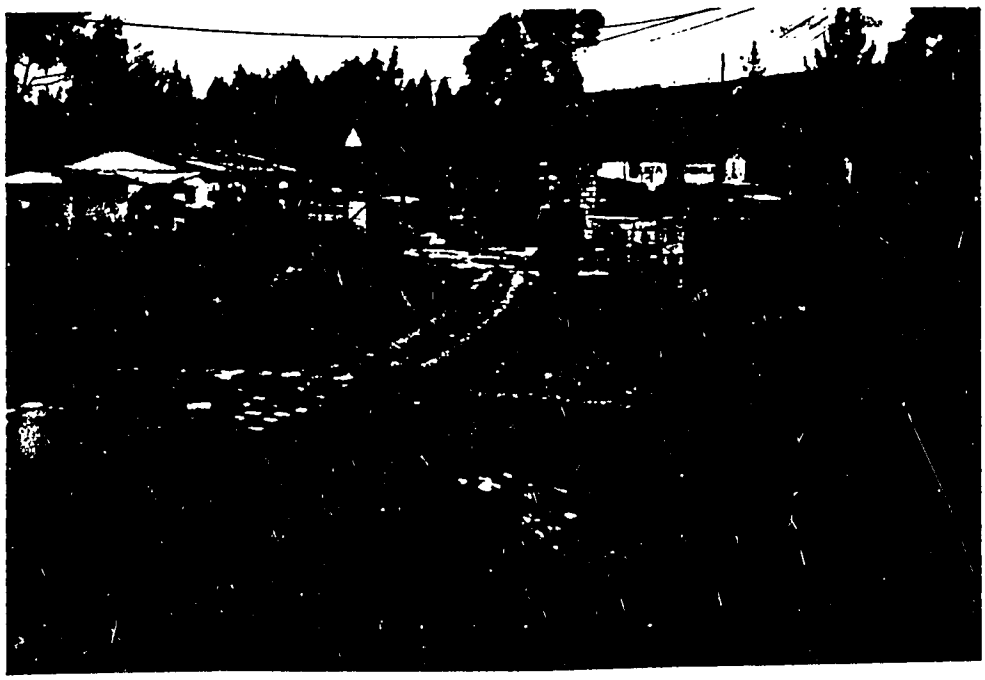

PHOTO NO. 6: This concrete-block factory is an example of the micro-industries which sometimes are supplied with water by IEOS projects. Although the projects are not built with the intent of serving such micro-industries, this nonetheless frequently takes place.

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PHOTO NO. 7: This photo shows the operator and his assistant cleaning the surface of a "dynamic" water filter in the community of Chambapongo, in the province of Cotopaxi. The crude water comes from a very contaminated stream. The treatment plant consists of a de-sander, the dynamic filter, and chlorination. In spite of its sophistication, the operation and maintenance of this plant has been adequate, with the exception of the chlorination facility, which occasionally is not used because of a shortage of money to pay for chlorine. This system provides water to two communities, with a total population of about 1,600 persons.

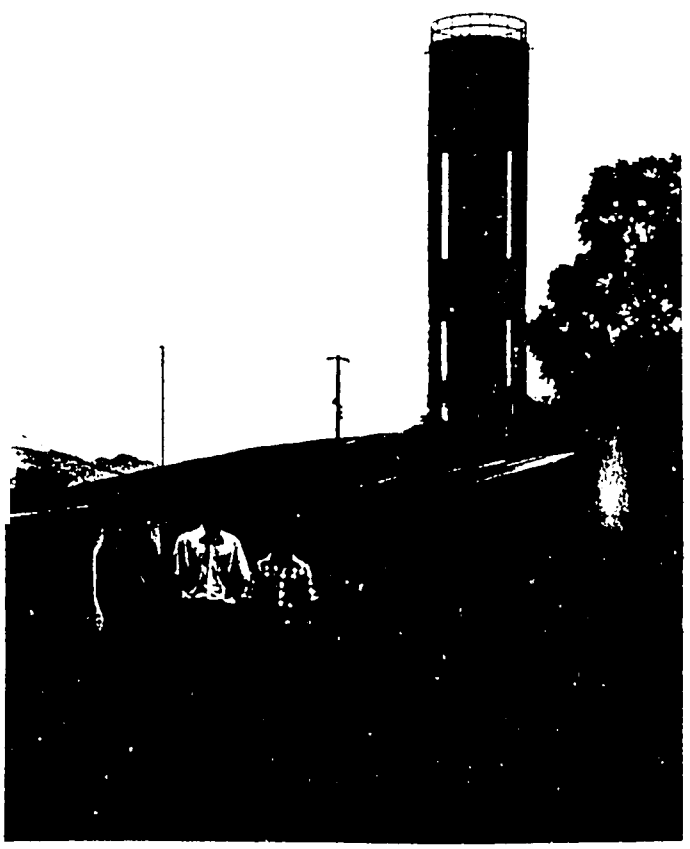

PHOTO NO. 8:
This photo shows an elevated water storage tank which is part of a "regional" system built by IEOS in 1986, in the parish of El Retiro, in the coastal province of El Oro. The tank is part of an electrical pumped system which provides water to four communities. The system functions very well, and the municipality pays the salary of the operator and the cost of the electricity for the pump. This is the only one of the communities visited by the evaluation team where the municipality contributes so much towards O&M.

PHOTO NO. 9:
In this photo an operator is opening the small tank which contains a strong solution of chlorine, which is utilized for adding chlorine to the main water storage tank. Most of the systems visited by the evaluation team had chlorination facilities similar to this, with some functioning well, and others experiencing problems.

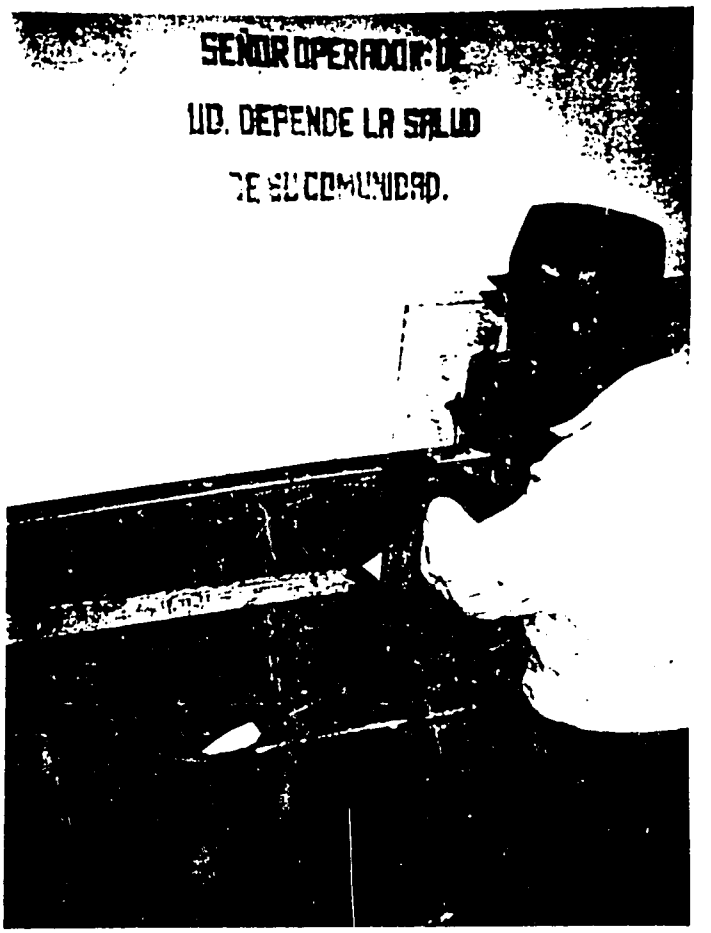

PHOTO NO. 10:
This operator is showing the equipment with the brand name "Clorid," which his community has purchased to locally manufacture sodium hypochlorite. The cost of this equipment was about US$ 300, and this investment results in a major savings in the cost of chlorinating the water supply. In the past year, several communities in the province of Azuay have purchased this type of equipment, which a private company manufactures in the provincial capital, Cuenca.

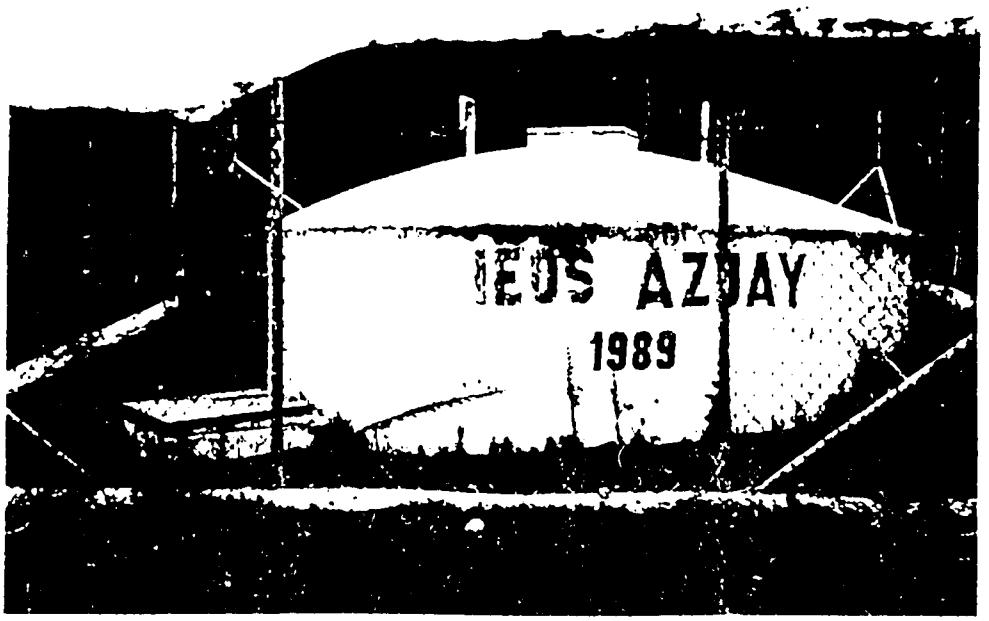

PHOTO NO. 11: This photo shows a water storage tank made of ferro-cement. This is an "appropriate" technology which has lowered the cost of such tanks by about 40 percent. IEOS has utilized this technology in many projects, but not everywhere. However, use of such tanks was a local initiative at the provincial level, without any prompting from the Appropriate Technology component of IEOS. Such local initiatives should be encouraged, and their results should be shared with those in other areas of the country.

PHOTO NO. 12:
In the photo an operator is pointing to a water meter, in the community of Chambapongo, in the province of Cotopaxi. It is a standard policy of IEOS to install meters in all household connections, in order to make it possible to set user-fees on the basis of the quantity of water used, and to avoid the excessive and uncontrolled use of the water.

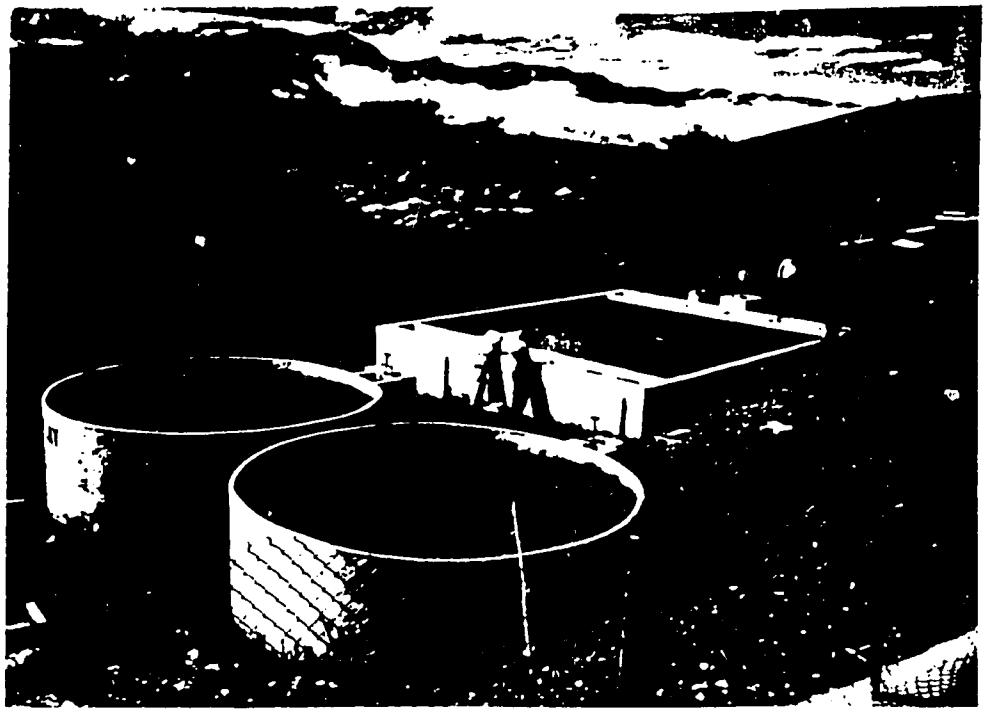

PHOTO NO. 13: This photo shows a fairly sophisticated water treatment plant, in the community of Tugula, in the province of Azuay. The plant consists of a pre-filter (in the rectangular construction in the photo), slow sand filtration (in the two circular constructions), and chlorination. In spite of its sophistication, this system functions well, as a result of the payment of adequate user-fees, a full-time trained operator, and a responsible and capable community water board (JAAP).

PHOTO NO. 14: This aerator is part of the water treatment plant in the community of Llimpe, in the province of Tungurahua. The aerator is needed as part of a treatment system which removes an excessive concentration of iron from the water. The treatment plant is sophisticated, with aeration, sedimentation, slow sand filtration, and chlorination. O&M is surprisingly good, with the only part of the system which is not adequately operated and maintained being the chlorination facility, because there is a lack of funds to pay for chlorine, and therefore the chlorination is intermittent.