WATER AND SANITATION FOR HEALTH PROJECT

COORDINATION AND INFORMATION CENTER

Operated by The CDM Associates
Sponsored by the U. S. Agency for International Development

1611 N. Kent Street, Room 1002
Arlington, Virginia 22209 USA

Telephone: (703) 243-8200
Telex No. WUI 64552
Cable Address WASHAID

INSTITUTIONAL DEVELOPMENT FOR IEOS: INSTITUTO ECUATORIANO DE OBRAS SANITARIAS

MARCH 1981
FIELD REPORT NO. 12

Contract No. AID/DSPE-C-0080

Project No. 931-1176

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

WATER AND SANITATION FOR HEALTH PROJECT

COORDINATION AND INFORMATION CENTER

Operated by The CDM Associates
Sponsored by the U. S. Agency for International Development

1611 N. Kent Street, Room 1002
Arlington, Virginia 22209 USA

Telephone: (703) 243-8200
Telex No. WUI 64552
Cable Address WASHAID

File: T-14

March 17, 1981

Dr. Kenneth Farr
Health Officer
United States Agency for International Development
Quito, Ecuador

Dear Dr. Farr,

I take pleasure in forwarding to you herewith, for the WASH Project, copies of a report prepared by C.S. Pineo and Henry Van on the institutional development of IEOS. This study was prepared in consequence of the Mission's request of 7 November 1980 via State Department Cable Quito 07796. The WASH Project was authorized to perform this study by the Office of Health in the Development Support Bureau of AID through Order of Technical Direction No. 14, dated 11 December 1980. The report is based on the work of WASH consultants Pineo, Van, and Guillermo Orozco, who worked in Ecuador (for differing periods) in the interval 23 January 1981 through 20 February 1981.

The results of the study were left with you, at your request, in the form of draft sections of a Project Paper. This format has been continued in this report, but with the explicit understanding that these sections represent the text recommended by the consultants, and do not represent in any way the official policy of the Agency in either Washington or Quito.

If there are any questions about this report, we will be happy to try to answer them.

Yours sincerely,

Peter J. Kolsky

Peter J. Kolsky
for the WASH Project

PJK/RS

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

KD 3999

INSTITUTIONAL DEVELOPMENT FOR IEOS: INSTITUTO ECUATURIANO DE OBRAS SANITARIAS

Report

by

Charles S. Pineo and Henry Van
WASH Project Consultants

for

USAID, Ecuador

March 1981

TABLE OF CONTENTS

LIST OF FIGURES

Follows Page

LIST OF TABLES

IEOS RURAL WATER SUPPLY AND SANITATION PROGRAM

A. Analysis of IEOS Institutional Organization

In spite of all the efforts that the Government of Ecuador (GOE) has been conducting there still exists a considerable deficit with respect to water supply and excreta disposal facilities. This has dramatically affected the rural areas and the slum areas of large cities. To alleviate this the GOE established the National Development Council (CONADE) to plan and coordinate development activities. CONADE prepared a National Development Plan for 1980-1984 that was approved in March 1980. The Plan gives high priority to rural development. Its objective is to achieve better conditions with respect to hygiene and health in the urban and especially the rural areas.

The goals of the Plan for the rural population make 30% accessible to potable water. Thirty percent of the rural population will be served with excreta disposal. It is expected to carry out 400 projects comprised of basic rural sanitation systems (potable water, excreta disposal, etc.) in order to meet the above percentages. These systems will be implemented by using community participation. One of the Plan's highest priority programs is integrated rural development (IRD). This effort will identify seventeen area- specific IRD projects, covering a population of approximately 465,000, to be carried out in 1980-1984.

Institutional Organization

Environmental sanitation did not take an institutional structure in Ecuador until 1972, at which time the National Government legally extended the responsibilities of the IEOS, which was formed in 1965, giving it planning and normative powers at the National level. Previously, IEOS had had the responsibility of designing and building potable water and sewer systems only for urban areas. Finally in 1978, environmental sanitation in IEOS was formally structured to provide basic sanitation to the rural areas.

The IEOS is an organization which carries out its activities under the jurisdiction of the Ministry of Public Health, but with an autonomous administration. Its activities are guided by a Directing Council comprised of representatives of the following institutions: Ministry of Public Health whose representative is the president of the Council; Institute of Hydraulic Resources, Ministry of Finance, National Planning Committee, Ecuadorian Municipalities Associations.

The IEOS has five major operational Directorates (a) Planning, (b) Project Design, (c) Construction, (d) External Financing and (e) Operation and Maintenance. This organization was implemented in 1979. At present, the responsibilities of the three National Directorates (Projects, Constructions, and Operation and Maintenance) are assigned program responsibilities for activities in environmen-

tal sanitation, health establishment and sanitary works for both urban and rural areas. The result is that the responsibilities for rural water supply and sanitation activities are so dispersed into so many different departments, sections and sub-sections that a program specifically for water supply and sanitation projects in rural areas lacks a responsible focus point.

Responsibility for urban water supply projects are interwoven with those for rural water supply programs. Divisions which are primarily responsible for rural sanitation have subordinated departments and even sections which have urban responsibilities.

The interweaving of responsibilities for urban and rural programs often results in a higher priority being given to the urban projects, particularly in an organization where urban projects have been, for years, the principal concern of the institution.

Logistical support in the IEOS is deficient. Vehicles and other technical equipment are very limited. Equipment maintenance programs, especially in rural areas, are nonexistent. Maintenance has been primarily corrective than preventive.

The IEOS receives most of its budget from the government of Ecuador. The budget is allocated in a lump sum called at IEOS the "global budget." No one program has its definite budget. Allocations are awarded as needed. (See Annex A for a detailed analysis of the IEOS institutional organization.)

B. PROJECT PLAN

Annex B contains a list of bottlenecks which are preventing IEOS from achieving the progress needed to meet the goals GOE has set for itself in the 1980-1984 National and the Decade Plans. The annex also includes a brief description of the actions the Project and the GOE will undertake to break most of the bottlenecks listed.

One of the basic actions will be the establishment of a Rural Water Supply and Sanitation Coordination Unit, directly under the Executive Director and Sub-Director of IEOS to focus the RWS & S activities, now dispersed throughout the IEOS organization, into one cohesive program. The Project will provide a consultant (sanitary engineer) for 36 months to assist in establishing the Unit and in carrying out its functions. The GOE will staff the Unit with a Chief, a social-cultural anthropologist and a health educator. The Unit will have two Sub-Sections, each with a Head and will be expanded in the second Project year to include an assistant in each Sub-Section. The Unit and Sub-Sections will have a total of three secretaries and six drivers by the second year to drive the six vehicles which the Project will provide. AID may also furnish short term consultants to carry out the studies needed to establish assistance to programs for IEOS in (a) training needs; (b) a possible computer facility; (c) determining the feasibility of introducing an incentive plan; (d) for the investigation of the local manufacture of equipment for the RWS & S programs and development of techniques and methodologies needed by those programs. This would require approximately 20 man-months of consultant services from AID.

In addition, the Project will provide 29 man-months of technical assistance for implementing the recommendations that develop from the studies mentioned above. In addition to helping by means of the RWS & S Coordination Unit to focus the activities of IEOS on the RWS & S needs and strengthening its ability to meet those needs the Project will also strengthen the IEOS ability at the provincial level in the 3 IRD provinces to meet the IRD rural water supply and sanitation needs in those provinces. The Project input will be six 4-wheel drive pick-ups, three 3-ton trucks and eight motorcycles. The Project will also provide three 4-wheel drive vans for operation and maintenance brigades to be established in the 3 IRD Provinces to backstop the local water supply administrative committees as well as to provide for water meter and pump repairs and for vehicle maintenance.

The Project will also provide three small repair shops equipped to carry out the above repairs and maintenance. A short-term consultant will be provided by the Project to assist in setting up the O&M brigades and repair shops, ordering equipment and in establishing procedures for the brigades. This will require six man-months during the life of the Project.

The Project will supply operation and maintenance and spare parts for four years for the IEOS vehicles paid for under the Project

loan. The GOE contribution to the Project will consist of strengthening the provincial staff in the three IRD regions by the addition of a total of 17 professional and technical staff and nine drivers, also by adding three mechanics, three helpers and three drivers for the O&M brigade vans.

The Project will supply audio-visual equipment and training materials for strengthening training, promotion and health education activities at national and the three IRD province levels.

Engineering equipment, design and graphics material will be provided for four years for the three IRD province RWS & S programs.

Construction and studies funds will be provided by the Project for approximately 45 water supply projects in the three IRD provinces plus hand pumps and the cost of installing protected wells for the dispersed population not reached by the water supply systems.

The Project will also supply funds to assist in carrying out water supply studies in the remaining 17 provinces.

The cost of disseminating information about the need for installing sanitary water-seal latrines and for supplying materials for 15,000 basinette type latrines will be covered by the Project.

The above Project costs will be covered under the loan portion of the Project with an estimated cost of US$2,100,000.

The Project grant funds will cover (a) the investigation and technology transfer aspects of the Project; (b) technical assistance cooperation in developing task-oriented training modules; (c) developing the RWS & S coordination Unit and related tasks; (d) participant training for five people connected with the IEOS RWS & S programs. The grant contribution over the 4-year project period will amount to US$1,000,000.

The estimated cost of the additional 20 man-months of consultant technical assistance proposed for the Project is US$160,000, but might be provided by centrally funded sources.

The MOH/IEOS contribution to the Project will amount to US$980,000 at the present rate of sucres 28 = US$1.00 for the staff added to carry out the Project, plus an estimated US$1,350,000 as community-participation and municipal contribution for the projects to be built with Project assistance. Tabulated below is a recap of the contributions for the four years of the Project.

A.I.D. Loan Contribution	US$2,100,000
A.I.D. Grant Contribution	1,000,000
MOH/IEOS Contribution	2,330,000
TOTAL	US$5,430,000

This does not include possible financing for the suggested incentive plan or of the additional consultant technical assistance in

training, computers, development of the incentive plan, or investigation of local manufacturing capability.

The MOH/IEOS Contribution amounts to 53% of the total project cost minus the AID grant contribution, and 43% of the project cost including the grant fund.

ANNEX A

IEOS RURAL WATER SUPPLY AND SANITATION PROGRAM

INTRODUCTION

In spite of all the activities that the Government of Ecuador has been conducting there still exists a considerable deficit with respect to water supply and excreta disposal facilities in rural areas. This has dramatically hindered the development of the rural areas and the slum areas of large cities. The GOE has recently concentrated its efforts on strengthening Ecuador's democratic system and developing the institutional and planning framework for implementing more significant development programs particularly in rural areas. As a first step, a National Development Council (CONADE) was established to plan and coordinate GOE development activities. CONADE prepared a National Development Plan for 1980-1984 that was approved in March 1980. The Plan gives high priority of rural development and calls for a major expansion in programs that meet the basic human needs of the 60 percent of the Ecuadorian population that is poor.

OBJECTIVES

The fundamental objective of the Plan is to achieve better conditions with respect to hygiene and health in the urban and especially the rural areas. Specifically, the following are more defined objectives outlined by the Plan:

1. To improve the habitat and attempt to reach a better equilibrium of the ecosystems.

2. In order to guarantee a continuous and reliable source of potable water to the communities there will be a complete inventory of the country's surface and ground waters.

3. Water sources for human consumption will be protected from all sources of contamination.

4. To search for appropriate technology concerning the manufacturing of construction materials utilized in potable water and excreta disposal systems.

GOALS

The plan has established the following goals:

1. To increase the population served and with easy access to potable water and sanitary excreta disposal according to the figures below:

Accessible & Served Population
Potable Water & Excreta Disposal for 1984

	Accessible Population	Population Served
Potable Water		
Urban	90%	65%
Rural	30%	25%
Excreta Disposal		
Urban		80%
Rural		30%

2. To build and expand in urban areas 47 potable water systems as well as 74 sanitary and storm sewer systems.

3. To carry out 400 projects comprised of basic rural sanitation systems (potable water, excreta disposal, etc.) These systems will be constructed with community participation.

One of the Plan's highest priority programs is integrated rural development (IRD). The Plan identifies seventeen area-specific IRD projects, covering a population of approximately 465,000, to be carried out in 1980-84.

An Integrated Rural Development Secretariat (IRDS) and a complementary IRD fund were established in October 1980 to organize, supervise and evaluate the GOE's integrated rural development program. The Director of the IRDS was appointed in November 1980. Through the IRDS mechanism the GOE expects to develop and implement IRD projects that can eventually be replicated thoughout the country.

PLAN OF ACTION

Priority will be given to those rural communities which are considered within the integrated rural development program. As far as proposed organization, staffing and logistical support are concerned, there are no detailed plans.

Promotion and community participation will be conducted according to the law and regulations prescribed by the GOE publication titled "Recopilacion de Leyes y Reglamentos de Juntas Administradoras de Agua Potable en el Area Rural." The financing of the subprograms stipulated under the Plan will be handled by the following sources:

1. Development Bank

2. Local government contributions (provincial and municipal governments).

3. IEOS' own resources.

4. Community participation

5. External loans

The costs of the program are represented in Tables A-1 and A-2.

TABLE A-1
1980-1984 PLAN
POTABLE WATER EXPENDITURES
(Million Dollars-1979)*

Program	N° of Systems	1980	1981	1982	1983	1984	Total
New Systems	25	5.1	7.6	9.0	10.4	22.7	54.8
Expansions	22	1.1	2.7	2.1	3.1	10.8	19.8
Rural Projects	400	7.2	8.8	12.8	15.0	25.7	69.5
Pending Projects	___	11.7	5.4	12.1	1.5	---	30.7
TOTAL:	___	25.1	24.5	36.0	30.0	59.2	174.8

* Exchange rate used was S/ 28.00 per $ 1.00 US

TABLE A-2
1980-1984 PLAN
EXCRETA DISPOSAL EXPENDITURES
(Million Dollars-1979)*

Program	N° of Systems	1980	1981	1982	1983	1984	Total
Storm Sewer	9 (new)	2.13	4.29	7.30	8.73	15.42	37.87
Storm Sewer	1 (expansion)	0.05	0.06	0.09	0.10	0.11	0.41
San. Sewer	53 (new)	3.30	11.38	16.74	18.35	29.01	78.78
San. Sewer	11 (expansion)	0.44	2.05	2.42	2.84	4.74	12.49
Rural Proj.	400	4.49	5.39	11.30	13.70	27.85	62.73
Pending Projects		6.61	7.14	7.17	2.60	---	23.52
TOTAL:		17.02	30.31	45.02	46.32	77.13	215.80

* Exchange rate used was S/ 28.00 per $ 1.00 US

INSTITUTIONAL ORGANIZATION

Environmental sanitation did not take an institutional structure in Ecuador until 1972, at which time the National Government legally extended the responsibilities of the IEOS, which was formed in 1965, giving it planning and normative powers at the National level. Previously IEOS had had the repsonsibility of designing and building potable water and sewer systems only for urban areas. In 1978, finally, environmental sanitation in IEOS was formally structured to provide basic sanitation to the rural areas.

The present goverment of Ecuador (GOE), elected in August 1979 following almost a decade of dictatorial rule, is committed to major structural and social reforms to confront Ecuador's widespread poverty and its serious rural development problems. The GOE has concentrated its intitial efforts on strengthening Ecuador's democratic system and developing the institutional and planning framework for implementing more significant development programs. As a first step, a National Development Council (CONADE) was established to plan and coordinate GOE development activities. CONADE prepared a National Development Plan for 1980-1984 that was approved in March 1980. The Plan gives high priority to rural development and calls for a major expansion in programs that meet the basic human needs of the sixty percent of the Ecuadorean population that is poor and that has been neglected by the country's economic growth process.

The IEOS is an organization which carries out its activities under the jurisdiction of the Ministry of Public Health, but with an autonomous administration. Its activities are guided by a Directing Council comprised of representatives of the following institutions: Ministry of Public Health whose representative is the president of the Council; Institute of Hydraulic Resources, Ministry of Finance, National Planning Committee, Ecuadorian Municipalities Associations.

The IEOS has five major operational Directorates (a) Planning, (b) Project Design, (c) Construction, (d) External Financing and (e) Operation and Maintenance. This organization was implemented in 1979. (See Figure A-2 for the IEOS organization chart.)

Planning has the responsibility, at the National level, for formulating and evaluating urban and rural plans and programs concerning potable water supply, excreta, solid waste wastewater disposal as well as for health centers. This Directorate has four divisions (Programming, Coordination, Technology and Evaluation) which are involved in the planning process. The Project Design Directorate is responsible for the preparation of all the designs corresponding to those projects assigned by the Planning Directorate. The Construction Directorate is tasked with constructing the small projects and usually contracting the large ones of the IEOS programs. The External Financing Directorate is concerned with processing financing outside the IEOS (national and international financial agencies). The Operation and Maintenance Directorate provides country-wide technical assistance for all the systems built by IEOS (see Figure A-1).

The IEOS has a provincial office in each of the twenty provinces. This office has three divisions (Environmental Sanitation, Sanitary Works, which involves work in urban areas, and Operation and Maintenance).

Figure A-2 depicts the Divisions, Department and Sections of IEOS in which the rural and urban sanitary responsibilities are located. Attention is drawn to the responsibilities of the three National Directorates (Projects, Construction and Operation and Maintenance). These Directorates are assigned program responsibilities for activities in environmental sanitation; health establishment and sanitary works for both urban and rural areas. The result is that the responsibilities for rural water supply and sanitation activities are so dispersed into so many different departments, sections and subsections that a program specifically for water supply and sanitation projects in rural areas lacks a responsible focus point.

Responsibility for urban water supply projects are interwoven with those for rural water supply programs. Divisions which are primarily responsible for rural sanitation have subordinated departments and even sections which have urban responsibilities.

The result is that any project for rural water supply and sanitation must follow a tortuous path from original inception to final installation and use by the beneficiaries, involving many disconnected units of IEOS.

The interweaving of responsibilities for urban and rural programs often results in a higher priority being given to the urban projects, particularly in the IEOS organization where urban projects have been, for years, the principal concern of the institution. For the 1980-1984 National and Decade Plans to be carried out with emphasis on the needs of the rural poor, IEOS philosophy must be broadened to give a higher priority to the needs of that large segment of Ecuadorian population.

Table A-3 (IEOS Existing Personnel 1981) lists the IEOS staff as of early 1981 in the National level Directorate and Divisions.

LOGISTICAL SUPPORT

Logistical support in the IEOS is deficient. First, vehicles are very limited and a large percentage of the ones that are being used are in poor operational condition. Technical personnel frequently have to cancel trips to the field due to the unavailability of transportation. Promoters generally have to travel long distances to the rural communities often carrying their equipment because of the lack of vehicles. These promoters travel by bus, bicycle, walk or even hitch-hike in order to get to their assigned communities or back to their provincial IEOS offices. Equipment is also limited.

TABLE A-3

IEOS - EXISTING PERSONNEL
OPERATIONAL DIRECTORATES/DIVISIONS
1981

DIRECTORATE	DIVISION	PERSONNEL	NUMBER
Planning		National Director	1
		Executive Secretary	1
		Assistant	1
	Programming	Chief 1, Civil Engineer	2
		Chief 2, Civil Eng/Architect	1
		Assistant Architect	6
	Coordination	Chief 1, Civil Engineer	1
	Technology	Chief 1, Civil Engineer	1
		Health Educator 10.C	1
		Health Educator 7a.C	2
		Health Promoter 1	1
		Health Promoter 3	2
		Draftsman 3	1
	Evaluation	Chief 2, Civil Engineer	1
		Civil Engineer 5	2
		Civil Engineer 4	1
		Assistant Engineer	1
		Assistant Architect	1
Project Design		National Director	1
		Secretary 4	1
	Rural Env. Sanitation	Chief 2, Civil Engineer	1
		Secretary 4	1
		Civil Engineer 5	3
		Civil Engineer 3	1
		Civil Engineer 2	2
		Civil Engineer 1	3
		Veterinarian Doctor	1
		Assistant Engineer	2
		Draftsman 3	2
	Urban Env. Sanitation	Civil Engineer 5	2
		Engineering Helper 2	1
		Civil Engineer 1	4
		Engineering Helper 3	1
	Urban Sanitary Works	Chief 2, Civil Engineer	1
		Chief 1, Civil Engineer	1
		Civil Engineer 5	1
		Civil Engineer 4	2

TABLE A-3 (Cont'd)

DIRECTORATE	DIVISION	PERSONNEL	NUMBER
		Civil Engineer 3	1
		Civil Engineer 2	3
		Sanitary Engineer 3	2
		Sanitary Engineer 2	1
		Sanitary Engineer 1	2
		Architect	1
		Surveyor 3	6
		Surveyor 2	1
		Assistant Engineer	6
		Assistant Architect	1
		Engineering Helper	4
		Draftsman 3	6
		Draftsman 2	1
		Secretary 1	2
Construction		National Director	1
		Office Chief 2	1
	Rural Env. Sanitation	Chief 2, Civil Engineer	1
		Chief 1, Civil Engineer	1
		Civil Engineer 5	1
		Secretary 4	1
	Urban Sanitary Works	Chief 2, Civil Engineer	1
		Civil Engineer 5	5
		Civil Engineer 2	1
		Supervisor	1
		Assistant Engineer	1
		Engineering Helper	1
		Secretary 4	1
	Installation	Chief 2, Maintenance Eng.	1
		Chief 1, Maintenance Eng.	1
		Chief 1, Civil Engineer	1
		Assistant Engineer	2
		Engineering Helper	1
		Mech. Engineering Helper	1
		Assistant Architect	1
		Maintenance Engineer 3	1
		Maintenance Engineer 2	1
		Maintenance Engineer 1	1
		Secretary 4	1
External Financing		Chief 2, Civil Engineer	1
		Chief 1, Civil Engineer	1
		Civil Engineer 2	2
		Architect 4	1

Table A-3 (Cont'd)

DIRECTORATE	DIVISION	PERSONNEL	NUMBER
		Architect 3	1
		Architect 1	1
		Assistant Engineer	1
		Financial Analyst 3	1
		Accountant 1	1
		Assistant Accountant 2	1
		Draftsman 3	1
		Draftsman 2	1
		Secretary	1
Operation & Maintenance		National Director	1
		Executive Secretary 1	1
	Rural Env. Sanitation	Chief 2, Civil Engineer	1
		Chief 1, Civil Engineer	1
	Urban Sanitary Works	Chief 2, Civil Engineer	1
		Chief 1, Civil Engineer	1
		Maintenance Engineer 4	4
		Shop Supervisor	1
		Surveyor 3	1
		Maintenance Technician	1
		Draftsman 3	1
		Secretary 3	1
		Helper	1
	Ground Water	Chief 2, Civil Engineer	1
		Chief 1, Civil Engineer	1
		Geology & Mining Eng. 2	2
		Geology Engineer	1
		Civil Engineer 4	1
		Sanitary Engineer 1	1
		Assistant Engineer 4	3
		Assistant Engineer 3	1
		Engineering Helper 3	2
		Secretary 4	1
	Laboratory	Chief of Laboratory	1
		Chemist 1	4
		Laboratory Technician 2	2
		Secretary 3	1
		Office Clerk 2	2

For example, surveying equipment has to be rented at the provincial level at high rates in order to perform topographic surveys. At the National level IEOS has only one set of surveying equipment. Audio-visual equipment for promoters to use in their presentations to the community is practically non-existent.

Maintenance of vehicles is very limited and often more corrective than preventive, leaving in many instances the personnel without vehicles simply because a corrective measure many times takes longer and is more costly causing considerable delays. In some cases provincial engineers have to personally repair their own vehicles simply because there is a lack of adequate personnel, facilities or even the economic resources to pay for the repairs.

BUDGET

The IEOS receives most of its budget from the Government of Ecuador. However, there are other sources such as international loan and aid agencies, national loan entities, and a percentage of the country's oil production revenues which contribute to its budget.

Every year the IEOS sends its proposed budget to the Ministry of Health (MOH) which in turn submits a combined budget to the House of Representatives. Based on the country's priorities and the available economic resources, the proposed budget is adjusted and sent back to the MOH. Here, the budget may be accepted or negotiated with the House. Once accepted by the MOH, the IEOS portions of this budget are allocated to the IEOS where the Directorate of Financing administers the different allocations.

Although the proposed budget is prepared at IEOS in great detail specifying the quantitites required for each program, when the budget is returned from the House of Representatives the budget is assigned in one lump sum rather than by program. Therefore, this amount is a "global budget" and is used as needed. This "global budget" concept began to be used in 1978. Because of this it is difficult to determine the amounts programed by program. Tables A-4, A-5, A-6 depict the 1977, 1978 and 1979 budgets corresponding to the sanitary works programs of IEOS. Since 1977 there has been a steady increase in expenditures related to basic rural sanitation, an average of about 90% expenditure of the money allocated per year. Moreover,the basic rural sanitation budget, in relation to that for construction of urban potable water and sewer systems, increased from 17% to 28% in 1978 and remained the same in 1979. The percents of the allocated funds utilized for 1977, 1978 and 1979 are 69%, 89% and 70%, respectively (an average of 76% per year during the above period).

TABLE A-4
IEOS 1977 BUDGET
SANITARY WORKS
(SUCRES)

PROGRAM	PROGRAMMED	ALLOCATED	SPENT	PERCENTAGE SPENT ALLOCATED
Sewer and Potable Water Studies	30,490,000	24,219,000	14,969,463	62
IDB Financed Constructions	289,782,176	244,183,000	233,768,695	96
Construction of Potable Water & Sewer Systems	586,315,400	412,260,000	370,143,050	90
Fluoridation	1,500,000	1,053,000	49,877	5
Systems Operation and Maintenance	4,500,000	3,159,000	1,822,726	58
Basic Rural Sanitation	99,325,000	68,816,000	51,736,544	75
Pollution Control	5,700,000	4,212,000	2,184,544	52
Solid Waste Disposal	37,480,000	34,378,000	32,250,716	94
Sanitation Control	2,200,000 *	2,106,000	---	--
Design & Construction of Health Establishments	324,148,460	258,614,000	249,871,970	97
New Health Establishments	41,000,000	---	---	--
TOTAL	1,422,441,436	1,053,000,000	956,797,587	91

*Operation Expenses only

The programmed budget for 1977 was S/.1,422,441,436. The amount spent was 67% of that programmed. The amount allocated was S/.1,053,000,000 or 74% of that programmed, of the amount allocated 91% was actually spent.

TABLE A-5
IEOS 1978 BUDGET
SANITARY WORKS
(SUCRES)

PROGRAM	ALLOCATED	SPENT	PERCENTAGE SPENT ALLOCATED
Sewer and Potable Water Studies	33,740,000	15,229,794	45
IDB Financed Constructions	146,000,000	142,471,745	98
Construction of Potable Water & Sewer Systems	357,654,754	283,339,838	79
Potable Water O&M and Fluoridation	4,129,000	6,417,208	155
Basic Rural Sanitation	100,500,000	107,790,701	107
Pollution Control	1,000,000	546,445	55
Solid Waste Disposal	14,217,000	11,791,514	83
Designs & Construction of Health Establishments	519,535,732	467,661,073	90
TOTAL	1,176,776,486	1,035,248,318	88

The allocated budget for 1978 was S/.1,176,776,486. The amount spent was 88% of that allocated.

TABLE A-6
IEOS 1979 BUDGET
SANITARY WORKS
(SUCRES)

PROGRAM	ALLOCATED	SPENT	PERCENTAGE SPENT ALLOCATED
Sewer and Potable Water Studies	32,842,116	16,437,620	50
IDB Financed Constructions	80,044,000	31,883,565	40
Construction of Potable Water & Sewer Systems	331,177,500	182,808,960	55
Systems Operation and Maintenance	7,200,000	10,101,010	140
Basic Rural Sanitation	91,973,090	83,200,017	90
Pollution Control	2,000,000	338,156	17
Solid Waste Disposal	8,000,000	6,130,851	77
Design & Construction of Health Establishments	369,196,116	327,970,364	89
TOTAL	922,432,822	713,870,553	77

The allocated budget for 1979 was S/.922,432,822. The amount spent was 77% of that allocated.

ANNEX B

RURAL POPULATION SERVED AND TO BE SERVED

WATER SUPPLY

During the period from 1970 to 1979 in Ecuador, the percentage of rural population with easy access to a satisfactory water supply increased from 2% to 10.3%[1]. (Different reports give different percentages of numbers of people served. The data for this report is taken from the reference document.) During that period an additional 350,000 people in rural areas were provided with water supply services, an average increase of about 40,000 per year. To reach the goal of 30% of the rural population to be served by 1984 (set in the 1980-84 National Development Plan) which means supplying service to a total of 1,350,000 by that date, will require that an additional 165,000 people in rural areas must be provided with water supply services per year, nearly a five-fold increase over the rate of services provided during the previous 9 years.

EXCRETA DISPOSAL

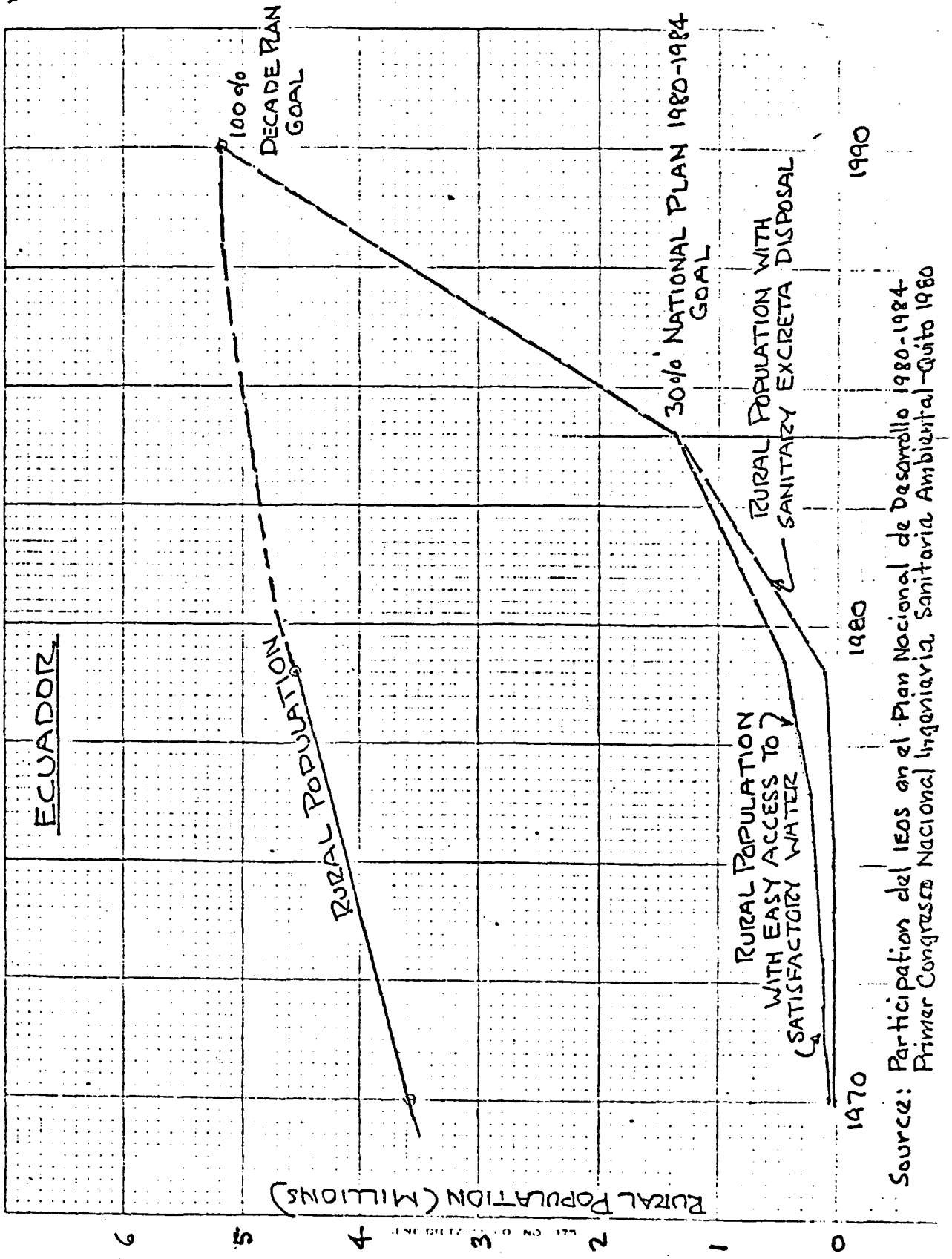
The provision of facilities for the sanitary disposition of human excreta provides an even darker picture. In 1970, 0.4% of the rural population had a sanitary means of excreta disposal (by latrines). This percentage had increase to 2.2% by 1979. In other words, during the period from 1970 to 1979 an additional 78,000 people had sanitary facilities for excreta disposal, an increase of about 9,000 people served per year. The National Plan calls for 30% of the rural population to have these services by 1980. This will require that 250,000 people in rural areas must be provided with sanitary excreta disposal facilities per year, namely a 28 fold increase in supplying these services during the 5 year period 1980-1984.

ACTION REQUIRED TO REACH GOALS

The above brief analysis does not take into consideration the increased effort required to meet the Decade Plan goals. Figure B-1 gives a graphic idea of the task to be accomplished to reach those goals.

1/ Participacion del IEOS en el Plan Nacional del Desarrollo 1980 1984 - Primer Congreso Nacional Ingenieria Sanitaria Ambiental - Quito 1980
RURAL POPULATION

1970	1975	1979	1984	1990
3,560,000	4,100,000	4,570,000	4,930,000	5,190,000



B-1 Target Population Projections For Rural Water Supply And Sanitation, 1970-1990

The analysis indicates clearly that something drastic must be done to make it possible to meet the immediate goals established for 1984, as well as those for 1990.

There are several obvious bottlenecks that must be broken including:

1. A lack of focus on the rural water supply and sanitation needs in the organization structure of IEOS. The responsibility for the various actions required to carry out projects for rural water supply and sanitation are divided among at least 6 different divisions of IEOS with no provision for coordinating the activities of those divisions. See Figure A-2 for the present IEOS organization.

2. A lack of trained personnel at both national and provincial levels. There are a number of vacancies for the positions indicated in Figure A-2 in addition to the lack of staff needed to carry out the National Plans.

3. The lack of a continuing training program designed to meet the job requirements of IEOS staff at the various levels.

4. The lack of transport which, restricts the effectiveness of staff at both national and provincial levels. This not only cuts down staff efficiency, but makes continuing supervision impossible.

5. The lack of computer facilities with the result that information cannot be analyzed rapidly, delaying, for months, the prompt action which might be required.

6. The low salary scale which makes it difficult to recruit and retain the experienced personnel required to carry out the extensive, technical programs of IEOS.

7. The emphasis in IEOS on the use of piped water supply systems with metered house connections and much less emphasis on the use of protected wells with hand pumps to meet the needs of the hundreds of thousands of rural poor living in small villages or dispersed areas.

8. The lack of a concerted, continuous program for the installation of sanitary latrines.

9. The low priority placed on continuing health and hygiene education.

10. The lack of in-country manufacturing of many of the materials required by the rural water supply and sanitation program, such as the water seal "bacinetes" which are imported from Colombia and which will be needed in the quanity of 235,000 to meet the 1984 goal; hand pumps; plastic well screen; faucets; water meters; etc.

11. Inadequate financing with long delays in allocation of funds which it has been estimated cuts a 12-month year to approximately 8 months of effective construction work.

12. Lack of adequate maintenance back-up facilities to assure continuous operation and maintenance of the existing water supply systems. This lack will become more serious as more systems are placed in service.

13. Inadequate provision for investigation of methodologies, techniques and equipment required for the carrying out of the proposed rural water supply and sanitation programs.

14. Although some manuals have been developed and are in use, others are needed to assure consistency of approach, methodology and techniques.

PROPOSED PROJECT ACTION

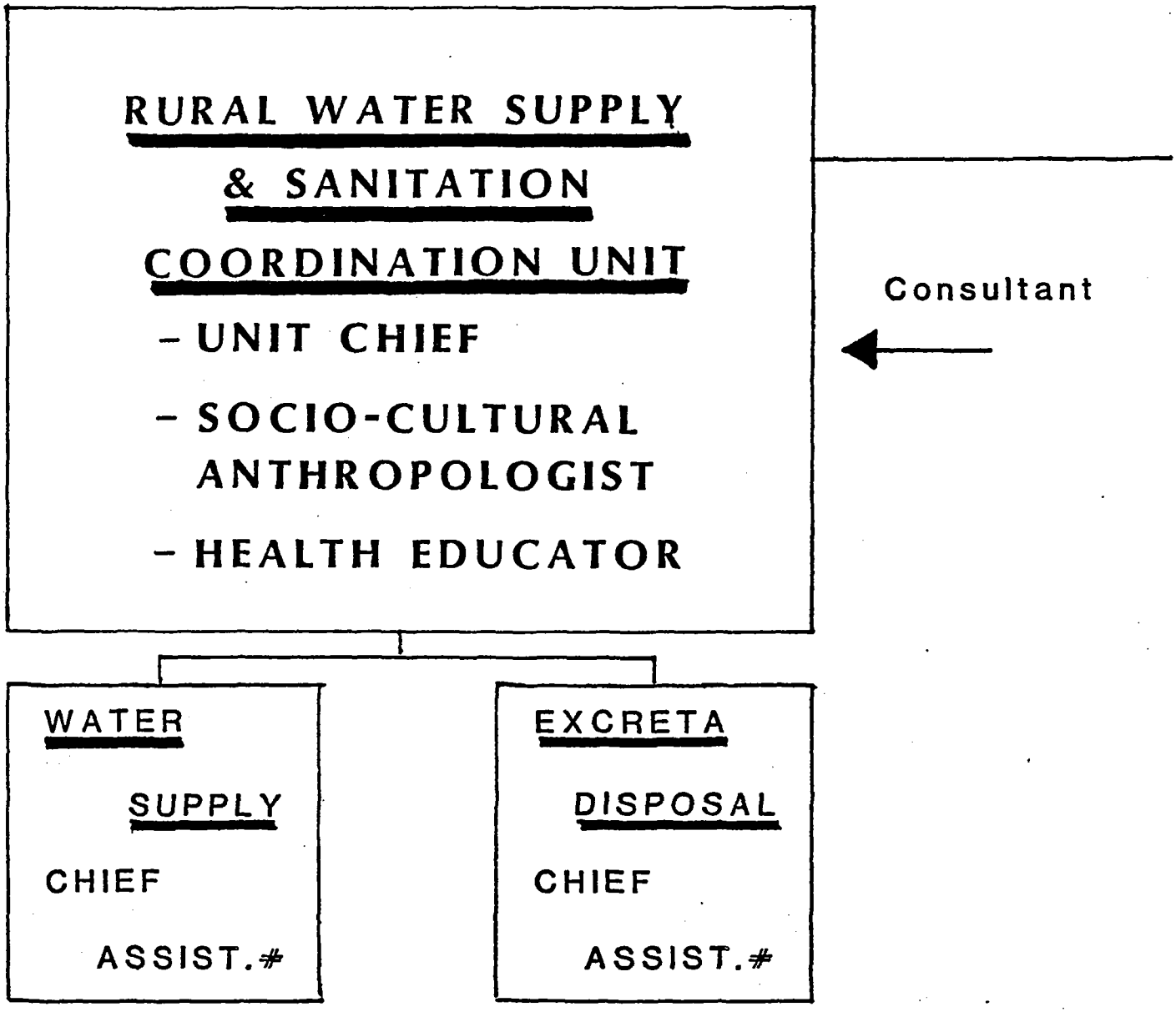
The present Project is designed to help remove most of the bottleneck listed above. The proposed action will be discussed in the same order used in listing the bottlenecks.

(The technical assistance to be furnished by the Project, as indicated in many of the items below may be furnished with Project financing or by centrally funded services. See the Technical Assistance Schedule Table B-2, for these services.)

1. One possible solution to the problem of lack of focus on the rural water supply and sanitaton program in IEOS would be to group together the various division and sections of IEOS which are involved in the rural water supply and sanitation activities of the agency. This would mean a complete disruption of the existing organization and of the philosophy upon which it is based.

   Rather than modify the present organizational structure, the proposed plan is to obtain the required focus and to assure the coordinated effort of the various divisions involved by establishing a Coordination Unit for Rural Water Supply and Sanitation Programs (see Figure B-2). (RWS & S Coordination Unit). The unit will be placed at a location on the IEOS organization chart where it can be most effective in coordinating and focusing IEOS rural water supply and sanitation activities, preferably connected to the vertical line below the executive and subdirectors, as shown on Figure A-2.

   This Unit would have a unit chief, a social-cultural anthropologist and a health educator, and would be provided with a Sub-Unit responsible for coordinating all activities of IEOS required for its rural water supply program, and a



#Second Year

Figure B-2 Proposed Coordination Unit For Rural Water Supply And Sanitation Programs

(See figure A-2 for location of this unit within IEOS)

second Sub-Unit responsible for the Sanitation (Excreta disposal) program. Each Sub-Unit will have a head and will be expanded in the second Project year to include an assistant.

In addition to coordinating the rural water supply and sanitation activities of IEOS, the RWS & S Coordination Unit will be responsible for coordinating (to the extent possible) the RWS & S activities of the other agencies - governmental and non-governmental - with those of IEOS to meet the 1984 and 1990 goals.

The RWS & S Coordination Unit will be staffed with two secretaries, in addition to the technical staff, and two four-wheel drive vehicles with drivers.

The Project will provide technical assistance to the RWS & S Coordination Unit for three years through the services of a sanitary engineer with 10 to 15 years experience in developing countries (preferably Latin America) in organizing and carrying out rural water supply and sanitation programs where the emphasis has been on simple technology, community participation and full awareness of the importance of an understanding of: (a) the customs and culture of the people to be served and (b) the need for continuing health and hygiene education to assure the health benefits for which the facilities are provided.

2&6. These two bottlenecks are considered together because they are directly interconnected. Many vacancies exist in the IEOS organization because it is difficult to attract and hold experienced personnel for the salaries which can be paid. Even the several fringe benefits which are paid in addition to the basic salaries fail to attract the type of staff required. The following is an indication of some of the fringe benefits (see Appendix I for a list of base salaries):

a. Income tax is charged only on base pay.

b. Every third month an extra month's salary is paid.

c. An extra representation allowance is paid monthly (from S/.5,000 to 12,000 depending on supervisory responsibility.)

d. Payment is made for longevity of service in IEOS directly in proportion to service time and indirectly proportional to salary.

e. An allowance of S/.100 per month is made for each child.

f. A savings plan is provided by IEOS against which employees may draw to pay specific types of bills such as home repair, etc.

It is going to be very difficult to break the salary bottlenecks. One possiblity is to establish an incentive plan such as has been used in the rural water supply program in Argentina. This plan would make it possible to attract the experienced personnel needed, and would have the advantage of speeding up work on projects to avoid long delays in completion of projects resulting in large cost overruns resulting from rising costs caused by inflation (see Ing. Orozco report, Appendix II).

Another way to fill vacancies at lower levels of responsibility is to attract less experienced people with the promise of intensive task-oriented training, followed by a period of in-service training and then closely supervised work in the assigned positions.

Technical assistance will be provided for studying the advantages in helping to establish an incentive plan adapted to the needs of the IEOS rural water supply and sanitation programs if considered advisable.

3. Now that the 1980-1984 National Development Plan is well underway, a detailed study should be made of the personnel needed to carry out the Plan and of the types of training required not only for the new staff but also refresher training for existing staff.

See Tables B-1(a), (b), and (c) for a list of personnel considered necessary to staff the Projected RWS & S Coordination Unit and to bring the provincial IEOS staff up to the strength needed to carry out the 1980-1984 and the Decade Plan goals.

The Project will provide technical assistance for studying the personnel needs and for developing appropriate training programs, also for assistance in developing a training center if deemed necessary.

In order to carry out the study of the personnel and training needs before the Project is signed, the technical assistance required for this purpose may be provided by centrally funded services as indicated in the Technical Assistance Schedule (Table B-2).

Training will be provided in-country for such personnel as sanitary inspectors, health educators, engineers, promoters, water supply system operators, administrative personnel and others needed for the RWS & S program. The numbers to be trained and the types and lengths of courses will be determined by the consultant, who is to study the personnel

needs of IEOS for the RWS & S program.

It is suggested that advantage be taken of the experience gained in developing the middle-level training program, by PAHO, in the Caribbean, under the guidance of Mr. Neil Carefoot assisted by Dr. John Austin.

TABLE B-1: INCREASE IN IEOS STAFF TO MEET GOALS

Through 1984
(In addition to present planned staff)

B-1(a) National RWS&S Coordination Staff

INCREASE REQUIRED	1981	1982	1983	1984
NATIONAL				
RWS & S Coordination Unit				
Unit Chief	1			
Sociocultural Anthropologist	1			
Health Educator	1			
W.S. Sub-Section				
Head	1			
Assistant		1		
Sanit. Sub-Section				
Head	1			
Assistant		1		
Secretaries	2	1		
Drivers	4	2		
Computer Section				
Computer Expert (if implemented)	1	1		
PROVINCIAL				
IRD/AID (3 Prov.) Staff x Province				
Envir. Eng	1 x 3			
Promoter	1 x 3	1	1	

TABLE B-1 (Cont'd)

B-1(b) Provincial IEOS Staff

INCREASE REQUIRED

	1981			1982			1983			1984		
IRD/AID (3 Prov.)	Staff	x	Province									
Topographer	1	x	3									
Chainman	2	x	3									
Draftsman	1	x	3									
Drivers		9										
3 Large Prov.												
Envir. Eng.	2	x	1	2	x	2						
Promoter	2	x	1	2	x	2						
Topographer	2	x	1	2	x	2						
Chainman	4	x	1	4	x	2						
Draftsman	2	x	1	2	x	2						
14 Provinces												
Envir. Eng.	1	x	4	1	x	5	1	x	5			
Promoter	1	x	4	1	x	5	1	x	5			
Topographer	1	x	4	1	x	5	1	x	5			
Chainman	2	x	4	2	x	5	2	x	5			
Draftsman	1	x	4	1	x	5	1	x	5			
Total 20 Prov.												
Envir. Eng.			9			9			5			
Promoter			9			9			5			
Topographer			9			9			5			
Chainman			18			18			10			
Draftsman			9			9			5			

B-1 (c) Operations and Maintenance Staff

Brigade

3 IRD Prov.

Mechanic	3
Helper	3
Driver	3

TABLE B-2: TECHNICAL ASSISTANCE SCHEDULE

MM	ADVISER FOR	1981	1982	1983	1984
36	RWS & S Coordination	FULL TIME			
12	Training	S* D*	I I	E	E
9	Computer Center	S* O	I	E	E
7	Incentive Plan	S* D I	E	E	E
6	Operation & Maint.	S&D&O	I	E	E
12	Investigations	S* D*	I* I*	E*	E*
3	Manuals	S&D	E		
85	(Man Months-Advisers)				

*Possible Assistance from centrally-funded sources

S = Study needs

I = Implement Program

E = Evaluation and Reorient, if necessary

D = Develop Program

O = Order Equipment

__ = Tentative Depending on Study Results

4. The Project will furnish a minimum of vehicles appropriate for the needs of the staff involved in carrying out the RWS & S Decade Plan who are restricted by lack of transportation in carrying out their responsibilities. See Table B-3 for a list of vehicles, which will be furnished by the Project, considered necessary for carrying out the 1980-1984 National Water Supply and Sanitation Plan.

5. The Project will provide technical assistance to study the requirements of IEOS for computer capacity and type to handle its varied data and technical needs. The study will lead to recommendations on the equipment requirements and the estimated cost of the installation of the recommended equipment. This will make it possible to seek financing for such an installation.

   In the meantime, the Project will finance a one year training program to prepare a person to head up the IEOS computer program. Other short term training will be financed to prepare the staff required to operate whatever equipment is recommended and installed, provided this is necessary during the life of the Project.

7. If the goals of the 1980-1984 National Plan and the Decade Plan are to be met, the sphere of action of IEOS needs to be extended to cover the multitude of rural poor who live in small groups, and as dispersed population which cannot be served economically by piped water supply with metered house connections.

   The RWS & S Coordination Unit will be responsible for reorienting the approach of the several divisions of IEOS responsible for carrying out the rural water supply and sanitation programs to assure that the programs reach these comparatively unassisted areas of the country. This may require the restructuring of some of the rural water supply divisions, or at least reorientation refresher training for some of the staff.

   It will also require reorientation of the provincial staff and the development of projects specifically for the installation of wells, both protected hand dug and drilled with hand pumps, and of sanitary latrines.

   It would be most beneficial if the sanitary inspectors could assist in the program of installing wells with hand pumps, and sanitary latrines, but it appears that their present work load and priorities make it unlikely that they will be able to assist with these programs. Advantage should be taken of the services of the sanitary inspectors when conditions permit.

TABLE B-3: VEHICLE REQUIREMENTS

RWS & S COORDINATION SECTION	1981	1982	1983
4 wheel drive	4	2	
3 IRD PROVINCES			
4 wheel drive pick-up	6		
175 c.c. motorcycles	6	1	1
3 ton trucks - 4 wheel dr.	3		
OPERATION & MAIN. PROV.			
Vans with maint. equip. 4 wheel drive	3		
MAINTENANCE SHOP			
3 IRD PROVINCES			
Small maintenance shop for routine maintenance of pumps, meters and vehicles	3		

The Peace Corps is another possible source of assistance for carrying out hand pump and latrine programs in the rural areas and also the Vozandes. The RWS & S Coordination Unit should investigate these and other possibilities for assistance and coordinate their efforts with those of IEOS staff.

Unfortunately, it has been impossible to estimate the number of hand pumps and wells which might be necessary to meet the needs of the rural population which cannot be economically served by piped systems. The sanitary survey now under way should provide an estimate of this need.

The sanitary engineer provided by the Project to work with the RWS & S Coordination Section will help IEOS in placing more emphasis on helping to provide these resources where they are needed. He will also help in coordinating the preparation of special projects for these areas.

8. The lack of a continuous program for the installation of sanitary latrines will be solved in part by the expansion of emphasis on provision of water supply and excreta disposal services for the small rural communities as mentioned in item 7 above.

It will be the responsibility of the RWS & S Coordination Unit to assure that sanitary latrines are installed in a community at the same time that the water supply system is installed. The two activities will be programmed to proceed simultaneously.

9. While it is true that every public health worker including the staff of IEOS has the responsibility of spreading an understanding of the principles of public health and hygiene in order to obtain the full health benefits of safe water supply and sanitary excreta disposal, a continuing health and hygiene education program is necessary. This should start well before any project activities are started and should be continued during the construction stages and until the villagers are fully aware of the health benefits of safe water and sanitary excreta disposal facilities, and how to use and maintain them.

Both IEOS and the Ministry of Health are responsible for providing this health education. Their efforts should be coordinated, again a function of the RWS & S Coordination Unit. Refresher training for IEOS staff should include emphasis on the various aspects of health education and how to provide it to the villagers.

Audio-visual material and equipment will be provided by the Project to assist in carrying the health education message

to the villages. Much material is available in the various latin American Countries, which may be adapted to the needs of Ecuador.

10. The stimulation of local manufacture of hand pumps is already under way in Ecuador, through an AID contract with Georgia Tech. Consideration is also being given to the local manufacture of plastic well screens, plastic faucets and possibly of a water metering device to replace the typical water meter.

An investigation will be made of the possibility of local manufacture of the bacinetes which are now imported from Colombia at an elevated cost. The production in Colombia cannot meet the demands of both Colombia and Ecuador so the bacinetes are always in short supply restricting the latrines programs in both countries. The establishment of a facility for manufacturing bacinetes in Ecuador would help to speed up the latrine program in Ecuador. The stimulation of the local manufacture of bacinetes in Ecuador will be undertaken under separate USAID assistance.

11. The financial bottleneck is one which cannot be faced by the present Project, except by assistance which the Project will provide toward stimulating the installation of adequate computer services and helping to train the staff required for those services. Efficient computer services would make it possible to utilize the scarce financial resources more efficiently.

A fringe benefit of the more efficient financial operations will be that international lending agencies will be attracted by this capability and hence more willing to provide the loans required to finance the Decade Plan programs for rural water supply and sanitation.

12. Although a discussion of the operation and maintenance bottleneck has been left until practically the last item, this does not mean that it is one of the least important. The opposite is true. No matter how efficiently a rural water supply and sanitation program may be carried out unless the facilities installed under the program are properly operated and maintained the money and effort involved in their installation has been wasted.

Even the simplest hand-pump needs maintenance or it is soon out of operation. A gravity system requires continuing attention and maintenance, and a system with pumps, treatment plants, and complicated chlorination equipment requires more complicated and expert operation and maintenance to provide the service for which it was designed and installed.

For less complicated rural systems, the general procedure is to turn the system over to the local Junta Administradora de agua Potable; to provide a minimum of training for the operator and then leave the system under the responsibility of the Junta. The Juntas in Ecuador are well organized and are operating the systems under their responsibility with care and concern. But from time to time a break-down occurs which requires attention beyond the Junta capacity. Assistance must be obtained from outside the community. Such assistance should be readily available so that the system can be repaired without delay.

The provision of this type of assistance requires the establishment of maintenance brigades at strategic locations throughout the country available to respond to calls for assistance. The ideal situation would be to provide for preventive maintenance based on regular inspection (monthly or bi-monthly) of each system. This is expensive for the number of systems now in operation, but should be provided for as the number of systems increases.

The Project will provide for the establishment of a maintenance brigade for each of the three IRD areas included in the USAID IRD program. The Project will provide technical assistance for establishing the brigade and training the required personnel, and the maintenance vehicle needed for each brigade. The three brigades will demonstrate the effectiveness of the back-stopping provided by these brigades for the Juntas in their respective areas. Studies will be carried out to evaluate the savings resulting from the ready availability of these back-stopping maintenance brigades. The brigades will be partially financed by the individual Juntas according to services rendered and material used.

In addition to being responsible for assisting in the maintenance of the rural water supply systems in its province, the maintenance brigade will also be responsible for the minor maintenance and repair required on the IEOS vehicles in the province. For maintenance purposes a small repair shop will be established by the Project as head quarters for the O&M maintenance brigade and also as a place to make minor repairs on water supply system equipment, including water meters; and to carry out the minor repairs and maintenance required for the vehicles. The project will provide the cost of operation and maintenance and spare parts for the vehicles paid for under the project for a period of 4 years.

It is expected that the results of the demonstrations in the three IRD areas will lead to the establishment of this type of service in other areas. The Operation and Maintenance division of IEOS has divided the country into three O&M regions (see Figure A-1). Plans should be developed

for establishing at least one O&M brigade in each of the three O&M regions in addition to the brigades to be installed in the IRD provinces.

13. The Project will furnish technical assistance to the appropriate Sub-Section of the Planning Directorate to assist in developing investigations which are needed to develop methodology, techniques, local production of equipment needed for the Decade Plan programs. One such project will be to investigate its effectiveness of the dynamic filter in producing potable water. Advantage will be taken of the several dynamic filters now installed in Ecuador for carrying out this investigation. Investigations will also be carried out on locally manufactured hand pumps, plastic valves, water-metering devices.

14. Technical assistance will be provided for the development, testing of needed manuals and training staff in their use. Manuals are urgently needed by the provincial engineers, promoters, health educators and maintenance brigades.

STRENGTHS OF THE IEOS PROGRAM

Although the many bottlenecks mentioned above may seem discouraging, most of them can be overcome as indicated with assistance of the present project.

Junta Administrativa de Agua Potable

The IEOS program has some strengths which many developing country programs lack. One of the most important of these is the strength of the Juntas Administradores de Agua Potable of which there are at present 131 in the country. These Juntas are legal entities with strict laws and regulations, which regulate their activities with respect to the operation, maintenance and collection of water consumption fees. The Juntas also are required to cooperate with the IEOS personnel in establishing and organizing health and hygiene education sessions better to prepare the community members of the use of potable water. The main objective of the Juntas is to effectively obtain the community participation.

Every Junta is comprised of five members (President, Secretary, Treasurer, and two alternates). These members are elected for a period of two years by popular vote. They can be reelected for a second term. Six different types of forms are used to record the information concerning the various types of activities (ranging from recording the money collection to purchasing orders.) The water consumption rates are established by the IEOS based on calculation of operation and maintenance cost.

Community Participation

Closely allied with the strength of the Juntas and the basis for

their success is the spirit of community participation which is inherent in most areas of Ecuador.

The custom of joining forces (known as MINGA in Ecuador) has been the backbone of community action for the common good of the rural village for centuries which makes it comparatively easy to organize a community for a cooperative water supply and sanitation project with full community participation. The person who cannot provide labor or material pays the equivalent of his share in the community effort.

This long history of community cooperation is probably one of the reasons why Ecuador has been able to obtain such a large percent of community contribution to the cost of its rural water supply and sanitation project. Table B-7 indicates that 18.12% of the investment in rural water supply systems from 1975-1978 was provided by the communties involved. Most of this was contribution in kind.

Community participation continues after the projects are completed, in caring for the projects and in paying for their operation and maintenance. This Minga spirit probably contributes to the fact that the majority of the rural systems constructed by IEOS are not only paying for operation and maintenance but also have a bank balance to provide for repairs and extensions.

Promotion and Promoters

Another element in the success of the IEOS rural water supply and sanitation program is the use of active promotion of the projects from before the time that construction is to be undertaken, through the construction phases and then continuing after the system is in operation. This includes assistance in setting up the Administrative Committee, training its members as well as the system operator and then periodic checking of the administration, operation and maintenance of the system. The promoter is the liaison between the provincial office of IEOS and the community.

Promotion is carried out not only by the promoter, but also by the Provincial Engineers. They also provide some health education, but their efforts are as a supplement to the major health and hygiene efforts of the the health educators of MOH and IEOS.

The promoter has a number of responsibilities such as to:

1. Motivate and instruct the communities on the benefits of safe water supply and sanitary excreta disposal.

2. Promote and help set up Water System Administration Committees.

3. Carry out socio-economic, sanitary and other types of surveys.

4. Give short courses on the various aspects of environmental

sanitation.

5. Help to organize community participation for the construction and maintenance of water supply and sanitation systems.

6. Act, when necessary, as assistant to the sanitary engineer.

The required qualifications for a beginning promoter are:

1. High school graduate with emphasis on education or the humanities.

2. A course in environmental sanitation and community development. Higher levels of promoters require some related experience and require additional duties.

TABLE B-4: FINANCIAL PLAN
MOH/IEOS/AID LOAN-GRANT
A.I.D. COOPERATIVE FUNDING UNDER LOAN

	U.S. DOLLARS
1. IEOS National level logistics in support of RWS & S Coordination Division (6 vehicles- 4 wheel drive)	60,000
2. IEOS Provincial level logistics. (6 pick-ups, 3 - 3 ton trucks, both with 4 wheel drive, 8 175 c.c. motorcylces) total for the 3 IRD provinces.	180,000
3. IEOS - 3 IRD Provinces - 3 - 4 wheel drive vans equipped for maintenance of systems.	60,000
4. IEOS - 3 IRD Provinces 3 work shops (total) for repair of pumps water-meters and motorized equipment used on IEOS Project in the 3 IRD Provinces.	70,000
5. IEOS-National level audio-visual equipment and training materials strengthening.	60,000
6. IEOS - 3 IRD Provinces audio-visual equipment training materials strengthening.	60,000
7. IEOS - 3 IRD Provinces engineering equpment, design and graphics material for 4 years.	40,000
8. IEOS-Operation and maintenance and spare parts fund for IEOS vehicles paid for under this loan for 4 years	70,000
9. IEOS - 3 IRD Provinces-construction and studies funds for about 45 projects over 4 years plus hand pumps and wells.	900,000
10. IEOS-National level studies fund for projects in the other 17 provinces.	200,000
11. IEOS Provincial level water-seal latrines fund for construction, dissemination of 15,000 water-seal latrines in the 3 IRD Provinces	400,000
A.I.D. Loan Contribution one 4 year project period	$2,100,000

TABLE B-5: FINANCIAL PLAN
MOH/IEOS/AID-LOAN-GRANT
A.I.D. COOPERATING FUNDING UNDER GRANT

	U.S. DOLLARS
1. Investigations and technology transfer of simple technologies, locally manufacturable in Ecuador and field pilot studies.	220,000
2. Technical assistance and cooperation in the development of task and performance oriented training modules and material for sanitary inspectors, health educators, engineers promoters, system operators, administrative personnel required for the RWS & S program, including curriculum development and assistance in training trainers.	210,000
3. General technical assistance and cooperation in establishing and developing the RWS & S Coordination Unit as well as in the areas of project planning, design, operation and maintenance, organizational management logistics management, computer technology (65 man. mo.) $8,000/mo.	520,000
4. Participant training for about 5 people (Masters level) in U.S. or appropriate facility in Latin America (sanitary/environmental health engineers, health educators, computer sciences) all with emphasis on the needs of developing water supply and sanitation programs for rural areas of Ecuador.	50,000
A.I.D. Grant contribution over 4 year project period	$1,000,000
Possible assistance from centrally funded sources for general technical assistance and cooperation (non-add) (20 man months)	$160,000

TABLE B-6: FINANCIAL PLAN
MOH/IEOS/AID-LOAN-GRANT
MOH/IEOS COOPERATIVE FUNDING UNDER LOAN

	U.S. DOLLARS
1. IEOS National level funding for increased manpower for RWS & S Coordination Division for 4 year project.	383,000
2. IEOS 3 IRD Province funding for increased manpower for provincial level water supply and sanitation activity for 4 year project.	454,000
3. IEOS 3 IRD Province funding for increased manpower for operation and maintenance brigades, 4 year project.	143,000
4. Community and muncipal participation for Project to be built with Project loan funds	1,350,000
MOH/IEOS loan contribution over 4 year project period.	2,330,000

MOH/IEOS contribution to loan is 53% of the total loan or 43% of the total loan plus grant.

TABLE B-7

APORTE COMUNAL CONSEGUIDO MEDIANTE LA PROMOCION Y EDUCACION SANITARIA EN LA EJECUCION DE OBRAS DE AGUA POTABLE RURAL ANOS 1975 - 1978 (1)

(SUCRES)

PROVINCIA	INVERSION ESTIMADA EN PROYEC. TERMIN.	APORTE COMUNAL	PORCENTAJE %
Carchi	21'699.808	4'870.320	22,44
Imbabura	6'954.000	664.640	9,56
Pichincha	32'480.000	4'330.080	13,4
Cotopaxi	7'550.000	4'076.560	53,9
Tungurahua	8'000.000	2'093.840	26,17
Chimborazo	3'960.500	1'764.480	44,56
Bolivar	8'250.000	1'677.920	20,34
Azuay	4'513.248	728.000	16,13
Loja	10'740.000	684.400	6,4
Esmeraldas	5'010.000	---	---
Manabi	9'569.249	56.000	0,6
Napo	1'100.000	235.000	21,4
Pastaza	1'000.000	30.000	3,0
Morona	1'850.000	870.000	47,0
Zamora	2'900.000	725.000	25,00
	125'576.841	22'803.240	18,16

(1) El aporte comunal para 1979 no se ha tomado en cuenta por no estar tabulada la participacion.

APPENDIX I
IEOS EMPLOYEE BASE SALARIES

1981 IEOS

EMPLOYEE BASE SALARIES

(In Sucres)

Position	Base Salary
Executive Director	S/.21,000
Assistant Director	17,500
Chief Auditor	15,900
Assistant Chief Auditor	13,000
Auditor 3	12,000
Auditor 2	11,100
Auditor 1	10,500
Director of Legal Council	15,900
Legal Council 4	12,700
Assistant Council	8,000
Chief Librarian	8,800
Library Technician	7,200
Provincial Chief 3	17,400
Provincial Chief 2	15,900
Provincial Chief 1	13,500
Civil Engineer 5	13,500
Civil Engineer 4	13,000
Civil Engineer 3	12,700
Civil Engineer 2	12,000
Civil Engineer 1	10,500
Architect 5	13,000
Architect 4	12,600
Architect 3	12,000
Architect 2	12,000
Architect 1	10,500
Assistant Architect	9,200

Position	Base Salary
Assistant Engineer	8,400
Engineering Helper 3	6,000
Directorate Director	17,400
Chief 2, Civil Engineer	15,900
Chief 1, Civil Engineer	14,700
Sanitary Engineer 3	12,500
Sanitary Engineer 2	12,000
Sanitary Engineer 1	10,500
Maintenance Engineer 5	13,500
Maintenance Engineer 4	13,000
Maintenance Engineer 3	12,500
Maintenance Engineer 2	12,000
Maintenance Engineer 1	10,500
Mining & Geological Engineer	12,000
Geological Engineer	10,500
Chief 2, Maintenance Engineer	15,900
Chief 1, Maintenance Engineer	14,700
Chemist 4	12,000
Chemist 1	8,400
Veterinarian Doctor 5	13,000
Health Educator 10.c	11,785
Health Educator 7a.c.	8,850
Health Educator 5a.c.	7,320
Promoter 3	8,800
Promoter 2	7,200
Promoter 1	6,000
Topographer 3	8,000
Topographer 2	7,200
Draftsman 3	6,000
Draftsman 2	5,400
Draftsman 1	4,800

Position	Base Salary
Maintenance Technician 5	8,400
Maintenance Technician 4	8,000
Maintenance Engineer Helper	8,400
Laboratory Technician 2	5,800
Chief of Budget	13,000
Finance Analyst 4	12,700
Finance Analyst 3	10,500
Finance Analyst 2	11,500
Finance Analyst 1	8,400
Accountant 3	7,200
Accountant 2	6,300
Accountant 1	5,800
Economist 2	11,500
General Accountant	13,000
Chief of Warehouse 3	10,500
Chief of Imports 2	8,000
Payroll Officer 3	8,000
Payroll Officer 2	6,600
Supply Officer 3	7,200
Reporter 3	12,000
Reporter 2	10,500
Administration Analyst 4	12,700
Administration Analyst 3	10,500
Administration Analyst 2	9,600
Executive Secretary 3	8,800
Executive Secretary 2	8,000
Executive Secretary 1	7,200
Secretary Typist 4	6,000
Secretary Typist 3	5,800

Position	Base Salary
Secretary Typist 2	5,200
Secretary Typist 1	4,700
Office Chief	6,900
Office Clerk 4	6,000
Office Clerk 3	5,200
Office Clerk 2	4,700

Note: In addition to the base salary the employees receive the following fringe benefits:

1. Four extra tax-free monthly salary payments spaced thoughout the year.
2. Any position with supervisory responsibility (from section level and up) will receive from S/.5,000 to 12,000 per month tax-free as representation expenses.
3. A seniority subsidy which is directly proportional to the salary and indirectly proportional to the years of service.
4. Family allowance of S/.100 per child/month.
5. Every month the IEOS will deposit a specified amount as a savings plan which can only be used for specific purposes such as remodeling of a home, emergency of any kind, etc.

SOURCE: IEOS Planning Directorate, 1981.

APPENDIX II
INCENTIVE PLAN FOR THE DEVELOPMENT OF A RURAL SANITATION PLAN

by

Guillermo Orozco

Quito, Ecuador
February 20, 1981

Translated by: H. Van

INCENTIVE PLAN FOR THE DEVELOPMENT OF A RURAL SANITATION PLAN

1. BACKGROUND

1.1 Rural Sanitation Programs Delays (Potable Water and Excreta Disposal)

Delays in the execution of rural sanitation programs are notorious and are observed in most Latin American countries, even in those whose projects have the financing assured and count on the corresponding local counterfinancing. This is due to multiple causes, one being the little or no administrative capability of the responsible organizational components which execute the programs as well as their personnel's lack of motivation. This occurs even when adequate norms and administrative procedures are available.

By means of an incentive plan it is proposed to fight against the above mentioned "bottlenecks" and allocate a remedy to these problems.

Unfortunately, the low salaries offered by the government organizations do not attract qualified professionals and technicians. This means that there is a great problem in obtaining the necessary personnel to develop and implement the programs; futhermore, even if it is possible to recruit qualified personnel, during the execution of their duties no great yield is obtained because there is no incentive for accomplishing a good job. This is due to the fact that personnel is conscious of their never economically improved situation regardless of the effort made. On the other hand, the lack of economic resources many times delays the progress of the programs at the implementation level, often because a spare part is lacking for the only vehicle available, or for example, the health promoter cannot go out to a specific community becaues economic funds are not available for travel expenses.

1.2 Rural Sanitation Programs Methodology (Potable Water and Excreta Disposal)

A special treatment is required for rural sanitation programs, substantially different from those of urban sanitation works. The rural programs have special social considerations which play a very important role in obtaining community participation. This does not occur in urban programs. In other words, one is not dealing only with construction of a physical facility but with a com-

munity mobilization process that will not only take part in the construction of a system but the administration of it after its completion.

To be able to better explain the so called "Incentive Plan" (Plan) it is important to describe the methodology used in Ecuador in developing rural sanitation projects. Thus, one will be able to understand better how the "Incentive Plan" contributes to the increasing production yield of the government implementing units in the area of rural sanitation programs (potable water and excreta disposal) used for the Ecuadorian provinces.

1.2.1 Preliminary List of Communities

The program implementation units of the IEOS (Ecuadorian Institute of Sanitary Works) Provincial Head Office, based on the knowledge it has of the various communities under its jurisdiction prepares a preliminary list of the communities in which it could be feasible to provide potable water and excreta disposal services. This list is discussed by the Provincial sanitary and political authorities who define and determine the priorities. Once these are determined the list is then submitted to the IEOS Central Office who in turn analyzes this list. After the list is approved it is returned to the Provincial Office to continue its development process.

1.2.2 Pre-feasibility Study

Based on the approved list and its priorities, the provincial engineer will visit the community and perform an assessment of the possible sources of water, technically and economically verify the water supply and determine the feasiblity of the proposed system.

1.2.3 Socio-economic Study

Simultaneously with the feasibility study, or immediately following it, the IEOS health promoter conducts the socio-economic study. This study provides general information about the community, especially its attitude toward the possibility of establishing potable water and excreta disposal service. A construction unit cost is obtained from the pre-feasibility study. The community's capability to pay such cost as well as their attitude toward the future service is obtained from the socio-economic study. These two factors will determine if the project should go forward or be cancelled. The cancellation of a project is based on (1) the unit cost being higher than that established in the Rural Sanitation National Plan, or

(2) if the community for some reason does not wish to participate in the project. The cancellation many times is temporary since often these two factors are recitified with time.

1.2.4 Topograhic Survey

If the community meets all the requirements, then a topographic survey is performed and the necessary detailed data for the construction is gathered.

1.2.5 Definite Project

Based on the topographic survey, the hydrologic data and information obtained during the socio-economic study, a definite project is designed based on the IEOS design specifications. This definite design and construction plan is then submitted to the IEOS at the central level.

1.2.6 Promotion and Community Organization

Simultaneously, with the elaboration of the project design and construction plan the community participation organization is initiated. Also the future community participation is viewed at this time. The result is the formation of an Administrative Committee (Junta Administradora) which becomes legal by means of a signed agreement with the IEOS (IEOS - Community).

1.2.7 System Construction

During this phase, the promotion process will cooperate intensively with engineering in obtaining the adequate utilization of the community's labor force. Also, promotion will include community health education activities so the community will be capable of optimally utilizing the potable water and excreta disposal system in order to obtain a healthy change of habits. The project is considered completed when the IEOS, by means of a legal document, offically delivers the system to the community's Administrative Committee.

1.2.8 Supervision of the Administrative Committee

Once the system is already being administered by the Administrative Committee, the IEOS Provincial Head Office is responsible for supervising such administration. This is done by performing periodic checks, usually done quarterly. The results of the inspection are logged on special forms designed by the central government and established by law.

2. INCENTIVE PLAN

2.1 Description of the Incentive Plan

In order to correct the various "bottlenecks" described in paragraph 1.1 and which are responsible for the IEOS Provincial Head office's low production yield, the Incentive Plan proposes to aid in overcoming the administrative-type obstacles which are encountered. Also it creates a stimulus for personnel to produce more and with better quality. By overcoming these obstacles and obtaining a better yield from the personnel, government agencies can save money. However, to accomplish this, additional money is required.

The additional money required is assigned to two areas: a) to complement operational expenses of the implementing provincial units; and b) to establish a determined amount to be paid as an extra salary or bonus to all personnel at the provincial level. The first is especially needed during the last months of the fiscal year when the budgeted amounts have been practically depleted. In this way the lack of a specific element will not be an excuse for the program not to proceed as scheduled. Frequently, it occurs that just because of the lack of a few dollars the necessary items needed for the completion of the project are not obtained or the travel money cannot be obtained for the engineer to go out and supervise the construction.

In order for the Incentive Plan to yield maximum results the following are required: a) for the IEOS to have an adequate organization with effective administrative procedures and good strict supervision; b) for the personnel at the central level to provide the efficient cooperation required during project review and approval process, and to expedite the delivery of the required materials in the province.

2.2 Schedule of Activities

In paragraph 1.2 the sequence of activities during construction was described. Each one of these steps terminates in a specific event which is easily identified. The required supervision which must be provided to operating systems is also known.

The complexity of the various activities varies considerably. Some are simple and relatively easy to accomplish and others are more complicated requiring a greater effort. This necessitates establishment of an index of accomplishment for each one of these activities. Experience by IEOS has determined that one engineer can simultaneously supervise the construction of three (3) potable

water and excreta disposal systems. The same load can be assigned to the promoter.

2.2.1 Goals and Index of Accomplishment

The programming goals and corresponding indices of accomplishment, as an example, could be:

	Description of Goals	Index of Accomplishment
1.	Project Feasibility o Will be completed when the preliminary report is approved.	5
2.	Socio-economic Study o Its completion is considered when the study is analyzed and approved by the corresponding authorities at the Central Level.	5
3.	Topographic Survey o This goal is accomplished when the drawings are delivered and approved at the Central Level.	10
4.	Definite Project o This goal will be accomplished when the proposed designed project has been approved by the Central Level.	20
5.	Organization of the Administrative Committee o This goal will be completed when the legal document of possession is awarded to the Committee.	3
6.	Signature of the IEOS - Community Agreement o The legal signature of this document accomplishes this goal.	2
7.	Initiation of Construction o This goal is accomplished when the Chief Provincial Engineer has sent a telegram notifying commencement of construction.	10
8.	Completion of Construction o Presentation of the legal IEOS document to the community stating delivery of the completed and operational system is sufficient proof that this goal has been accomplished.	35

9.	Operational Supervision of System o Submission of the IEOS operation inspection report accomplishes this goal.	10

It is understood that meeting the above requirements as proof of accomplishing each goal means that the specific task has been carried out adequately according with IEOS specifications.

2.2.2 Time Required for Each Activity

Most of the water supply and excreta disposal systems built by IEOS in the rural areas have been built in 3 or 4 times longer than the period originally programmed.

According to the opinion of IEOS personnel working in this area during the last four years and given the conditions which would be created by the Incentive Plan those projects that up to now have been built in 12 to 18 months could be built in 6 months. The activity during these 6 months would be broken down as follows:

	ACTIVITY	TIME REQUIRED
1.	Pre-feasibility Report	1 week
2.	Socio-economic Study	2 weeks
3.	Topographic Survey	3 weeks
4.	Project Design	4 weeks
5.	Administrative Committee Organization Simultaneous to the above activities, the time required to accomplish this task is estimated to take 3 weeks.	
6.	Signature of the IEOS-Community Agreement The specific time required for this task is estimated to take 1 week. This task is carried out simultaneously to those indicated under items 1 to 4.	
7.	System Construction	16 weeks
	TOTAL	26 weeks

2.2.3 Provincial Programming

In mutual agreement between the central and provincial levels and keeping in mind factors such as the National Rural Sanitation Plan, the assigned provincial human and economic resources and the time required for each activity the work schedule is prepared. This schedule would specify which of the ac-

tivities listed under paragraph 2.2.1 would be performed during the year and which ones would be performed every three months.

The bonus assigned to the provincial personnel would be determined as follows: the number of times that each activity is to be conducted is multiplied by the index of accomplishment. The products are added. The total obtained will determine the value of the bonus established for each provincial level. If the predetermined total is not reached, the bonus will be proportional to the number of points reached. The distribution of this total amount will be made to the personnel in proportion to their salaries.

2.2.4 Semi-annual Evaluation

Since the partial goals are semi-annual the evaluation will be conducted during this period.

2.2.5 Regulations

A set of regulations will be prepared. These will outline in detail the entire mechanism for the Incentive Plan, the manner in which the evaluation is to be conducted and the penalties to be imposed at all provincial levels in case false information is submitted. Also, included will be all the forms for reporting activities and pertinent data.

3. ADVANTAGES AND DISADVANTAGES OF THE PLAN

As anything else the proposed Incentive Plan has its advantages and disadvantages over existing conditions. However, the balance of these in other places where the Plan has been applied has been definitely positive.

The fundamental objective is to obtain a greater yield out of the implementing units of government. This is done by offering an incentive or bonus to the personnel. In other words, personnel are being rewarded for their extra effort to reach a proposed goal.

If the personnel receive an increase in straight salary equivalent to the amount of the proposed incentive bonus given for accomplished goals the effect upon production would not be the same. This is because the personnel would not link such an increased salary to increased performance, and the individual employee sees no reason to make an extra effort to improve his yield.

In order for the provincial personnel not to present any excuses and not to accomplish their tasks on time, it is convenient to

have available economic funds in the budget for administrative expenses. This would provide the provincial level with support to be able to accomplish their tasks.

3.1 Advantages

3.1.1 Funds for Administration and Construction of Projects.

As stated previously, completion of rural projects by IEOS to date has taken 12 to 18 months. According to IEOS professionals working in this area during the last four years, and given the conditions which would be created by the Incentive Plan, those projects that up to now have been built in 12 to 18 months could be built in only 6 months. This reduction of the construction time would mean a great savings, not only in the administration of the projects but in their cost. This in reality would minimize the impact of inflation.

3.1.2 Establishment of Rational Programming.

The establishment of reasonable goals will require a careful programming of the activities. This in the future will help to determine the real operational capability of the provincial level.

3.1.3 Assistance to Improve the Administration.

By continuously exercising programming and evaluation the implementing units will be required to maintain good administrative procedures. These will allow personnel to easily obtain information at the right time and have efficient control.

3.1.4 Provides Prestige to the Institution.

The ability to complete the programs on time and adequately accomplish the programmed goals gives a good professional image to the institution, not only before the aid institutions but other government agencies and what is more important, before the international loan institutions.

3.1.5 Training of Personnel.

The development of this Plan constitutes a type of on-the-job training in administration and programming for the IEOS personnel working in rural sanitation programs.

3.2 Disadvantages.

Some of the disadvantages of the Plan are:

3.2.1 Creation of Resentment in other Government Institutions.

Personnel in those provinces in which the Plan is implemented will feel privileged and this may originate envy in others which are not benefiting from such Plan.

3.2.2 Cancellation of the Plan would Create Low Morale Among Those Who Participated in it.

It will be logical to suppose that personnel once working under the Plan will become used to it. Thus, its cancellation would awaken an even lower morale than before, therefore causing productivity to fall lower than before.

3.3 Economic Savings of the Plan.

As it was stated previously, the economic benefits which could be obtained by implementing the Plan would favorably affect two areas: a) the administration and b) construction of projects. In the first one, by saving time the financial savings will be reflected in salary savings and in the second because the impact of inflation is minimized.

3.3.1 Calculation of Economic Savings by Province.

To make an analysis of the possible costs the following conditions will be considered: a) average time taken to date for the development and construction of a rural water supply system is 15 months, b) the applied rate of inflation is 12% and c) the provincial personnel salaries used for comparison purposes would be:

Personnel	Total Annual Salaries
1 Provincial Engineer	$ 9,857
1 Civil Engineer	7,428
2 Promoters	10,058
1 Topographer	4,571
2 Chainmen	4,572
2 Draftsmen	6,856
1 Secretary	3,428
1 Payroll Officer	3,771
TOTAL	US $50,541

Monthly Salary Cost: 50,541 ÷ 12= US$4,210.

The provincial level would be capable of conducting all the activities with their existing personnel. It is important to remember that one engineer can simultaneously supervise the construction of three (3) water supply and excreta disposal systems in three different communities.

3.3.2 Investment and Administrative Expenses Without the Incentive Plan.

Suppose that the selected communities have an average population of 800. The per capita cost is US $100. Therefore, the total budget would be US $80,000. The provincial level can build simultaneously three systems in a period of 15 months. The annual rate of inflation is estimated at 12%.

Based on the above, the necessary budget would be as follows:

- o System Investment
  3 systems x US $80,000 each = $240,000
- o Inflation Due to 9 Months of Delay at the End of Construction
  $240,000 x 0.12 x 9/12 = 21,600
- o Personnel Cost
  $4,211 monthly cost x 15 months 63,165

TOTAL US $324,765

3.3.3 Investment and Administrative Expenses With the Incentive Plan.

It is suggested that 40% of the payroll value be designated to pay the personnel incentive or bonus. Twenty-five percent (25%) of this amount will aid in paying the administration expenses.

Taking the three above mentioned systems with an investment of US$240,000 and having an incentive plan the projects would be completed in 6 months. Therefore, the required budget would be:

- o System Investment

  3 systems x $80,000 each = $240,000
- o Personnel Cost

  $4,211 monthly cost x 6 months = $ 25,266
- o Subsidy for the Incentive Plan

40% of $25,260 = $ 10,106

- o Adjustment for Administrative Expenses (30% of the Incentive Plan subsidy)

  0.30 x $10,106 = $ 3,031

TOTAL US $278,403

3.3.4 Savings of the Project

- o Cost of the 3 systems without Incentive Plan US $324,765
- o Cost of the 3 systems with the Incentive Plan US $278,403

SAVINGS $ 46,362

- o Savings per Systems

  $46,362 ÷ 3 = $15,454 or 14% of the Project's cost per system.

APPENDIX III
CONSULTANT FIELD CORRESPONDENCE

Feb. 19, 1981

MEMORANDUM

TO: Dr. Ken Farr, Chief Health Office

FROM: Charles S. Pineo and Henry Van

SUBJECT: Report on Reorganization of IEOS to Facilitate the Implementation of its Rural Water Supply and Sanitation Program

In accordance with my terms of reference from WASH/AID dated January 22, 1981 and those of Dr. Henry Van dated January 23, 1981, I arrived in Quito, Ecuador on January 23rd and he arrived on January 27th.

We held daily discussions with various representatives of IEOS at both the national and provincial level. The principal contacts were with Arch. Rodrigo Moreno, Director, National Planning Directorate of IEOS and with Eng. Manuel Aldas of the Programming Department of that Directorate, who was assigned as our counterpart.

Three meetings were held with Eng. Carlos Ordoñez, Executive Director of IEOS, the first a protocol visit, the second to report progress on our studies and the third to present our recommendations for AID assistance to strengthen the IEOS organization to meet the 1980-1984 National and Decade Plan goals. Eng. Ordoñez definitely endorsed the recommendations; even made suggestions which strengthened them. Those meetings were attended by Dr. Ken Farr who participated in the discussions (the first meetings were arranged by Dr. Farr).

The discussions at the national level were supplemented by a visit to the IRD area in Cotopaxi where conversations were held with the IEOS provincial engineer, the promoter, the doctor in charge of the Health Center in Salcedo, followed by a meeting with the Water Supply Administrative Committee of Pilacumbi, one of the many such committees in Ecuador which are operating their water supply systems in the black with a balance in the bank (Pilacumbi has a balance of 17,000 sucres). Ecuador is to be congratulated on the efficiency with which those committees are functioning. It is realized that observation of only one committee is not a fair sample, but the visit confirmed reports which have been studied.

The attached interim report has been developed on the basis of the above discussions and has been reviewed in detail with Dr. Farr and those at IEOS who have helped us develop the report. It is divided into four parts, two for the body of the PP summarizing the observations and recommendations which are detailed in the two parts prepared as annexes. The final report will be completed in Washington within thirty days according to my terms of reference. However, I see no reason why it should take that long, in fact I expect to complete my contribution to the report before the end of February.

We have been fortunate in obtaining the assistance of Eng. Orozco who only recently left Ecuador after 6 years as a PAHO consultant. He arrived in Quito on February 16th and we will leave on February 20th.

Because Eng. Orozco helped develop and implement the incentive plan which was so effective in speeding up the rural water supply and sanitation plan in Argentina, I have asked him to indicate the advantages of adapting the plan to help IEOS reach the ambitious goals set by the 1980-1984 National and Decade Plans.

The incentive plan has several advantages, including making it possible to attract and retain the experienced personnel required for the rural water supply and sanitation program who cannot be attracted by existing salary scales; helping to assure that projects are carried out as scheduled avoiding the long delays in completion of construction which are frequent at present. Such delays are expensive in these days of double digit inflation and should be avoided if possible.

It is hoped that AID will be willing to consider financing an incentive plan for at least one year as a demonstration to IEOS of the benefits of the plan in carrying out its rural water supply and sanitation programs, with the objective of IEOS financing the plan for future years. Argentina found the incentive plan so effective that it financed the costs of the plan with its own resources.

A copy of Eng. Orozco's report is attached. The possibility of using an incentive plan for IEOS programs is considered in my report with provision for studing its applicability and, if considered feasible, assisting in installing and implementing an incentive plan.

Attached to my report is a copy of the notes taken by Dr. Van during the many discussions we have held with representatives of IEOS. These notes are not intended to form a part of the report but to leave in the files material for others who may be involved in the program in the future.

Attached also is a copy of a letter written to Eng. Ordoñez thanking him and the members of IEOS for their full cooperation with us in developing our report.

We also want to express our appreciation for the support you and the Mission have given us during our assignment in Ecuador. We hope that our joint efforts will lead to a cooperative USAID-IEOS program which will bring improved water supply and sanitation facilities to the many people in rural areas who lack these essential services.

It should be noted that Dr. Van worked 3 Saturdays and 3 Sundays, namely Jan. 31, Feb. 1,7,8,14 and 15, also the holiday on Feb. 16th. I worked 2 Saturdays and 2 Sundays, namely Feb. 7,8,14,15 and the holiday on Feb. 16th.

UNITED STATES AID MISSION TO ECUADOR
INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
QUITO, ECUADOR

Quito, Febrero 18 de 1981

Señor Ingeniero
Carlos Ordoñez
Director Ejecutivo
I.E.O.S. - Instituto Ecuatoriano
de Obras Sanitarias
Toledo 684 y Lérida
Ciudad

Estimado Ingeniero Ordoñez:

Deseamos el Doctor Henry Van y un servidor agradecer a usted y a su personal, tanto a nivel nacional como en el provincial, la gran cooperación y amabilidad que nos han brindado.

Estamos particularmente muy agradecidos por la oportunidad que usted nos ha brindado de colaborar personalmente con sus servidores, de intercambiar ideas y por sus muy valiosas y bien recibidas sugerencias las cuales hemos incorporado en nuestro reporte a la A.I.D. Agradecemos infinitamente la cooperación del Arquitecto Moreno y el Ingeniero Aldás quienes han invertido gran parte de su valioso tiempo en desarrollar las sugerencias que se propondrán con el propósito de fortalecer el program de abastecimiento de agua y saneamiento rural del I.E.O.S.

Esperamos que estas sugerencias sean aceptadas por la USAID/Quito y posteriormente se incorporen a su propuesto proyecto.

Permítanos agradecer a usted una vez más por su asistencia y esperamos que los resultados de nuestro mutuo esfuerzo hagan posible el alcanzar las metas fijadas por el Ecuador para 1980-1984 y el decenio.

Sin otro particular, reiteramos nuestro más sincero agradecimiento.

Atentamente,

Ing. Charles Pineo

Dr. Henry Van

INTERNATIONAL MAIL ADDRESS:
U.S. AID Mission to Ecuador
c/o American Embassy
Quito - Ecuador

U.S. MAIL ADDRESS:
USAID - Quito:
Agency for International Development
Washington, D.C. 20523
OR
USAID/Quito, APO MIAMI 34039

CABLE ADDRESS: USAID QUITO
Phones: 521211 - 521100 - 521771 - 521413