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DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

EL SALVADOR

PROJECT PAPER

RURAL WATER SUPPLY AND SANITATION

AID/LAC/DR:79-20

Project Number 519-0209

UNCLASSIFIED



AGENCY FOR INTERNATIONAL DEVELOPMENT
UNITED STATES OF AMERICA A. I. D. MISSION
TO EL SALVADOR
C/O AMERICAN EMBASSY
SAN SALVADOR, EL SALVADOR, C. A.

PROJECT AUTHORIZATION

Name of Country: EL SALVADOR Name of Project: Rural Water Supply
and Sanitation

Number of Project: 519 - 0209

1. Pursuant to Section 104 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Rural Water Supply and Sanitation Project for El Salvador, involving planned obligation of not to exceed \$480,000 in grant funds over a three year period from date of authorization, subject to availability of funds in accordance with A.I.D. OYB/allotment process, and subject to the mutual approval of the parties to the agreement, at the time of a subsequent increment, to proceed, to help in financing foreign exchange and local currency costs for the project.
2. The project consists of activities designed to improve the ability of the MOH Bureau of Health Engineering and Rural Water Supply Department (DAR) to adequately maintain its rural water supply systems and to meet the present and future demands for installation of water systems. The project emphasizes decentralization of many DAR activities away from San Salvador to the regional offices by improving the technical capacity of regional and individual community personnel. Its design supports development of a fully integrated approach to rural water supply, including effective and meaningful community participation, installation of latrines, health education, and a balanced program of preventive and corrective maintenance.
3. The Project Agreement which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegation of Authority shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

4. a. Goods and services, except for ocean shipping, financed by A.I.D. under the project shall have their source and origin in the Central American Common Market or in the United States except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the project shall, except as A.I.D. may otherwise agree in writing, be financed on flag vessels of the United States, or the Central American Common Market.

b. Prior to any disbursement, or the issuance of any commitment documents under the Project Agreement, the Cooperating Country shall furnish in form and substance satisfactory to A.I.D.:

- a statement of the name of the person holding or acting in the office of the Grantee and of any additional representatives, together with a specimen signature of each person specified in such statement;

- evidence that the Ministry of Health has assigned eight (8) vehicles, two to each of the four health regions, for use in implementation and general backstopping of the project;

- documentation that an inter-ministerial agreement has been concluded between the Ministries of Health and Education regarding the use of facilities and instructors of ITCA (Instituto Tecnológico Centroamericano) for training for 15 CPARs (Constructor/Promotor en Acueductos Rurales) under Component III.

c. Prior to additional disbursement after January 15, 1981, the Grantee will furnish to A.I.D. in form and substance satisfactory to A.I.D. a policy statement and accompanying time phased plan to accomplish the following:

- The upgrading of 15 rural water promoter positions to the level of CPAR, with accompanying salary increases, for those rural water promoters who successfully complete the CPAR training program;

- relocation of four electrical technicians and their crews from San Salvador to each region with accompanying salary increases, upon completion of their operation and maintenance training program;

- replacement of the 15 rural water promoters who will become CPARs;

- the earmarking of necessary funds (\$80,000) to repair ten (10) rural water systems under Component II.

3/4

d. The Cooperating Country shall covenant to establish, in agreement with A.I.D., an evaluation program as part of the Project. The program will include, during the implementation of the Project and at one or more points thereafter:

- evaluation of progress toward attainment of the objectives of the Project;
- identification and evaluation of problem areas of constraints which may inhibit such attainment;
- assessment of how such information may be used to help overcome such problems; and
- evaluation, to the degree feasible, of the overall development impact of the Project.

The Grantee will submit to A.I.D. an evaluation plan within 90 days of the signature of the Project Agreement.

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7

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LIST OF ACRONYMS

ANDA	National Administration of Water Supply and Drainage
CIDA	Canadian International Development Agency
CPARs	Mid-Level Rural Sanitation Constructor/Promoters (Constructor/Promotores de Acueductos Rurales)
DAR	Rural Water Supply Department (Departamento de Acueductos Rurales)
ECS	National Health Training School (Escuela de Capacitación Sanitaria)
GOES	Government of El Salvador
IDB	Inter-American Development Bank
INCAP	Nutrition Institute for Central America and Panama (Instituto de Nutrición de Centroamérica y Panamá)
ITCA	Technical Institute for Central America (Instituto Técnico de Centroamérica)
MOH	Ministry of Health and Social Assistance
PAHO	Pan American Health Organization
UNDP	United Nations Development Program

TABLE OF CONTENTS

	Page
I. PROJECT SUMMARY AND RECOMMENDATIONS	1
A. Recommendations	1
B. Introduction and Summary Description	1
1. The Problem	1
2. Summary Description	2
II. PROJECT BACKGROUND AND DESCRIPTION	4
A. Project Goal and Purpose	4
1. Project Goal	4
2. Project Purpose	4
3. Project Relationship to the CDSS and Health Sector	4
B. Background	5
1. Synopsis of MOH Rural Water Supply Program	6
2. Rural Water Supply Program Institutional Deficiencies	7
a. Inadequate Maintenance Capability	7
b. Lack of Meaningful Community Participation	8
c. Lack of Capacity for Project Preparation and Installation	9
d. Lack of Diversity in Technology Choice	9
C. Detailed Description of Project	9
Component I: Operation and Maintenance Survey and Design of DAR Maintenance	10
1. Operation and Maintenance Survey	10
2. Survey Analysis	11
3. Design of Maintenance Program	11
Component II: Operation and Maintenance Training	12
Component III: Training Program for Mid-Level Rural Sanitation Constructor/Promoters of CPARs	13
Component IV: Appropriate Technology Design	14
D. Project Relationships to GOES and Other Donor Priorities	15
1. Ministry of Health	15
2. Inter-American Development Bank	16
3. CIDA	16
4. UNDP/UNICEF	16
5. Coordination with AID Project	17

	Page
III. ANALYSES	21
A. Economic Analysis	21
1. Introduction	21
2. Benefits, Financial Viability and Cost-Effectiveness	22
3. Economic Benefits	22
4. Designing a Financially Viable System	23
5. Beneficiaries	24
B. Social Soundness Analysis	25
1. Definition of Community Participation	25
2. Community Attitudes Toward Water Use	26
3. Decision-making	26
4. Role of the Promoter	27
5. Conclusion as to Social Soundness	28
C. Technical Analysis	28
1. Water Supply and Project Health Objectives	28
2. Technology Choice	29
3. Operation and Maintenance	30
D. Administrative Feasibility	31
1. GOES	31
a. Organizational Structure (Current)	31
b. Organizational Structure (Future)	31
c. Other Resources: Transportation	33
2. Training Institutions	33
3. Project Administration	36
a. GOES Ministry of Health	36
b. USAID	36
IV. FINANCIAL ANALYSIS	38
A. Financial Analysis	38
B. Financial Plan	38
C. Recurring and Replicating Costs	41
V. IMPLEMENTATION PLAN	42
A. Implementation and Monitoring Responsibilities	42
1. Disbursements for Local Currency	42
2. Disbursements for Foreign Exchange Dollar Costs	42
3. Procurement Procedures	43
B. Implementation Schedule	45

11/2

	Page
VI. EVALUATION PLAN	50
VII. CONDITIONS, COVENANTS AND NEGOTIATING STATUS	53

Annexes

ANNEX I:	AID/W Approval Message
ANNEX II:	Contracts
ANNEX III:	Clemens, Bruce: <u>The Operation and Maintenance of Rural Water Supply Projects of MOH El Salvador</u> *
ANNEX IV:	Detailed Budget
ANNEX V:	Administrative Information
ANNEX VI:	Initial Environmental Examination
ANNEX VII:	Logical Framework Matrix
ANNEX VIII:	Checklist of Statutory Criteria
ANNEX IX:	GOES Letter of Request
ANNEX X:	Project Authorization

13

I. PROJECT SUMMARY AND RECOMMENDATIONS

A. RECOMMENDATIONS

It is recommended that a grant be authorized to the Government of El Salvador for \$480,000 to assist in increasing the access of the rural poor to potable water and sanitation. Covering a three year period, operations under this FY 79 funded Grant begin in Fiscal Year 1980 and terminate at the end of Fiscal Year 1982.

B. INTRODUCTION AND SUMMARY DESCRIPTION

1. The Problem

Rural health status in El Salvador is poor. Infant mortality in rural areas exceeds 100 per 1,000 live births compared to 58 for the nation as a whole; life expectancy is a low 54-55 compared to 59 nationally; child mortality is three times higher in rural areas than in San Salvador 1/; and child malnutrition levels are highest in rural areas 2/.

Most of these indicators reflect the role of gastroenteritis and other diarrheal diseases as a key determinant of health status in rural areas where in 1977 they were the leading cause of mortality (12.5% of certified mortality) and of morbidity seen in MOH facilities (61.6%) 1/. Moreover, child mortality statistics attribute more than half of the deaths of children under 5 to gastrointestinal infections and diarrheal disorders 1/.

A major cause of such disease is the lack of access to potable water and sanitation facilities. According to MOH statistics, fewer than 20% of the rural population has access either to safe and adequate water or sanitary and waste disposal facilities. Despite the fact that water systems have been installed in 464 rural communities since 1952, approximately 1,500 rural communities (non-municipal seats) have no such systems. Furthermore, an AID-sponsored sample survey which investigated a random sample of 33 of these systems indicated that 31 (94%) were not fully functional at the time of the site visit. USAID's analysis, based in part on this survey, indicates a major constraint to improving access to adequate potable water and sanitation facilities is the inability of local health authorities to adequately install and maintain water supply and sanitation facilities due to a lack of trained local personnel. Accordingly, the emphasis of this project is directed towards the rehabilitation of existing malfunctioning

1/ GOES Ministry of Health Yearbook 1977-1978.

2/ INCAP Nutritional Functional Classification Study 1975.

water systems, the provision of paratechnical and community development training, improvement of the operation and maintenance program and introduction of appropriate technology designs for water and sanitation systems in El Salvador.

Total life of project costs are estimated at \$896,000, including a GOES contribution of \$416,000 and AID funding of \$480,000. AID's initial contribution of \$390,000 will be made in FY 79 with follow-on funding in the amount of \$90,000 to be provided in FY 81, subject to the availability of funds and the agreement of the Parties.

2. Summary Description

This project will assist the GOES Ministry of Health (MOH) to expand and sustain access of the rural poor to water and sanitation facilities. Current major constraints to construction and maintenance of rural water systems and sanitation facilities are addressed by each of the four project components.

Under Component I, an operation and maintenance survey will be conducted in the 464 communities which have access to rural water systems to determine the physical condition of each, the quality and quantity of the water supplied, the community's role in operation and maintenance activities, any existing operating problems, routine maintenance needs, and financial viability of the systems. Based on the survey results and an analysis of the MOH/Rural Water Supply Department (DAR) revolving fund, cost-effective maintenance program will be designed which will place emphasis on preventive maintenance activities.

Under Component II, and using the results of the O&M survey, a curriculum will be designed to carry out training courses for DAR personnel employed to operate and maintain rural water systems. Individuals who will receive the short, two-to-three week periods of instruction include 20 plumbers, 120 pump operators, 500 community-based water system operators and 16 electrical technicians. Courses will be tailored to fit the needs and capabilities of each group, with electrical technicians and regionally-based plumbers receiving the most advanced and intensive instruction. This training will provide a basis for initiating routine operation and maintenance activities at the local level and will insure that a more advanced maintenance capability is available within the regional health offices. At least ten deficient rural water systems will be restored to full operation as part of the practicums associated with coursework. Use of the results of the survey conducted under the first component to design the curriculum will ensure that the courses are germane to the operation and maintenance needs of the regional MOH offices.

Under Component III, the skills of 15 DAR rural water promoters will be upgraded in an extensive training program including didactic and field

16
work. These promoters will receive training in technical as well as socio-cultural aspects of rural water supply, construction, operations and maintenance. Upon completion of the nine month course, the "Constructores/Promotores de Acueductos Rurales" -- or CPARs as they will be renamed -- will be responsible for organizing communities, completing initial technical studies, assisting in the development of more detailed technical studies required to design rural water and latrine facilities supervising water system and latrine construction and health education activities, inaugurating these systems and supervising follow-up activities in operation and maintenance. The increased skill level of these intermediate-level technicians is expected to augment MOH/DAR regional capacity to undertake greater responsibilities thereby encouraging a process of decentralization.

Component IV will provide skilled engineering assistance to design five to ten rural water systems using appropriate technologies. From 800 rural water system applications presently on file at the DAR, contracted consultants will select 50 communities which will be investigated for appropriate technology design feasibility. Based on the results of these field studies five to ten DAR approved water systems will be designed using technologies or modifications thereof, which have not yet been tried in El Salvador. Systems using these designs will be built under the DAR/UNDP project which proposes the construction of 30 such pilot projects. As a final activity under this component, a report will be developed identifying other rural communities, not yet served by water systems, to which the new technology designs will be applicable.

The activities that will be undertaken within the four components will lead to an increase in the quality of construction and maintenance of rural water supply systems with a new emphasis on integrating environmental sanitation and health education activities into the MOH methodology. As skill levels of lower-echelon DAR personnel are upgraded, their ability to install and maintain rural water supply systems and sanitation facilities will increase as will the number of rural poor beneficiaries served by those systems.

II. PROJECT BACKGROUND AND DESCRIPTION

A. PROJECT GOAL AND PURPOSE

1. Project Goal

The rural water supply and sanitation project goal is to reduce the incidence of disease in the rural poor of El Salvador.

2. Project Purpose

The purpose of the proposed project is to expand the number of rural poor effectively served by the Ministry of Health potable water supply and sanitation facilities. By so doing, the project will attack one of the primary causes of mortality and morbidity among the rural poor of El Salvador, gastroenteritis and other diarrheal diseases.

3. Project Relationship to the CDSS and the Health Sector

This project supports the overall CDSS goal of improving the lives of the poor by directly improving the access of 13,000 rural Salvadorans to the means of meeting a basic need, i.e., potable water and adequate sanitation. Moreover, the project indirectly will improve such access for at least 476,000 others by improving operation and maintenance capabilities of the Ministry of Health through the training of (1) 15 water promoters in technical and community development aspects of rural water supply and sanitation; and (2) 620 community level water workers, thereby allowing more effective installation of new systems and use of existing ones. This project thus is aimed as well at the improvement of El Salvador's human resource base, a second area of emphasis in the CDSS.

A.I.D.'s role in the project is largely that of an innovator and a catalyst, as is advocated in the CDSS given the relatively low level of A.I.D. funding resources in comparison with those of other donors. In this case, although the total A.I.D. grant is low compared with those contemplated of IDB and UNDP, USAID is addressing an area that is a key to the effectiveness of their inputs, but one that has not been a focus to date in their investments, i.e., improvement of MOH maintenance capacity. Moreover, several of the elements in this grant are designed to serve as the foundation for planning the third IDB investment in rural water.

The project complements A.I.D. activities in the Health/Population and Nutrition Sector which are designed to improve rural health status. The rural water promoters will work with rural health aides, trained under two other A.I.D. projects, in their various cantones in establishing water systems. In several cases, RHAs are members of the water juntas. The technical assistance in community development training to be provided to the MOH National Health Training School under this project is expected to upgrade this key aspect of the training of all rural health workers

17
but especially that of rural health aides and their supervisors. The project is tied into the USAID's Population Initiative by inclusion of a family planning promotion and information segment in all community development training programs. Finally the project is designed to support USAID's efforts to improve nutritional status by affecting a leading cause of malnutrition -- diarrheas resulting from contaminated water and inadequate sanitation practices.

B. BACKGROUND

This project, a direct assistance grant to the Government of El Salvador, seeks to alleviate poor health conditions in rural El Salvador by increasing the access of the rural poor to potable water and adequate sanitation. The project, initiated in direct response to a request from the President and Minister of Health for USAID assistance in El Salvador's rural water supply sector, is USAID's first venture into the rural water supply sector in El Salvador.

The project conforms well with AID's participation in the upcoming UN Decade of Water, 1981-1990, as discussed in recent Agency policy statements ^{1/}. Furthermore, it is a part of a much larger initiative of the GOES under its Five Year Plan (1977-1982) to greatly increase access of the rural population to potable water supply and sanitation facilities.

Within the GOES, the MOH has been assigned the responsibility for provision of potable water and sanitation facilities to the rural populace. Under this program, which is directly supervised by the MOH Bureau of Health Engineering and Rural Water Supply (DAR), water systems have been constructed or expanded in 464 communities since 1955. At present 476,000 rural inhabitants (19% of total rural population) have direct access through house or patio connections or nearby public standpipes. Another 13%, 319,000 people, are benefitted by water supply systems which are within walking distance of their homes. Under the expanded program envisioned by the MOH in the current Five Year Plan, the GOES proposes an expenditure of \$174 million, including financing for the construction of 750 to 1,000 water systems, drilling of 500 deep wells, and provision of 320,000 latrines. Although this is an extremely optimistic projection, the Five Year Plan suggests the Ministry's commitment to the provision of water supply and sanitation to its rural clients.

1/ STATE 316235/01, "Water and Sanitation Initiative", December 15, 1978 and AID/W Circular "Potable Water: Results of AID Workshop", December 16, 1978, which urge that rural water supply activities emphasize paratechnical training, community development, improvements on operation and maintenance of water systems and development of programs with a range of inputs including health education and sanitation.

1. Synopsis of MOH Rural Water Supply Program

The MOH rural water supply program conforms closely to those found throughout Latin America ^{1/}. The program features a centrally dominated planning and administrative authority in which most planning, design, and operation and maintenance activities are the responsibility of the centrally located, national office (see Administrative Information Annex Q). Consequently, the vast majority of the DAR's technically expert personnel is located within that central office, leaving the four regional offices manned by an engineer and rural water supply technician with supervisory duties and a staff of tariff collectors, plumbers, and promoters. Accordingly, the regional staff responsibilities lie largely in the collection of preliminary data for system choice and design, involvement of the community in project construction phase, supervision of construction, and in follow-up operation and maintenance. All technically advanced activities involving data collection and analysis, design, and maintenance are performed by the more sophisticated technicians and engineers concentrated within the central office.

Historically, the DAR has designed and installed a diversity of water system types based on the characteristics of the communities to be served. These system choices can be broadly categorized as follows: (a) simple, hand-pump well or spring systems for dispersed populations; (b) rudimentary water systems using spring or well sources for semi-concentrated populations; and (c) more sophisticated systems using high-volume, deep wells with electric pumps for concentrated populations. In recent years, the MOH has emphasized use of the latter, more sophisticated system, often supplying water to 3 or more communities from one deep well water source using an electric submersible pump. This design choice has been justified on the basis of both a demographic pattern of high-density rural settlements and a conclusion that such systems provide the most technically and economically advantageous means of serving large numbers of rural inhabitants.

To finance the operation and maintenance of its rural systems, the DAR has adopted a policy of user fee collection, basing the schedule upon level of service and system operating expense. Collected revenues for user services are placed in a centralized DAR revolving fund from which all operation and maintenance expenses are to be financed. Amortization of systems' capital costs are met through other government revenues.

^{1/} Donaldson, David, "Progress in Rural Water Programmes of Latin America" Water Wastes and Health in Hot Climates. edit. by Feachem et. al. John Wiley and Sons, 1971, pp 213-217.

2. Rural Water Supply Program Institutional Deficiencies

In response to the GOES request for USAID assistance in rural water supply, USAID contracted technical assistance to analyze the DAR program and to identify activities in the sector in which AID could effectively devote resources. The analysis indicated institutional deficiencies which inhibited the MOH capacity to provide effective potable water and sanitation services to its rural clients. These deficiencies were broadly grouped into four categories: (a) inadequate operation and maintenance capability; (b) lack of meaningful community participation; (c) inadequate capacity to meet the demand for installation of new water systems; and (d) lack of diversity in technology choice. An examination of other donor activity in rural water supply revealed that although substantial funds were being made available for capital investment in rural water supply systems no resources were allocated for the correction of these deficiencies. If permitted to continue unaddressed, such deficiencies would greatly reduce the beneficial effects otherwise attainable from the large and growing MOH rural water supply program. The AID grant is designed to address these deficiencies which are discussed in more detail below.

a. Inadequate Maintenance Capability

The extent of the operation and maintenance-related problems confronting the DAR is illustrated by a field study conducted in preparation for project identification and development^{1/}. In thirty-three randomly selected project sites, an examination of 114 water taps revealed that 40% were not functioning. Direct causes of the breakdowns ranged from malfunctioning pumps to broken pipes. The systems selected in the survey included gravity flow, electric pump and hand-pump systems with various levels of services ranging from house connections to community taps. Only two systems were fully operational at the time of the visit. The study further revealed that although the capability for major maintenance exists largely through use of centrally located technicians, minor maintenance is virtually non-existent. This is evidenced by the fact that systems will generally be allowed to break down completely before receiving attention. Water systems that are only partially operational or have become polluted due to minor maintenance problems are not likely to receive attention.

An examination of the DAR program of operation and maintenance indicates that the poor level of service is caused by a variety of factors. First, the DAR has not institutionalized any program of routine, preventive maintenance. Secondly, the DAR lacks adequately trained and mid-level personnel to sustain an effective program of operation and maintenance. The MOH offers no training courses for rural water supply personnel and, in fact, has not offered a training course for rural water promoters since 1972. Regional maintenance personnel lack the necessary expertise for running an effective maintenance program while local plumbers and pump operators have had little training. The extent of their expertise depends on their

^{1/} See: Clemens, Bruce: The Operation and Maintenance of Rural Water Supply Projects of MOH El Salvador, Annex III.

20

intuition, that knowledge which can be obtained from the regional health engineer, and protracted work experience with the systems. Local individuals at the community level have no training in systems of maintenance and are not usually involved in that aspect of operations. Regional health staff must frequently rely on experts sent from the central office in the capital city for the necessary maintenance skills. In fact the regional offices have no capability to perform routine electrical repairs and maintenance tasks and must rely on electricians sent from the central MOH offices located in San Salvador. Finally, the lack of community participation and involvement in all but the pre-construction and construction stages of the systems inhibits proper maintenance.

Closely related to the problems of operation and maintenance are the financial problems associated with meeting operating costs. Discussions with the MOH indicate that the revolving fund used to finance program operation and maintenance has not been adequate to defray expenses. Financial data regarding this fund is detailed in the Economic Analysis and reflects the Ministry's inability to collect user charges. Delinquencies in user payments must be considered due, at least partially, to the poor operating conditions of many of the systems. Local beneficiaries, with justification, are reluctant to pay for non-operational or poor quality service. Similarly the level of service provided to many users is beyond their ability to afford, and cost estimates upon which the tariff schedule is based may be inaccurate.

b. Lack of Meaningful Community Participation

Examination at the community level of the DAR program for the provision of water supply reveals a lack of meaningful involvement and participation of beneficiaries throughout phases of the project from conception, to design, installation, operation and maintenance. As a result benefits otherwise attainable through the installation of potable water supply are substantially reduced. Such a lack of community participation has its greatest impact during the period of operation and maintenance following system inauguration. The previously cited operation and maintenance survey identified the lack of community interest, as revealed by either the refusal to pay maintenance fees or the refusal to control the overuse of water, as the single most prevalent problem leading to system failure.

A community participation program is currently included within the methodology used by the DAR to implement rural water systems. It is, however, best termed a program of community involvement rather than participation. The focal point of that effort is the promoter who canvasses the community in an attempt to determine both need and willingness to pay. During the construction phase, the promoter recruits individuals to supply both the labor and local materials necessary for construction and then helps to establish a 3 person Junta Administradora (Board of Directors) to supervise the operation and maintenance of the system. The deficiencies with this approach are discussed in the Social Soundness Analysis. They

11

can be summarized, however, as a lack of recognition of the importance of the particular socio-cultural patterns of a community to successful stimulation of its participation in water system development, operation and maintenance.

c. Inadequate Capacity for Project Preparation and Installation

The lack of trained paratechnical and technical personnel at the regional and local level not only limits operation and maintenance capabilities but also constrains regional capacity to prepare and construct a sufficient quantity of rural environmental sanitation projects. Reportedly in one region alone there are 200 formal requests for community water supply systems which have not yet been constructed. As funds are increasingly made available during the UN Water Decade, this lack of trained local and regional personnel will even more seriously constrain utilization of these resources.

USAID believes that this personnel gap can be alleviated by increasing technical skills of the rural water promoters presently employed at regional level. Increased technical expertise at regional level in phases of design, construction and operation would, in effect, decentralize technical project responsibilities by minimizing the dependence of the regions on technicians of the central (DAR) office. Such decentralization should in turn greatly facilitate project design and installation procedures.

d. Lack of Diversity in Technology Choice

The current DAR policy of installing deep well electric submersible pumps systems, designed to serve three or more communities, tends to accentuate both the operating expenses and the need for more sophisticated maintenance personnel. The system size and complexity may alienate villagers and exaggerate existing management and operation requirements with rural water supply systems. In addition, the initial capital costs associated with such systems may also be proportionately larger than those required for small, separated systems.

The DAR previously utilized simpler technologies to a greater extent and, although some problems have been noted with those systems (i.e. poor maintenance records for hand pumps), possibilities exist for their continued implementation. In addition, a variety of other previously untested technologies, such as lateral drilling, are applicable to rural El Salvador. Experimentation with these new designs could lead to an expanded choice of technologies for rural water supply systems.

C. DETAILED DESCRIPTION OF PROJECT

Activities under this project are designed to address the inability of the DAR to adequately maintain its rural water supply systems and to meet the present and future demands for installation of water systems.

project emphasizes decentralization of many DAR activities away from San Salvador to the regional offices by improving the technical capacity of regional and individual community personnel. The project advocates a development of a fully integrated approach to rural water supply, including effective and meaningful community participation, installation of latrines, health education, and a balanced program of preventive and corrective maintenance. Project activities have been segregated into four individual components, all of which have been specifically requested by the DAR:

1. Operation and Maintenance Survey and Design of DAR Maintenance Program.
2. Operation and Maintenance Training.
3. Training Program for Mid-Level Rural Sanitation Constructor/Promoters (CPARs).
4. Appropriate Technology Design.

Component I: Operation and Maintenance Survey and Design of DAR Maintenance Program.

The objective of this component is first to provide the DAR with basic data regarding the present state of its existing water systems. The data will provide a basis for implementing a program of remedial and preventive maintenance and community development. Second, using data collected during the survey, an extensive analysis of the current operation and maintenance practices of the DAR as well as the financial viability of the program will be performed. On the basis of the survey and analysis a complete program of operation and maintenance will be developed which includes the elaboration of water system operator practices, detailed schedules for periodic maintenance, and extensive operation and maintenance manuals.

1. Operation and Maintenance Survey

The survey, which will be designed and supervised by MOH contracted technical assistance, will be carried out by the 30 water promoters now employed by the regional offices. It will include an examination of the electrical distribution system including the transformers, insulators, the distribution line, and the various electrical connections at both the pump motors and transformers; verification of the integrity of the water distribution network including valve boxes, house connections, pipe fittings and reservoir connection; examination of the water source regarding its appearance and sustained quality; an inspection of the pump equipment including pressure and performance tests and oil gauging. Also included in the survey will be an evaluation of the extent to which the community meaningfully participates in the system operation, its satisfaction with the system, and the extent to which the community was effectively assessed and involved in initial project design and installation. To ensure that the survey will be conducted effectively the 30 promoters will be given a five week course of instruction in technical and community matters necessary for the study.

23

The survey will be conducted over a period of five months, averaging one system per day. The collected data, combined with financial data available at the regional office, will be compiled, analyzed and presented in a report for each system which will identify its operational condition, its financial viability, and necessary remedial maintenance and community development activities. This activity will be carried out by contracted technical assistance working with regional staff. (See Administrative Feasibility and Contract Annex).

2. Survey Analysis

Using the prepared reports and personal observation obtained through field investigations, the contracted consultants are to prepare a report describing the major operational and maintenance related problems found to be prevalent in the systems. The analysis is to identify those technologies most prone to failure, the types of routine maintenance apparently necessary for smooth system operation and maintenance, and the personnel skills necessary for conducting such a maintenance program.

The analysis will include an assessment of the financial viability of the DAR operation and maintenance program. This will involve a detailed examination of the DAR Revolving Fund which is used to finance the program. Data to be collected would include:

- a) sources and uses of revenues actually collected;
- b) present rates and systems of collection;
- c) potential revenue, including reasons for losses; and
- d) funding from central government directly or indirectly supporting the system.

This basic analysis should be combined with data from the field studies of the operation and maintenance survey. The result should be a financial analysis that lays out alternative policies to guarantee a financially viable system that can support whatever type of maintenance system is decided upon.

Alternative decisions which should be considered include:

- a) increased local level disbursement to finance local maintenance programs;
- b) adjustments in water fees;
- c) water metering;
- d) creation of a special fund to purchase parts and materials to guarantee availability; and
- e) subsidies from the central government budget.

3. Design of Maintenance Program

On the basis of the analysis a detailed program with cost estimates will be prepared to guide the rehabilitation of those systems found to

require remedial attention and to avoid future system breakdowns. This program will address all levels of DAR operation and maintenance from the central office to the communities. Emphasis must be placed on a balanced program of preventive and corrective maintenance since the preventive approach results in a more efficient allocation of financial and personnel resources and results in greater user satisfaction. Effective organization of the operation and maintenance program of the DAR requires development of operation and maintenance standards and manuals, personnel identification and task specification, operational logs with corresponding procedures for interpretation, and a rigorous schedule for maintenance at all levels.

Component II: Operation and Maintenance Training

The purpose of this component is to conduct a training program at all levels of DAR and in the communities which will provide the necessary skills to implement all aspects of the operation and maintenance program designed under the previous component. The various personnel roles designated under that plan are to be specified so that operation and maintenance functions and responsibilities will be decentralized away from the central DAR office to the regional offices, leaving only the most complicated and sophisticated duties and procedures to the central DAR office staff. Care must be taken, however, to insure that responsibilities delegated to regional and community personnel are realistically within their post-training level of capacity.

Preliminary analysis performed during project preparation indicates that new roles or tasks will be assigned to the national electromechanical personnel, regional plumbers, rural water promoters, and pump operators and community systems operators. Most of the national electromechanical staff will be relocated and, therefore, delegation of most of their project installation and repair duties will be made to the newly organized regional staff. Under the new program, the regional plumbers will perform those tasks now assigned to them along with additional routine maintenance chores which will be identified in the maintenance plan designed under Component I. The training courses under Component II will insure their ability to perform these tasks effectively. Pump operators and community systems operators will also continue in their basic duties of filling the reservoirs but in addition will be taught and assigned duties of system surveillance, routine maintenance, and simple repairs.

Training of these key operation and maintenance personnel will include a specification of their respective duties and instruction on their performance. The course work given to the plumbers and regional electromechanical technicians requires sophistication and consequently, this training will be given centrally, using the facilities of Ministry of Health National Health Training School (Escuela de Capacitación Sanitaria) in San Salvador. Due to the relative simplicity of the tasks involved,

21

community level personnel will be instructed at Regional Centers or at local community locations by the water promoters trained under Component III. In this way full advantage will be taken of the promoters' familiar with these communities. Accordingly, during their training the promoters will be instructed in a basic operations and maintenance curriculum and appropriate teaching methods. An integral part of all operation and maintenance training will be practical field work in repairing at least 10 deficient rural water systems, identified through the survey. Training curricula and materials as well as some course instructors will be provided by the technical assistance firm contracted for the operation and maintenance survey and analysis.

The new operation and maintenance program developed under Component I will be presented to DAR central and regional technical staffs in a series of seminars and will be taught to operation and maintenance staff in short two to three week courses.

Component III: Training Program for Mid-Level Rural Sanitation Constructor/Promoters or CPARs (Constructores/Promotores de Acueductos Rurales).

This component is to establish the position of mid-level water constructor/promoter, or CPAR within the regional structure of the DAR thereby increasing regional technical capability to perform more technically sophisticated feasibility studies, to provide adequate supervision for construction activities, and to undertake an enhanced program of community development and participation. Present duties of the water promoters are confined largely to the collection of demographic, socio-cultural, and elementary technical information, and recruitment of a labor force during systems construction. To increase the capacity of the regional staff, substantial training in both technical matters and community participation activities will be provided to the water promoters. Due to constraints imposed by regional workloads, the technical education will be limited to 15 of the DAR water promoters whose selection will be based primarily on an assessment of capability and motivation made during the prior training given to all water promoters for the operation and maintenance survey. The CPAR course will include 24 weeks of intermittent classroom instruction spread over a two year period, in addition to approximately 15 weeks of supervised field experience. This field work will consist of construction activities on any of 15 water systems being built under IDB loan project. (See Other Donors, P. 19)

In their new roles, the promoters will carry out technical feasibility studies requiring that they be able to conduct topographic surveys, identify all available water sources, analyze proposed water sources according to quality and quantity, and identify possible sanitation alternatives. (See Administrative Information Annex) concerning present and future DAR staffing and organization as well as CPAR curriculum development.) With such elevated capacities at regional level, the need for centrally located

technical staffs to perform relatively simple tasks at community locations will be reduced. Technical tasks, however, requiring greater expertise, particularly detailed geohydrologic assessments, will continue to be performed by the staff located in the central DAR office and responsibility for final project design will remain with that office.

All 30 water promoters will receive community development training. Two courses will be scheduled so that 15 water promoters who do not participate in the initial CPAR training will receive the same five week course designed to increase their capability to facilitate participation of the community in all phases of project conception, design, construction, operation and maintenance. Of primary importance in connection with feasibility studies for system installation is instruction in the techniques of community analysis as discussed in the Social Soundness Analysis. The promoter should be trained or "sensitized" in effective use of community analysis in all phases of his work. It is particularly important that the formal management arrangement which the promoter helps to establish for overseeing the continued operation and maintenance of the system be formulated with full regard to the socio-cultural milieu of the community identified in the analysis.

Finally, given the importance of personal, family and community hygiene to the positive impact of water projects on health, the promoters will receive classroom and practical training in health education and promotion.

Component IV: Appropriate Technology Design

The objective of this component is to expand the range of choices and the DAR capacity to select, design, and implement appropriate water supply technologies in those rural communities for which at present no system has been designed. This will be accomplished by first examining 800 existing applications for water systems and categorizing each according to specific physical, cultural and economic parameters which would then provide a basis for a generalized choice of appropriate technology. Following this document study, a set of 50 localities will be selected for extensive field investigation and the preparation of preliminary technical documents. From these 50 field investigations five sites will be selected for which detailed plans will be developed implementing appropriate technology choices to be reviewed with the DAR. Engineering consultants will be contracted who have demonstrated expertise in selection, design and implementation of water supply systems using alternative technologies. They will be assisted in the field investigations by DAR promoters or CPARs. Activities under this component will begin during second year of the project and will continue for forty-six weeks. The appropriate technologies produced under this component will provide a basis for implementation of a number of UNDP pilot projects. (See Other Donors).

Moreover, as a final task the contractor will prepare a report identifying the potential applicability of the five to ten new technology rural water system designs to other rural Salvadorean communities which lack potable water.

D. PROJECT RELATIONSHIP TO GOES AND OTHER DONOR PRIORITIES

Other donor as well as GOES activity is a critical complementary aspect of the proposed project. Since 1977 all the major potable water donor agencies have offered significant sums of money to the DAR for the expansion of rural potable water systems. Although substantial funds from other donors have been and are to be made available, none is designated for use in training programs or other activities similar to those included under this project. Nonetheless discussions held recently with the Inter-American Development Bank (IDB) the largest donor in potable water, revealed that IDB officials perceive a definite need for the kinds of activity included under this project.

In general terms, other donor activity in the area of rural potable water has been concentrated on system construction and professional level training of MOH personnel. For example, the IDB and CIDA have financed systems construction while the UNDP, along with PAHO and UNICEF, are involved in programs of professional training and institution building as well as latrine installation and water delivery through system construction.

The following description of rural water supply programs executed in the last five years or planned in El Salvador in the next few years indicates the substantial involvement of other donors in rural water and sanitation. Simultaneously it reflects the increased demands placed on the MOH/DAR by such activities without a concomitant increase in the Ministry's and communities' capacity for system installation and maintenance, aspects which this AID project addresses.

1. Ministry of Health

In coordination with other donors, the MOH has been very active in rural system construction/installation. From 1955 to 1978 the MOH has with its own funding built or expanded systems in 464 small towns (cantones) providing approximately 476,000 of El Salvador's rural populace with potable water from house connections or public taps. The current Five Year Plan (1978-1982) includes proposed GOES programs totalling \$174 million for provision of rural potable water and basic sanitation systems. Generalized goals for this period in these areas of concentration are (a) construction of 750 to 1,000 water systems, (b) 500 deep wells drilled, and (c) provision of 320,000 latrines.

42

2. Inter-American Development Bank (IDB)

The IDB is in the second stage of a three-phase program to improve rural water supply. Under the first loan, 1973-1976, water was supplied to 102 communities containing a population of approximately 73,000 at a total cost of \$3 million, one half of which came from IDB. The second loan, begun in June 1976, provides funds for construction of 50 systems to serve 125 communities and a population of 100,000 at a total cost of \$7.3 million of which IDB is providing \$4 million and the Canadian International Development Agency (CIDA) \$1.2 million. Construction of systems under this loan, slated for completion in September 1981, is ahead of schedule.

Upon disbursement of 75% of these funds, IDB plans to undertake a third phase rural water supply loan at an estimated cost of \$12-15 million for system construction throughout the country.

3. IDA

In addition to providing funds for construction and equipment in combination with the IDB, CIDA is negotiating a grant to establish mobile, regional water testing laboratories. CIDA is presently developing a three year grant proposal totaling \$920,000 to implement a nationwide system for water quality control in rural areas. Funds will be utilized for contracting of specialized technical assistance, professional training in water quality analysis, and acquisition of materials, equipment and vehicles. Four mobile laboratories will be developed to undertake chemical/bacteriological analysis of rural water sources such as wells, rivers, streams and natural springs. The GOES counterpart for this project is estimated at \$500,000. IDB personnel indicate that CIDA also may be interested in providing some financing in combination with an IDB third phase rural water loan which is scheduled to begin operations in 1982/83. CIDA participation in this third phase, however, would depend to a large extent on the timely disbursement of CIDA funds provided in combination with the second phase IDB rural water loan.

4. UNDP/UNICEF

UNDP/UNICEF are cooperating with the GOES in a three year program (1979-1981) to promote potable water supply and latrine installation in three departments in El Salvador's eastern region. The program combines engineering technical assistance from UNDP/PAHO with materials support from UNICEF (a) to build rural water systems in 30 communities to benefit 25,000 villagers and (b) to construct 10,000 latrines for 60,000 inhabitants. This program, to be followed by a second stage of assistance in 1981-1983, emphasizes community development and health education aspects of rural sanitation. The total cost is estimated at \$15.5 million with the GOES to provide \$8 million and UNDP and UNICEF each providing \$3.75 million.

UNICEF also plans to grant \$360,000 to the GOES to finance the purchase of well drilling materials and equipment, tubing, submersible electric pumps, professional training in environmental sanitation and materials for latrine construction. This proposed financing will form a part of the GOES's planned Northeast Integrated Development Project which will concentrate on the departments of San Miguel and La Unión (northern portions) and the entire department of Morazán. This area of the country is one of El Salvador's major "critical zones" and will receive special attention in numerous development sectors in the GOES's development programming during 1978-1982.

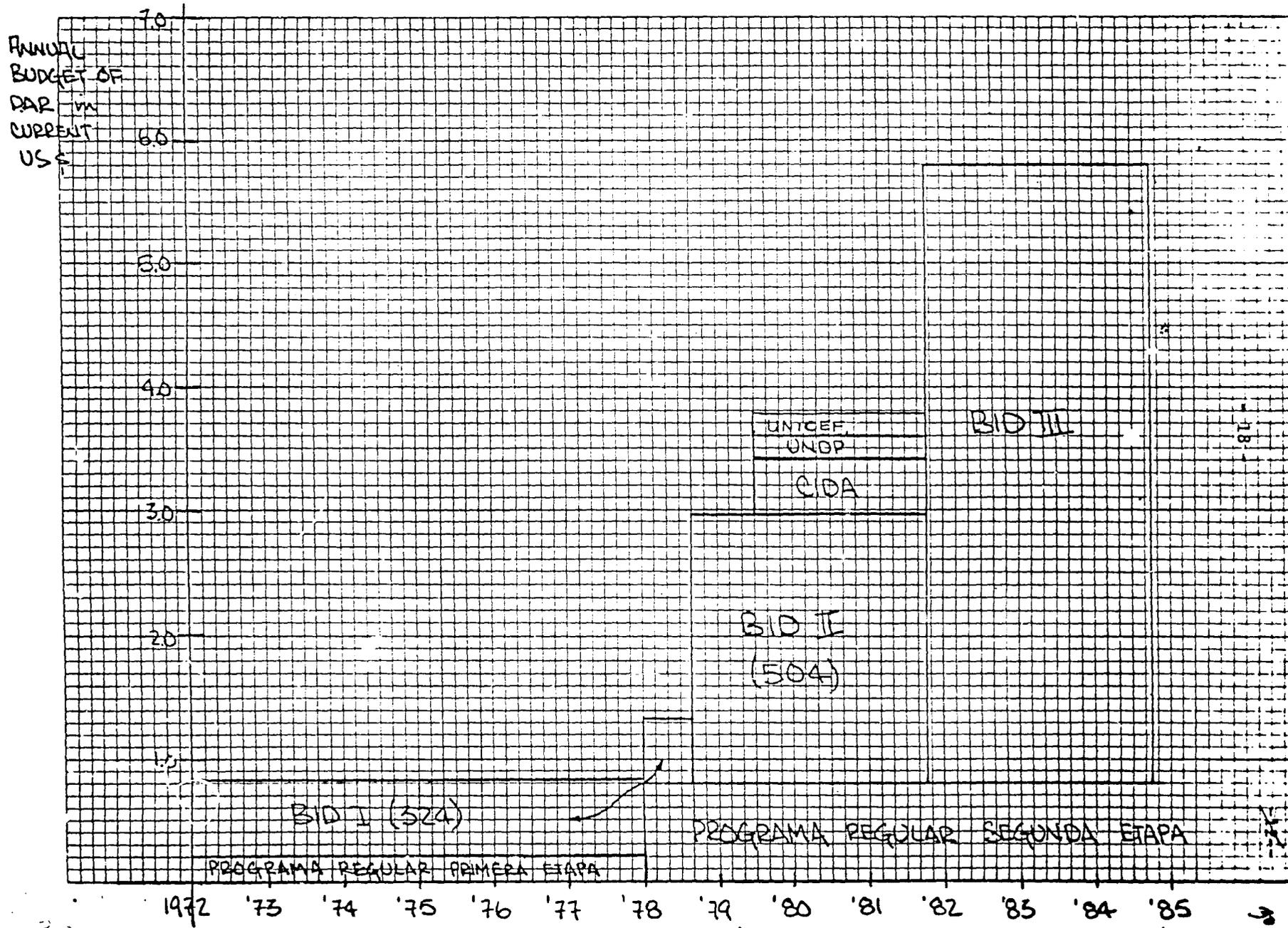
The graphic display on the following page demonstrates the substantial amount of resources presently available to the MOH.

5. Coordination with AID Project

Other Donor inputs are in several cases directly complementary to the AID project. For example, as a prelude to the larger scale UNDP/UNICEF assistance discussed above, under a \$350,000 grant in rural sanitation to be signed in late 1979, UNDP will furnish administrative support to the GOES as well to the AID/GOES project. Under this grant UNDP has contracted a PAHO engineer to provide the DAR with administrative and organizational assistance including the development of MOH operational policy in rural water and sanitation. The UNDP grant will also provide professional level training for water engineers and hydrologists and support construction of up to 30 "pilot project" experimental water systems in the northeastern area of El Salvador. It is expected that these pilot projects will test various types of the low cost appropriate technologies including those designed under Component IV of the AID project.

The AID project effort will benefit from these latter activities through the in-service training that CPARs, promoters and plumbers, etc. will receive by working on the MOH/UNDP pilot systems, organizing the communities to stimulate maximum participation and observing the viability and value of appropriate technologies. The UNDP program will also enhance the community development capability of the MOH/DAR through improved organization of the DAR methodology and possible funding of training for 15 additional CPAR promoters, thereby complementing and expanding upon the AID project effort in this area.

As previously mentioned, CIDA is presently assisting the MOH, in concert with IDB, with funds for construction of systems and provision of jeep and van-type vehicles for support of the construction activity. A number of these vehicles will be made available to the personnel to be trained or otherwise involved in the AID project. CIDA's current project planning, however, reflects a shift in emphasis away from direct construction to provision of software capability in water quality control, by setting up four mobile laboratories for biochemical analysis. This will provide a complementary facet to IDB's concentration on system construction, the UN's emphasis on professional training, administration and



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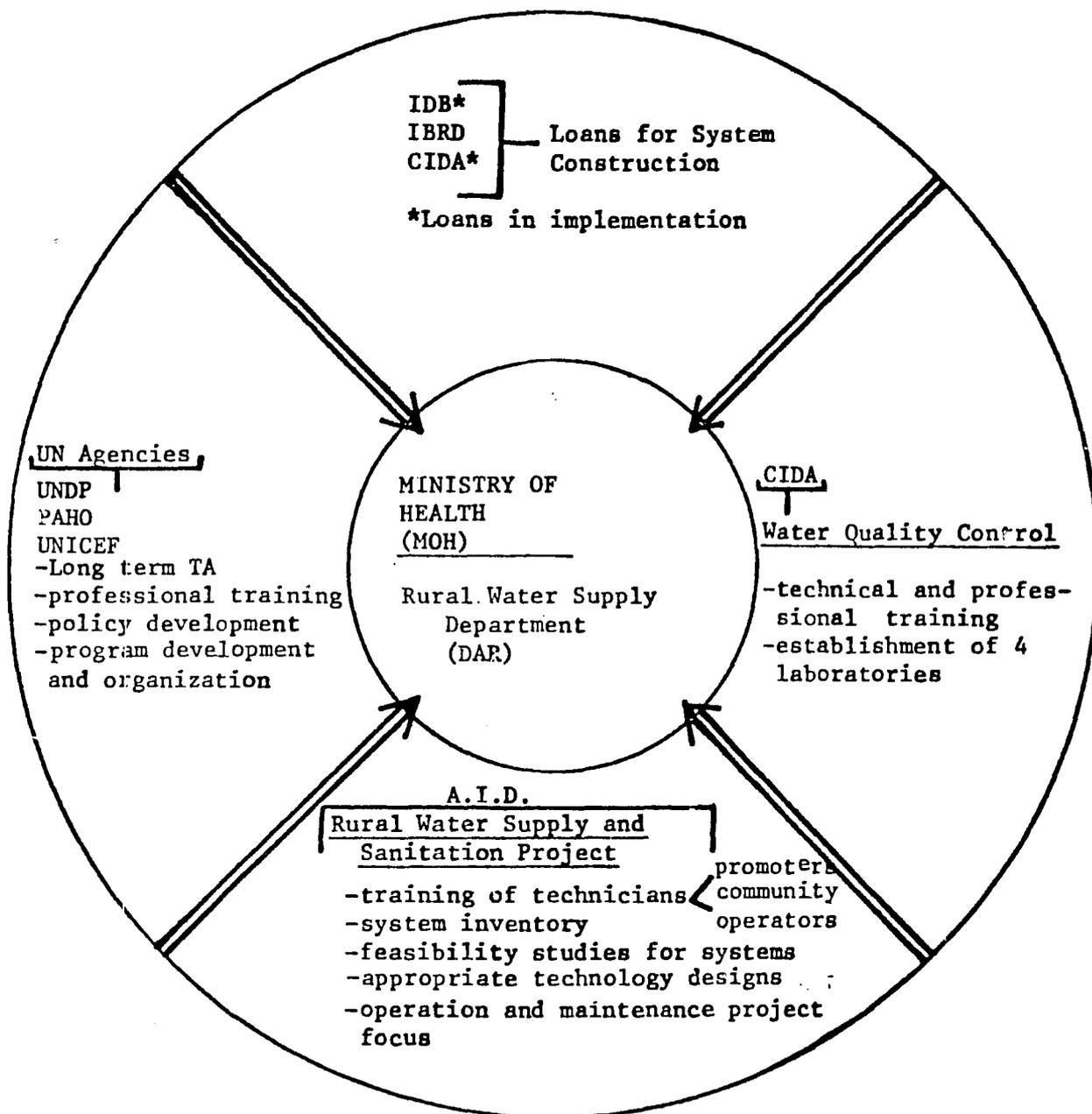
policy development, and testing of different technologies, and to that of AID in training intermediate and lower level personnel.

The IDB's Phase II water system construction loan will also provide support to the AID project, as 15 water promoters whose skills are upgraded to the CPAR positions will receive on-the-job practical training in actual construction of IDB and MOH funded water projects. When the CPAR training course is completed these newly skilled workers will be assigned to projects in the communities where several of the IDB financed systems will be built.

Figure A summarizes the main inputs of other donors and AID in the area of rural water supply and sanitation.

Figure A

Other Donor Inputs to the Ministry of Health/Division of Rural Aqueducts



33

III. ANALYSES

A. ECONOMIC ANALYSIS

1. Introduction

This grant project is the result of an effort to identify the constraints to effective expansion and maintenance of rural potable water supplies in El Salvador as discussed in Section I and II of this document. On the basis of a systems analysis of (a) the manner in which rural potable water supply is being expanded, and (b) alternative ways in which AID might support such expansion, the present project design, which emphasizes improvement of operations and maintenance capacity, was selected as being the most appropriate from an economic as well as a technical point of view 1/.

As discussed previously there has been a steady expansion of rural water systems. By 1978, approximately 476,000 persons (19% of the rural population) were benefitting from some access to potable water. Capital investment in new systems has been adequately financed through other donor lending and GOES capital budget appropriations. However, this capital plant must be properly operated and maintained if it is to yield the intended social and economic benefits expected from potable water supply.

The central government budgets a minimal amount to finance the overall administration of the system. On-going maintenance of the system is financed through user charges which flow into a revolving fund. These funds are maintained at four regional levels. It is here, however, that the system breaks down. The loss of revenue that is directly attributable to improper or inadequate system maintenance detracts directly from the financial and economic well-being of the systems.

Centralized administration and lack of adequate local maintenance result in low operating efficiency and a failure to deliver good quality water. As potential users find water unavailable, payment to the system stops. This in turn results in a decline in the funding necessary to finance maintenance. For example, a survey of 33 systems showed that 31 were not fully functional. Of 114 water taps checked, 40% did not function. Since investigations to date do not indicate that consumers are opposed to present user fees, it can be assumed that fully maintained systems would result in major revenue increases to the revolving funds.

1/ See: Clemens, Bruce: The Operation & Maintenance of Rural Water Supply Projects of MOH El Salvador, Amex III.
Kublawi, Salim: Economic Analysis and System Evaluation for Rural Water Supply and Sanitation: El Salvador, USAID/El Salvador.

This analysis leads to the conclusion that concentration on maintenance improvement through reorientation and upgrading of the personnel system under Components II and III of this project will have a major cost-savings effect on rural water supply. By so doing major capital repairs can be avoided and the life of capital lengthened. It further offers the possibility of increasing water supply at a lower unit cost. It is assumed then that this will lead to major economic gains in terms of improved living conditions and health status.

2. Benefits, Financial Viability and Cost-Effectiveness

Benefit-cost analysis for this type of project is impractical due to the difficulties and high costs of generating the necessary data base. The decision that this project represents a cost-effective approach to water delivery improvement has been based on the systems analysis described above, although few hard data are available to document this conclusion. Ultimately, support for this type of project rests on equity considerations and the desire to meet the minimal needs for water and good health among the rural poor. The project is designed to generate supporting data on project operations on a systematic basis which will provide the MOH and USAID with a basis for judging the cost-effectiveness of approaches being implemented. Improvement of the water management system based on this type of analysis can then be incorporated into the project. Given the proposed level of expenditure, this approach is preferable to engaging in a sector analysis that could involve project delay.

The remainder of this economic analysis lays out the benefit rationale for the project and the basic issues that will need to be addressed during project implementation.

3. Economic Benefits

During training under Component II, 10 systems will be repaired to the standards of service delivery established in Component I. Approximately 13,000 rural residents will benefit. Although limited to the degree the system can be upgraded, two types of benefits can be expected. First, time savings and an improved sense of well-being will accrue to the community due to increased access to water. Second, cost of treatment of water-related disease will be avoided. The Background Section discusses the high incidence of such disease in rural El Salvador indicating that cost savings could be substantial. From an economic standpoint cost avoidance accruing to the family in terms of reduced medical bills, and to the family and nation in terms of work-hours gained, represents a real offset to any increased maintenance costs. Within the next several years benefits will accrue to that portion of the 476,000 rural persons already served by partially-functional systems as well as to persons expected to be served by new systems. Component I, the O&M Survey of existing systems, will provide data to estimate actual numbers of individuals benefitting from improved maintenance. Such data will be essential to decision makers in order to determine the extent to which investment in improved maintenance should continue.

Designing a Financially Viable System

Component I has been specifically designed to provide the engineering, financial, and micro-economic data necessary to improve the operation of the present rural water maintenance and planning systems. Components II and III will use the results of the survey to provide the basis for personnel training as detailed in the Project Description. When accompanied by the reorientation and decentralization of the personnel structure, this process is expected to allow improved maintenance at little additional recurring cost. Community based volunteers will be expanded from 250 to 500 and receive training to upgrade skills ^{1/}. Thus, increased efficiency will allow increased revenue collection for the revolving funds.

The following table gives summary data on the revolving fund for 1978:

REVOLVING FUND 1978

SOURCE: Ministry of Health

<u>Region</u>	<u>Revenues</u>	<u>Expenditures</u>	<u>(+ difference)</u>
Occidental	\$ 59,719	\$ 38,545	\$ 21,174
Central	46,690	31,670	14,020
Paracentral	27,095	35,700	-8,605
Oriental	18,206	19,246	-1,040
TOTAL	\$151,710	\$125,161	\$ 26,549

For 1978, revenues per beneficiary were \$0.32; expenditures per beneficiary \$0.26; expenditures per system only \$346. This minimal funding level scarcely assures adequate financing of parts and logistics systems. The fact that there is a surplus is indicative of the fact that the present centralized operation and maintenance system is not functioning effectively enough to utilize present funds.

To the extent that revenues withheld for local use are not fully reported, there may be some undercounting of funds. However, preliminary conclusions regarding the inadequate financing of maintenance are clear. At least some practical financing of the marginal costs of increased maintenance can be offset by marginal revenues collected from improved service. Assuming 6 persons per household in beneficiary areas, there

^{1/} Recurring costs may then increase at this level.

36

are 79,000 households. Service charges per household in 1978 were levied at \$1.20/month for a house connection; \$0.40/month for hand pump use; \$0.20/month for public spigot use. A sensitivity analysis for full operation and collection, depending on type of water source, indicates between \$250,000 and \$380,000 could be collected in revenues at present rates. This would provide up to a 150% increase in revenues. There is therefore, considerable margin to improve returns to the system if a cost effective maintenance system can be developed.

Further analysis of the revolving fund budgets and revenue collection at the local level in Component I will provide the Ministry of Health with the information necessary to adjust disbursements from the funds to meet local needs. Maintaining financial viability, while at the same time maximizing economic benefits of a non-financial nature, such as equity considerations through subsidizing the rural poor's access to water, represents a mix of policy issues that can only be addressed as the project progresses. Component I survey data may indicate that increased involvement at the local level and increased financing of maintenance at the regional level will require an increase in expenditures to maintain the system at a level of service and purity required to obtain the desired health benefits. The question to the trade-offs between maintenance standards, rate increases and government subsidies must then be considered. Contractors providing data analysis under Component I will have to keep this design problem clearly in mind.

5. Beneficiaries

Although, this grant provides for a mixture of empirical research, systems design and training, it also provides for direct repair of 10 systems as part of the training process. There are three classes of beneficiaries:

Participant trainees: 500 local maintenance personnel and 386 Ministry of Health personnel will receive training. Costs vary greatly by course so that an average cost per trainee would be meaningless (see Financial Plan).

Direct beneficiaries: The training plan finances the repair of 10 systems as a practical training component during the life of the project. 13,000 rural persons will benefit as discussed in Section II. A.2 at a cost per direct beneficiary of \$53.00 which is the most easily measurable indicator of cost effectiveness at project completion.

Indirect beneficiaries: By the end of the project, the remaining 463,000 of 476,000 present rural population with direct access to potable water will be benefitting from improved preventive maintenance of systems. Components I through III by establishing an on-going remedial/preventive program ultimately benefit the entire rural population receiving water. However, due to the on-going nature of recurring costs required to maintain the system no meaningful costs per indirect beneficiary can be given.

37

B. SOCIAL SOUNDNESS ANALYSIS

Congress, in 1973, redirected its foreign assistance emphasis so as to better provide for the basic human needs of the poor. By so doing, increasing attention has been focused in such sectors as health, water supply and sanitation. At least 10% of all deaths in less developed countries are due to water-related diseases. In the rural areas, diarrheal disease is the underlying cause of more than half of all reported deaths of children under five. Since the resulting loss in productivity due to disease is substantial, one indicator of the need for improvement in water supply is the cost of sickness related to the use of polluted water.

The relationship between good health and potable water is not clear to most of the rural poor. The value of water is fixed daily by tasks. Depending on the amount of work involved in securing water from traditional water sources, users may or not acknowledge the gains to be derived from a nationally-offered water supply system. This Social Soundness Analysis addresses those factors most specific to increased participation in water supply and sanitation systems.

New field work for preparation of this document has been limited. On the basis of that which has already been carried out and other studies on the health sector, however, conclusions can be drawn as to the definition of community participation, community attitudes toward water use, the extent of their participation in the decision-making process, the possibilities of an increased role for the water promoter as a facilitator of community development, and implications of each of these for the maintenance and operation of water supply systems.

1. Definition of Community Participation

The role of the community to date in water supply in rural El Salvador can be more properly termed involvement than participation, and has been limited primarily to the construction phase. Most studies of water and sanitation systems indicate the importance of community participation to their effective functioning especially since behavioral change is involved in their use and maintenance. Such participation seems to be limited, however, by present MOH procedures for design and installation of systems.

Although the MOH/DAR procedure for installation of systems involves a socio-economic survey of the community as a part of a system feasibility study, the survey permits only a narrow range of responses with little provision made for the identification of local preferences as to level of service or financing arrangements. One requirement for an affirmative decision regarding socio-economic feasibility of a project is that

the majority of villagers own their own house and surrounding property. This policy is justified on the basis that home owners are likely to possess a greater desire and capacity to pay for a water system, and particularly for household connections. The justification tends to break down as a criteria for system feasibility, however, since some landowners agree to participate initially and later withdraw for "economic" reasons. The analysis suggests, therefore, that land and home ownership, as criteria for system feasibility, should be further examined for possible modification.

2. Community Attitudes Toward Water Use

Field work carried out in project preparation showed the importance of questions of water quality, as perceived by the community, to effective community use and support of water systems. Moreover, especially significant to local financial support of systems seems to be community perception of costs of water systems and water rights against other variables regarding convenience, taste, odor and appearance. At present, however, decisions regarding user fees are made at the central level based on technology choice, and involve little if any discussions with the community regarding the fee level or the need for fees to provide adequate support for system maintenance. Customers remain ignorant of maintenance requirements and satisfied to withhold user fees and cultivate alternative sources of water rather than to lobby continually for optimally functioning systems.

3. Decision-making

Decisions specific to system design, site-location and cost are made centrally and presented to the community by regional personnel for implementation. Initial interest that accompanied the service application is sustained only to the extent that the community is required to dig trenches and contribute backfill. Local involvement is further expected for fee collection. A community junta is formed, composed of a president, secretary and treasurer, who together, are responsible for local management. If a system is failing they may report it, but turn around time for repairs is usually a month. Improved operation and maintenance should reduce dissatisfaction that accompanies such interruption of service.

The junta selection process varies but the analysis indicated the process is generally representative of the informal leadership of the canton. In such cases the junta could be a means of, not only generating support for the system, but also for providing a forum for informal education on water, health and related development topics.

The limited involvement of communities in water system planning reflects in part the narrow range of technology being used by the DAR in its rural water program (see Background section). Development of a wider range of community specific options at regional and central levels for

presentation to communities could stimulate greater participation. Even when the technology choices are limited, however, greater efforts need to be made to explain the best choice to the community during the design phase, as a means of integrating technology into rather than imposing it upon the community.

4. Role of the Promoter

Assuming the MOH does make increased efforts to foster a larger role for the community in decision making, the water promoters will become more essential to effective functioning of the system. As the intermediary between the community and the regional office, they must be able to argue for and with both. Such a role demands, however, the upgrading of capabilities of both the promoter and the CPAR to analyze the likely impact of a water system on a particular community. Training to this end will enable both to understand the need for greater community participation to increase the effectiveness of water systems and to work toward it.

Given the current authority structure within the health system, however, it is possible that water promoters, even with additional training would in some instances continue to be limited in their community role. Normally a promoter is dispatched to a community after a problem, such as non-collection of revenue, is expressed. In his new capacity, the promoter would not only supervise simple repairs and routine preventive maintenance at the local level but would also demand prompt response from the region for larger repairs. At what point these two responsibilities might bring him into direct conflict with the regional office must be determined. Otherwise job security and not community participation could dominate his actions.

In summary, success in community participation requires that the analytical capabilities of the water promoters be upgraded. Skills in such analysis can be specifically developed under this project in the community development training aspect of the CPAR program. An orientation to such analysis should be taught prior to the execution of the Operations and Maintenance Survey. The orientation would focus on use of a survey instrument to ascertain the existing geo-physical boundaries of each community as well as analysis of both the informal and formal community networks.

The results of the survey, if correlated to system use, condition, and community response to cost, could provide the promoters with new insights into the participation process as well as suggestions for changes in existing community organization and possibly the composition of the juntas. This practicum, followed by additional training in community participation, should provide a basis for change.

40

5. Conclusion as to Social Soundness

The project, as proposed, is socially sound. AID directives for meeting the basic needs of the poorest of the poor will be carried out. Service will be extended to those with per capita incomes less than \$225 per annum, including women, and children under five. However, some policy revision regarding involvement of the community is necessary to maximize the impact of technical improvements and training.

C. TECHNICAL ANALYSIS

1. Water Supply and Project Health Objectives

The direct correlation between improved rural water supply and a corresponding improvement in rural health status has proved difficult to substantiate definitively. This is because the diseases associated with lack of potable water supply are controlled by a variety of additional factors. These diseases, generally classified as waterborne, such as typhoid, cholera, etc., and waterwashed, such as diarrheas caused by intestinal parasites and trachoma, can also be attributed to a lack of sanitary disposal of excreta and household wastes and a general lack of proper hygiene. Thus, it is clear that while the provision of safe water supply is an extremely important component in any effort to control waterborne and waterwashed disease, many of the beneficial effects resulting from the provision of water supply will be negated if appropriate remedial measures attacking the other causative agents are not instituted.

Such reasoning has been the basis for the formulation by many donor agencies of integrated rural environmental projects. Such an integrated approach calls for a project design which addresses as many as possible of the various disease-causing agents. This project has been formulated with full regard to such a philosophy. Although the project focuses largely on matters associated with the physical infrastructure of the rural water supply, a number of specific features have been incorporated to ensure a fully integrated approach by the MOH. Specifically, the community development training which the promoters will receive includes instruction in health education and community organization. It is expected that, as an integral part of their duties, the promoters will educate the communities in which they work in the full range of hygiene and sanitation-related topics necessary to ensure the health benefits of improved water supply. Specifically this will include promotion of and assistance in installation of latrines as a complementary activity to water system construction. Technical training provided to the CPARs will include complete instruction in the design and installation of latrines as well as alternative sanitation technologies. It is encouraging to note that the DAR has recently instituted within its formal regulations the requirement that the installation of all water systems be accompanied

41
by latrine installation. This approach has met with varying degrees of success in each community. Better financing mechanisms and health education activities should be encouraged.

2. Technology Choice

The choice of technology to be used in rural areas of developing countries is an issue of extreme importance. Since the successful utilization of a water supply technology depends upon its acceptability to the community and the community's capability to meet the associated financial and operation and maintenance responsibilities, the choice of technology will influence the project's success or failure.

Examination of the DAR's mix of technology utilized in rural systems installed over the past 20 years indicates a diverse group of implemented technologies, including simple hand pumps, spring-fed gravity systems, and deep well, submersible electric pump systems. In recent years, however, the DAR has had a decided bias towards installation of deep well submersible electric pump systems claiming that the only available water sources remaining in El Salvador are aquifers which range in depth from 75 to 300 feet. The systems constructed often serve more than one community and are sometimes built for as many as 10,000 people. According to DAR officials these large distribution networks with high volume deep well sources provide the most cost-effective way of supplying water to large numbers of people. In addition, recent DAR policy also calls for the provision of house connections whenever possible due to economic efficiency.

It is difficult to confirm or refute these claims based on the technical assessment conducted as part of the project preparation. However, substantial evidence is available which indicates that there may be possible alternative technology choices, provided that lower volume systems were designed and installed. There are many shallow aquifers which possibly could provide smaller yields, and the potential exists for added utilization of springs through lateral drilling and other techniques of spring enhancement. The use of less sophisticated systems, the possibility of which is provided by these alternative sources, might reduce the high cost and operation and maintenance problems now associated with the larger systems.

DAR officials have proven to be quite open to new ideas and have requested USAID assistance to develop some appropriate technology designs for rural El Salvador. In response, as a part of this grant AID has agreed to review technological options applicable to rural El Salvador and to design five to ten systems for specific communities now lacking water supply. These efforts which coincide with UNDP activity in the sector will be constructed under the UNDP project. Such prototype water systems should be important to the eventual adoption of a wider range of technologies once their viability is proven.

3. Operation and Maintenance

By directly addressing the operation and maintenance of rural water supply systems, the project attacks one of the most prevalent technical problems associated with the provision of safe water to the rural poor of El Salvador or, for that matter, to the entire developing world. Technology is frequently supplied to recipient countries without providing the concomitant capability to effectively maintain and operate that technology. At present in El Salvador substantial financial resources have been or will be made available by other donors for the capital cost associated with the implementation of rural water supply systems. At the same time, however, development of an operation and maintenance capability within El Salvador is lacking. This has already been identified in the Background Section under "Inadequate Operation and Maintenance" on page 7.

The comprehensive O&M plan which will be developed under Component I will address the widest possible range of DAR activities, especially those aspects of operation and maintenance most problematic in the developing country context, such as the issues of technology choice and standardization of design, capability for local manufacture of equipment, maintenance of an adequate parts inventory, and skilled manpower. An assessment of the communities' ability to maintain systems is extremely important since there is significant evidence which indicates that a lack of community interest frequently is the source of many operational maintenance problems (see Clemens: Operation and Maintenance of Rural Water Supply Projects of MOH/El Salvador).

Thus, the O&M plan which is developed from the above analysis, will specify a detailed schedule of maintenance to guide all levels of the DAR in the performance of preventive and remedial maintenance. Emphasizing preventive maintenance in this manner offers the most cost-effective approach to O&M since it reduces the severity of repairs, greatly extends the useful life of the expensive capital goods associated with the systems in El Salvador (i.e., pumps, motor, tank, etc.) and allows for the most efficient allocation of DAR manpower. Moreover, such an approach should enhance the long-term community satisfaction with the system by ending periods of reduced or completely eliminated service. The plans and materials developed for the program require the development of simply stated manuals explaining (a) the various procedures, both technical and administrative, required under the plan; (b) clear identification of the skills necessary for the performance of those roles; and (c) the design of training curriculum to provide those skills.

43

D. ADMINISTRATIVE FEASIBILITY

1. GOES

a. Organizational Structure (Current)

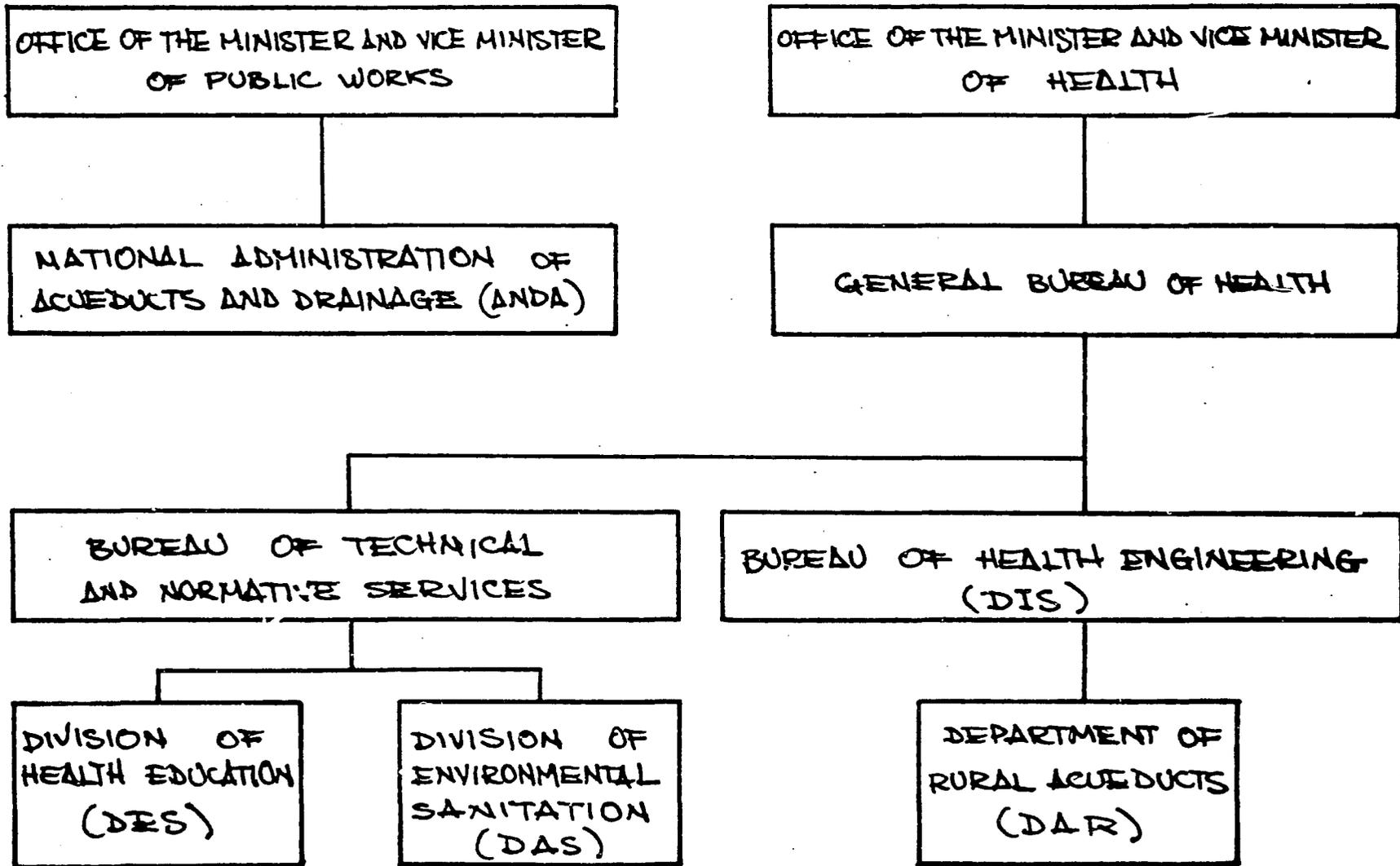
There are two principal organizations within the GOES involved in rural environmental sanitation: The National Administration of Water Supply and Drainage (ANDA), a semiautonomous agency, under the Ministry of Public Works, responsible for urban water supply; and the Ministry of Health, responsible for rural water supply. Within the latter, the Rural Water Supply Department (DAR) of the Bureau of Health Engineering has primary responsibility for implementing rural water supply projects. The Department at least theoretically coordinates its activities with those of two other MOH offices involved in rural environmental sanitation; namely the Division of Environmental Sanitation (DSA), responsible for installation of latrines; and the Division of Health Education (DES). The organizational relationship of these entities is shown on the following chart, and their independent and overlapping responsibilities described in the Administrative Information Annex.

The Ministry of Health and specifically the DAR was assigned responsibility for rural water supply in 1972 when, as discussed in the Annex, ANDA officially delegated its authority for rural water supply and all rural water personnel to the Ministry. The DAR and DSA provide centralized management and technical support for the planning, execution, operation and maintenance of rural water supply and sanitation programs. Many of the more immediate operational responsibilities for rural water supply are, however, delegated to the four Regional health offices as explained further in the Administrative Information Annex.

b. Organizational Structure (Future)

As a result of the training courses conducted as part of this project, several changes will be made in DAR staffing. (Administrative Information Annex details present and possible future DAR staffing and organizational structure). Four electricians and their crews, who are presently centrally located in San Salvador will be reassigned to each of the four MOH regional offices and their salary increased as a result of the training and relocation. The rural water promoters who complete the CPAR training course (in approximately 2 years) will receive their new title and an accompanying salary increase when they assume the new responsibilities which will be determined by the task analysis process described in the Administrative Information Annex. These responsibilities include execution of preliminary duties, the supervision of rural water systems construction, community participation, and installation of latrines and of operation and maintenance activities. These changes will be incorporated in the project agreement as conditions precedent to additional disbursement during the last year (FY 82).

MUH ORGANIZATIONAL CHART



4/1

45

c. Other Resources: Transportation

DAR's equipment for its work is generally adequate. A fundamental organizational problem in the past, however, a lack of vehicles, is to be resolved shortly when 16 jeeps (8 purchased with IDB funds and 8 with regular Ministry funds) are made available directly to DAR personnel at both central and regional levels. In addition 8 other vehicles have been programmed under a CIDA project. As a condition precedent to disbursement the Ministry will be asked to provide evidence that these vehicles will be specifically assigned to DAR personnel to carry-out the operation and maintenance survey as well as the studies under the project Component IV. Moreover, vehicles which will be needed for practical field work associated with all training courses must be assured by the MOH.

2. Training Institutions

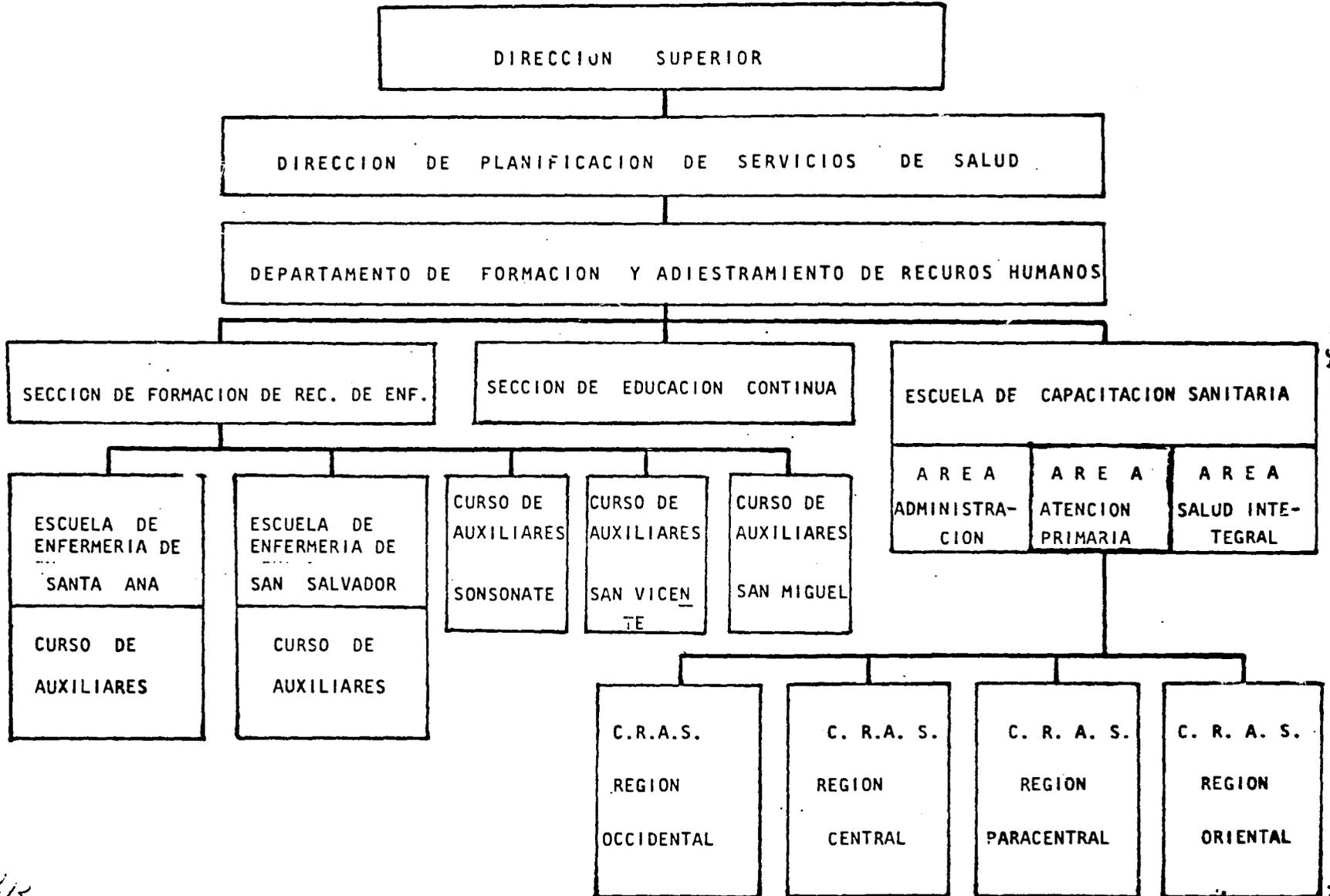
Project Components II (Operations and Maintenance) and III (CPAR Program) call for the training of some of the engineering staff and all of the mid-level and lower-echelon Ministry of Health/DAR personnel. An analysis of the possible training institutions was carried out to determine the most appropriate arrangements for conducting training for each of these components.

The National Health Training School (Escuela de Capacitación Sanitaria) of the MOH Human Resources Development and Training Department (see Organizational Chart) is responsible for conducting training courses both within the central level school in San Salvador as well as in four regional training centers. The school has designed curricula and conducted courses for rural health aides, rural health supervisors, sanitary inspectors, social workers, nurses and other MOH personnel. Since the School has been responsible for carrying out many AID-funded family planning courses its faculty has the advantage of previous experience with AID grant administration.

The School possesses the physical facilities as well as administrative personnel (11 instructors including sanitary inspectors, water promoters, health educators, and social workers) and the basic teaching experience needed to program and implement the majority of the socio-cultural aspects of the training components. The School, recognizes its limitations, however, in facilities and teaching competency to carry-out instruction in technical subjects and has requested that technical assistance be programmed in this area under the grant.

In the case of CPAR component, arrangements are underway to coordinate training at the National Health Training School with course work at ITCA, the "Instituto Técnico de Centroamérica" (Central American Technical Institute). ITCA was founded in 1970 by the Ministry of Education and the Government of Great Britain to address the need for engineering and agricultural technicians. Entrance requirements include a Ministry of Education certified high school equivalency diploma, and a passing grade on an ITCA administered entrance exam. At present, majors offered include electrical, civil and construction, mechanical, and agricultural engineering; and sciences, each

ORGANIGRAMA DEL DEPTO. DE FORMACION Y ADIESTRAMIENTO DE RECURSOS HUMANOS
MINISTERIO DE SALUD PUBLICA Y ASISTENCIA SOCIAL
EL SALVADOR



- 34 -

413

requiring two years of study for certification. An integral feature of ITCA's pedagogical methodology is the utilization of a combination of classroom, laboratory and field work training for each subject.

Both the DAR director and the potential students themselves, the presently employed MOH rural water promoters, have expressed their strong desire to utilize ITCA for technical training for the CPAR component. Discussions have taken place with ITCA directors to determine satisfactory arrangements for both ITCA and the DAR regarding this training. ITCA classrooms, hydraulic and materials laboratories, and teachers will be available beginning in February 1980, during the afternoon session from two to eight p.m. Under the contemplated arrangement ITCA professors will be used for appropriate class work and all laboratory studies, but outside instructors will be contracted to supplement ITCA staff teaching for some technical courses and to supervise the practical field training. These needs will be met through a contract for technical assistance funded as a part of the project.

The director of ITCA has demonstrated flexibility with regard to programming coursework, which under the project implementation plan is scheduled to begin in May 1980, the start of the rainy season (which lasts each year from May until November) when the water promoters' workload diminishes. Present plans are to hold the first half of the training course during May-September 1980 (FY 80), and the second half the following May-September 1981 (FY 81), in order to allow the water promoters to participate in other project and regular work activities. This time frame, to which ITCA has consented, allows inputs into the curriculum of the second year from the results of the operation and maintenance survey of the first component and possibly from the appropriate technology system designs of the fourth component.

Under the grant USAID will fund external costs of ITCA professors who assume teaching duties above the normal load and the teaching materials used in laboratories and in classrooms.

Both the Chief of DAR and the Director of Human Resources Department have investigated the proper procedures necessary to institute the combined program which will be administered by the National Health Training School. Signature of a formal agreement between the Ministry of Health and the Ministry of Education (ITCA is under the auspices of Dirección Superior (Higher Education) of the Ministry of Education) will be a condition precedent to disbursement of funds (see C.P. VII A3). This action, however, is seen only as a routine bureaucratic procedure as the key personnel involved have already informally approved the arrangement. The ITCA Director indicated that the Ministry of Education would most likely make classroom space available to the Ministry of Health at no charge.

In spite of the lack of technical expertise in teaching rural water supply operation and maintenance, the National Health Training School has

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demonstrated its ability to carry out task analysis and subsequent course development and instruction for health technicians and MOH auxiliary personnel. The DAR and the Human Resources Department have each named representatives to a committee which will be in charge of the training program development. This committee will be provided appropriate external technical assistance (under Component I, Operation and Maintenance Survey and Analysis) to assist with task analysis, curriculum design and development.

3. Project Administration

a. GOES Ministry of Health

On the basis of USAID's analysis of the administrative requirements of the project and MOH capabilities, it has been determined that the MOH/DAR will be responsible for direct administration of the Project. Another possible course, assignment of a project-funded administrator to the DAR, was determined to be wasteful in view of the recent assignment to the MOH of a UNDP administrator/engineer with responsibility for coordination of other donor assistance and technical advice in overall policy and organizational matters in water and sanitation. In discussions held with UNDP and Ministry representatives it has been agreed that the UNDP engineer will informally assist the Ministry and USAID in implementation of this project. Key areas in which such assistance is required include the contracting for technical assistance described below and the project monitoring/evaluation system involving collection, analysis and presentation of input, cost and output data.

As shown in the project description and implementation plan, a substantial amount of technical assistance to the MOH and ITCA is required under all project components. Host country contracting of such assistance on an individual basis, in the USAID's experience, has proved costly in terms of time to both the Mission and GOES and generally a constraint to effective project implementation. It has been determined, therefore, that a maximum of three technical assistance contracts should be let to international consultant firms for purchase of both technical assistance and in-house management capabilities for those components.

The first of these contracts (draft scopes of work are included in the Contract Annex) would provide technical assistance for (a) the operation and maintenance survey; (b) the analysis and subsequent development of an operation and maintenance plan and a training program for DAR personnel; and (c) implementation of the above training program in cooperation with the National Health Training School (Escuela de Capacitación). It is contemplated that sub-contracting will be provided for hiring of additional specialists (possibly Salvadorean) to assist in the training and supervision required.

The second contract will provide technical assistance in the area of curriculum development and instruction for the CPAR training program

49
to ITCA and the National Health Training School. It is essential that coordination between this firm and the other previously mentioned firm be maintained in order to coordinate the CPAR training in operation and maintenance. To this end, the possibility of using a single contract to fill both needs should be considered.

The third contract will provide technical assistance from an international engineering firm that has demonstrated ability to design and construct rural water systems using innovative appropriate technologies. The firm will be responsible for supervising the feasibility study of 50 communities, and the selection and design of five to ten water systems which have been approved by the DAR chief. The exact number of experts and time required to complete the 46 weeks activity will be left flexible to meet the specific requirements of El Salvador as they are determined by the feasibility study.

In carrying out its responsibilities under the project, the MOH/DAR will receive administrative support from the MOH Division of Administration, and technical support as described above from the National Health Training School of the MOH Department of Human Resources.

b. USAID

Although a Project Manager from the Health Population and Nutrition Division is assigned primary responsibility for assuring adequate project monitoring and backstopping, a Joint USAID/MOH Project Committee will meet regularly to monitor progress and discuss implementation issues. This committee will also be responsible for completion or review of quarterly reports and yearly evaluations of the project as described in the Evaluation Plan.

In addition to the Project Manager, USAID committee members will include the Rural Development Officer, the Economics Officer and the USAID Engineer and other staff as required.

50

IV. FINANCIAL ANALYSIS

A. The total financial investment envisioned by this Grant and the GOES contribution to it totals nearly \$900,000. The required contribution of the GOES to the project is based on costs of supplies, materials and personnel needed to repair 10 water systems under the O&M Training Component (\$80,000), 8 jeeps and the jeep operating costs (\$88,000) in support of all project components, and the employment of two new electricians and their crews in CY 82 (\$7,440).

In addition the GOES is providing a substantial amount of administrative and logistical support to the project at both central and regional levels as well as specific survey and design support under Components I and IV. The GOES has also agreed to augment the salaries of the CPARs after the completion of their training, a further contribution to the project in the third year of implementation (see Recurrent Costs and VII B1).

B. FINANCIAL PLAN

PROJECTION OF EXPENDITURES BY FISCAL YEAR

(US \$ 000)

PROJECT PAPER

PROJECT NO. 519-0209

TITLE: RURAL WATER SUPPLY AND SANITATION

FISCAL YEAR	AID	HOST COUNTRY	TOTAL
1980	45	116	161
1981	256	153	409
1982	122	147	269
Inflation Factor	51		51
Contingency	6		6
TOTAL	480	416	896

SUMMARY COST ESTIMATE AND FINANCIAL PLAN

(US \$ 000)

PROJECT PAPER

PROJECT No. 519-0209

TITLE: RURAL WATER SUPPLY AND SANITATION

SOURCE	A.I.D.		HOST COUNTRY		TOTAL
	FX	IC	FX	IC	
Technical Assistance	238				238
Training		96		5	101
Commodities	50	32		140	222
Other Costs		7			7
Salaries				85	85
Administrative Costs				147	147
Inflation Factor	51			39	90
Contingency	6				6
TOTAL	345	135		416	896

5

COSTING OF PROJECT OUTPUTS/INPUTS

(In \$000 or equivalent)

Project Paper

New

Rev. # _____

Project No. 519-0209

Title: Rural Water Supply and Sanitation

PROJECT INPUTS	PROJECT OUTPUTS*				TOTAL
	# 1	# 2	# 3	# 4	
AID Appropriated					
Technical Assistance	87	67	37	76	267
Local Training	3	47	57	-	107
Commodities	1	78	10	2	91
Other Costs	6	2	4	3	15
TOTAL A. I. D.	97	194	108	81	480
Host Country					
Salaries	13	35	46	6	100
Commodities	15	108	15	15	153
Administrative Costs	46	34	47	36	163
TOTAL HOST COUNTRY	74	177	108	57	416
TOTAL	171	371	218	138	896

* Correspond to Component I-VI

A detailed budget of expenditures for each Component is provided in Annex IV.

53
C. RECURRING AND REPLICATION COSTS

The Economic Analysis discusses the project emphasis on making current spending in the area of rural water and sanitation more effective rather than increasing allotments to it at present. Therefore definitive recurrent costs generated by the project are expected to be minimal and to consist primarily of the following:

1. salary increases for the trained CPARs--an estimated \$360 per year or a total of \$5,400 in CY 83;
2. estimated salaries for 2 additional electricians and salary increases for 3 others who relocate to regional centers--total \$7,440 in CY 82.

It is realistic and desirable, however, to anticipate additional recurring expenses will be engendered by certain project activities. The preventive and corrective program developed as a result of the Operations and Maintenance Survey will undoubtedly result in increased requirements for spending in that area. Although some of these can probably be absorbed through reallocation of anticipated MOH funding, or more effective community tariff collection, it is likely that some additional budgeting in this area will be recommended.

Secondly, although at present it is planned that only 30 CPARs will be trained, including 15 under this project and another 15 with UNDP assistance, it is realistic to assume that to meet normal attrition needs and increasing demand generated by expanding water supply and increased maintenance, additional CPAR classes and posts and hence additional funding, for these intermediate technicians will be required within a five year period.

V. IMPLEMENTATION PLAN

A. IMPLEMENTATION AND MONITORING RESPONSIBILITIES

Project implementation will be the responsibility of the Ministry of Health and specifically that of the Department of Rural Water Supply of the Bureau of Health Engineering, as discussed in Section IV, Administrative Feasibility. Immediate responsibility for project monitoring and backstopping will be assigned to a USAID Project Manager from the Health/Population/Nutrition Division. As described in the Administrative Feasibility and Evaluation sections, a Joint MOH/USAID Project Implementation Committee is expected to meet quarterly to review progress, complete quarterly reports on progress and problems, and carry out annual evaluations.

1. Disbursements for Local Currency

The USAID will make disbursements directly to the Grantee in order to reimburse it for expenditures made to cover project costs in accordance with the illustrative budget, and previous USAID approvals for the goods and services procured.

In order for the Grantee to obtain reimbursement for project-related expenditures, the Grantee shall submit in form and substance satisfactory to the USAID a request for reimbursement, copies of suppliers' invoices, copies of vouchers, and a certification as to the authenticity of the documents presented. The Grantee shall forward the request to the Health Population and Nutrition Division which in turn will transmit them to the Office of the Controller, USAID.

2. Disbursements for Foreign Exchange Dollar Costs

The Grantee may request USAID to act as its purchasing agent for dollar related goods and services. To this end, USAID will make the necessary arrangements to pay for US supplies through A.I.D.'s standard procedures.

The Grantee may purchase goods and services with its own Foreign Exchange, and the USAID will reimburse the Grantee from US owned local currency for those project related costs that were previously approved by USAID and conform with the terms and conditions of the illustrative budget.

In order to obtain reimbursement, Grantee shall submit in form and substance satisfactory to USAID a request for reimbursement, copies of supplier's invoices, copies of vouchers, and a certification as to the authenticity of the documents presented. The Grantee shall forward the request to the Office of the Controller, USAID.

55

3. Procurement Procedures

The source and origin of the technical assistance and commodities procured with A.I.D. grant funds will be the U.S. Geographic Code 000. Source and origin for materials, supplies, and other costs will be the U.S. and El Salvador (including the Central American Common Market countries). All procurement will take place in accordance with standard A.I.D. procedures as defined in the AID Handbooks, and be subject to prior written approval by the USAID.

B. IMPLEMENTATION SCHEDULE

In developing the project implementation plan consideration was given to the seasonal variations in weather, the work responsibilities of DAR personnel participating in training courses and to the interrelation of project activities under the four separate components.

All survey work included under Components I and IV will be carried-out during the dry season months -- November to May. This is essential because roads are often impassable during the rainy season making site visits difficult to complete, and because measurements of water sources, which vary throughout the year, are more reliable (usually lower) during the dry season.

The work responsibilities of the DAR staff also vary according to the seasons. During the dry months water promoters focus on community promotion activities directly related to water system construction, securing the needed labor to build the water systems. Preliminary investigations of potential projects must also be carried out during this period for the reasons mentioned earlier with regard to the surveys. The rainy-season -- from May to October -- has been identified as the most opportune time to conduct training courses for DAR staff due to the lighter workload. CPAR training therefore, has been scheduled in two parts, one to begin in May 1980, to continue to September and the other to take place at the same time the following year (May-September, 1981). This schedule allows time for further curriculum development between October 1979, and April 1980.

The Operation and Maintenance Survey of Component I will be carried-out beginning in October 1980. It was scheduled as such to coincide with the dry season and to allow sufficient time to contract technical assistance, organize the survey schedule, pre-test and refine survey instruments, and train the water promoters who will conduct the survey. (These will include those water promoters enrolled in the CPAR course). Compilation and analysis of the survey data will begin as soon as possible so that a plan can be developed and presented to the DAR for adoption during the rainy season -- May-November, 1981.

56

It is planned that the results of the survey will be used to design the curricula for courses for DAR O&M personnel and will be the basis for CPAR instruction in the same area. The second year CPAR training, May-September 1981, will include instruction in not only O&M procedures, but also in design and construction of water systems using the appropriate technologies developed under Component IV.

Because the project plans to make use of the CPARs as instructors for the O&M training of lower-level, community-based operators, the CPAR course will include training in teaching of the subject. In fact, community-based operator courses will begin during the last months of CPAR classroom work and will be taught by the CPARs. This will be a supervised student teaching exercise to insure instructor proficiency.

51

MOH - Ministry of Health
 DAR - Rural Water Supply Department
 ECS - National Health Training School

Related Component # or Admins. (A)	DESCRIPTION	DATES ON WHICH EVENTS ARE TO OCCUR	RESPONSIBILITY
A	1. GOES/USAID Project Agreement signed	September 28, 1979	USAID/GOES
A	2. Conditions Precedent to Disbursement met	November 1979	GOES/MOH
I, II, III	3. Technical Assistance Contract bid specifications completed for Components I, II, III	October - December 1979	MOH/DAR and USAID
III	4. Preparation for CPAR instruction, by subject, in-house	October 1979 - March 1980	USAID and MOH/DAR/ECS
I, II, III	5. Technical Assistance Bids received for components I, II, III	January - February 15, 1980	MOH/DAR
I, II, III	6. Bids reviewed and contracts negotiated, approved by USAID and awarded	February - March 15, 1980	MOH and USAID
I	7. Initial course and program preparation, by contractor, for operation and maintenance survey and analysis	March 15 - July 1980	MOH/DAR/ECS

III	8. Course preparation, by contractor, for CPARs	March 15 - May 1980	MOH/DAR/ECS
III	9. Training initiated (Part I) for 15 CPARs (includes field work)	May - September 1980	MOH/DAR/ECS
IV	10. Technical Assistance bid specifications completed for Appropriate Technology Study (Component IV) and approved by USAID	June 1980	MOH/DAR
I	11. Training program initiated for 15 water promoters; includes technical and community development training for operation and maintenance survey	August - September 1980	MOH/DAR/ECS
I	12. Operation and maintenance survey schedule organized	August - October 1980	MOH/DAR
IV	13. Component IV bids received, contracts negotiated, approved by USAID and awarded	August 1980	MOH/DAR and USAID

53-

58

57

A	14. First joint MOH/USAID Evaluation and PES preparation	October 1980	Joint Project Committee
IV	15. Appropriate Technologies Study initiated	October 1980	MOH/DAR
I	16. Operation and Maintenance Survey implemented	November 1980 - August 1981	MOH/DAR
III	17. CPAR Training Practicums (dry season)	November 1980 - May 1981	MOH/DAR/ECS
IV	18. Data from regional office specific to 800 applications assembled and categorized	November 1980	MOH
IV	19. 800 Applications reviewed	November - December 1980	MOH/DAR
IV	20. 50 sites selected for detailed investigation	December - January 1981	MOH/DAR
IV	21. On-site investigation of 50 sites carried out	January - March 1981	MOH/DAR
IV	22. Selection and design of 5-10 appropriate technologies	April - June 1981	MOH/DAR

II	23. Curriculums designed for O&M courses	April - September 1981	MOH/DAR/ECS
II	24. Operation and maintenance training initiated for community level personnel	September 1981-September 1982	MOH/DAR/ECS
IV	25. Appropriate Technology study completed with planning recommendations	April - August 1981	MOH/DAR
III	26. Training initiated (Part II) for CPARs.	May - September 1981	MOH/DAR
I	27. Tabulation and mapping of operation and maintenance survey information	July - September 1981	MOH/DAR
A	28. Second Joint MOH/USAID Evaluation and PES preparation	October 1981	Joint Project Committee
I	29. O&M Analysis and report recommending comprehensive maintenance program for DAR presented	August 1981 - December 1981	MOH/DAR
II	30. Electrician, plumbing and pump specialty training	August 1981 - April 1982	MOH/DAR/ECS
III	31. Training practicums for CPARs (dry season)	December 1981 - April 1982	MOH/DAR/ECS

IMPLEMENTATION PLAN

(for your convenience pages 49-A and 49-B have been reproduced on facing pages)

IMPLEMENTATION PLAN

COMPONENT I

1. TA Bid Specification completed
2. Bids received
3. Bid Let and Contract signed
4. Survey Preparation
5. Training - 30 promoters
6. Survey Schedule Organization
7. Survey of 464 communities carried out
8. Tabulation of survey information
9. Mapping of survey information
10. Analysis and report completed
11. Program presented to DAR

COMPONENT II

12. Training courses - electrical technicians, plumbers, pump operators
13. Training courses - community-based operators

COMPONENT III

14. TA Bid Specification completed
15. Bids Received
16. Bid Let and Contract signed
17. Community development courses - 30 promoters for six weeks
18. CPAR classroom training
19. CPAR field work

COMPONENT IV

20. TA bid Specification completed
21. Bids received
22. Bid Let and Contract signed
23. Study and selection of appropriate technologies
24. Categorization of 800 applications
25. Selection of 50 for detailed investigation
26. Field Study of 50 sites
27. Selection and design of 5-10 appropriate technologies
28. Report of application of Ap. Tech. designs to remaining applications

COMPONENT I OPERATION AND MAINTENANCE SURVEY
COMPONENT II LOCAL OPERATIONS AND MAINTENANCE TRAINING AND PRACTICUMS
COMPONENT III MID-LEVEL TECHNICIAN/PROMOTER TRAINING
COMPONENT IV APPROPRIATE TECHNOLOGY DESIGN

5

64

VI. EVALUATION PLAN

The Project will be monitored continually during implementation through quarterly joint MOH/USAID reviews of implementation status. These reviews will consider progress in implementation against benchmarks set forth on the following pages. Twice during the project implementation period full project evaluations will be held as scheduled in the Implementation Plan to review progress toward accomplishment of overall project objectives. A general plan for these in-depth evaluations including essential data to be gathered, means and timing of their collection and the analysis plan will be developed by the Joint MOH/USAID Project Implementation Committee within 90 days of the signature of the Project Agreement. (See Section VII, Special Covenants). At a minimum this plan will specify baseline, input and output data needed to measure project impact on the following indicators; numbers of beneficiaries served by improved water and sanitation facilities; degree of community participation in construction and operation of such systems; and effectiveness of training programs with special emphasis on the CPAR program. The plan will be developed in a manner that progress in these areas can be measured at intermediate periods in project implementation and the results can serve as the basis for the in-depth project reviews discussed above. (Although it is expected that the contractors for Components I and II and for Component III will be responsible for development of detailed evaluation plans for those components, the general plan will provide essential input for the bid specifications and ensuing work scopes for the contracts.)

Finally, in view of the rehabilitative nature of this approach to improvement of access to rural water and sanitation facilities, USAID plans a post-hoc evaluation of certain aspects of the project to take place within one year of project completion. Tentative plans for this evaluation, to be centrally funded will include (a) a comparison of operational capacity of different types of systems repaired or constructed using assistance of project trained personnel with that of a control group of projects included in the original O&M Survey; (b) an assessment of the degree and effectiveness of community participation in both the control and test projects; and (c) an evaluation of skills, both technical and promotional, of the CPARs as demonstrated in the test areas.

PROGRESS BENCHMARKS

- | | |
|---|------------|
| 1. Bids let and contracts completed by DAR for Component III | March 1980 |
| 2. Bids let and contracts completed by DAR for Components I and II | April 1980 |
| 3. Operation and Maintenance Survey and program design and analysis initiated | April 1980 |

64

4. CPAR Course designed April 1980
5. 15 CPARs begin training May 1980
6. Bids let and contracts completed for Component IV June 1980
7. Course design planned and curriculum prepared for field workers for O&M survey June 1980
8. 15 CPARs complete first training session September 1980
9. Technical studies completed for 50 possible Alternate Technology sites March 1981
10. 15 CPARs completed dry season practicum April 1981
11. Curriculum for O&M training designed April 1981
12. 15 CPARs begin second session of CPAR training courses May 1981
13. AT design for 5-10 sites completed and presented to MOH June 1981
14. O&M survey of 464 communities completed July 1981
15. Curriculum prepared for electricians, plumbers and pump operators courses July 1981
16. O&M survey data tabulated and mapped September 1981
17. O&M maintenance plan presented to DAR December 1981
18. 16 Electricians, 20 plumbers, and 120 pump operators trained April 1982
19. 15 CPARs complete training April 1982
20. 500 community level personnel trained in O&M September 1982

End of Project Status

1. 500 Community workers performing routine maintenance on 464 water systems
2. 120 pump operators conducting preventive maintenance on electrical pumps and taking care of routine repairs

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3. 20 plumbers plumbing (more effectively)
4. 15 CPARs supervising water system and latrine construction activities among other promoter's duties
5. 16 electrical technicians located in regional offices performing preventive and corrective maintenance on electrical submersible pumps
6. Accurate data available on actual operation of all DAR water systems
7. Decrease in number and length of water systems breakdowns
8. A solvent rotating fund in operation
9. Construction initiated on AT water system projects

6/7/84

VII. CONDITIONS, COVENANTS AND NEGOTIATING STATUS

A. To assure successful implementation of the project, USAID has determined that the following conditions must be met prior to the disbursement of funds under the project:

1. a statement of the name of the person holding or acting in the office of the Grantee and of any additional representatives, together with a specimen signature of each person specified in such statement;

2. evidence that the Ministry of Health has assigned eight (8) vehicles, two to each of the four health regions, for use in implementation and general backstopping of the project;

3. documentation of an inter-ministerial agreement between the Ministries of Health and Education regarding the use of facilities and instructors of ITCA (Instituto Tecnológico Centroamericano) for training of 15 CPARs (Constructor/Promotor en Acueductos Rurales) under Component III.

B. To assure continuing impact from the project, USAID recommends the following as conditions precedent to disbursement after January 1, 1981: that the Ministry of Health provide a policy statement and accompanying time phased plan regarding the following:

1. the upgrading of 15 rural water promoter positions to the level of CPAR, with accompanying salary increases, for those rural water promoters who successfully complete the CPAR training program;

2. the relocation of four electrical technicians and their crews from San Salvador to each region with accompanying salary increases, upon completion of their operation and maintenance training program;

3. the replacement of the 15 rural water promoters who will become CPARs; and

4. the earmarking of necessary funds (\$80,000) to repair ten (10) rural water systems under Component II.

C. A special covenant under the grant will insure that a general evaluation plan for the project has been completed by the Joint Project Implementation Committee and approved by USAID. This plan will specify baseline data and indicators for measurement of project impact -- technical, social, economic -- and cost-effectiveness, of interventions, as well as the timing and procedures for collection and analysis of this information.

69

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DEPARTMENT OF STATE

ANNEX I ^{PH}

TELEGRAM

INCOMING SAN SALVADOR

CONTROL: 8413
DPO/PH

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TACS:

SUBJECT: PID REVIEW - RURAL WATER SUPPLY AND SANITATION PROJECT

15-8

1. THE SUBJECT PID WAS REVIEWED AND APPROVED ON AUGUST 1 1979. MISSION IS AUTHORIZED TO PROCEED WITH PROJECT DEVELOPMENT AND TO APPROVE THE FINAL PP. THE FOLLOWING COMMENTS AND SUGGESTIONS ARE PROVIDED TO ASSIST THE MISSION IN PREPARING THE PP.

2. PROJECT STRATEGY: ALTHOUGH RECOGNIZING THAT THE LACK TRAINED PERSONNEL CONTRIBUTES TO THE POOR MAINTENANCE OF EXISTING WATER SUPPLY SYSTEMS, THE MISSION SHOULD ALSO LOOK AT OTHER FACTORS WHICH MIGHT BE OF EQUAL IMPORTANCE. PARTICULAR ATTENTION SHOULD BE GIVEN TO THE DEGREE OF COMMUNITY INTEREST IN MAINTAINING SYSTEMS, AND WHETHER ADEQUATE INCENTIVES EXIST FOR THEM TO INVEST TIME AND ENERGY IN MAINTENANCE ACTIVITIES. IN SIMPLE TERMS, WILL THE PRESENCE OF TRAINED PEOPLE MAKE A DIFFERENCE, OR DO WE NEED TO CONSIDER COMPLEMENTARY ACTIVITIES WHICH WILL INCREASE COMMUNITY INTEREST IN MAINTENANCE -- E.G., COMMUNITY OR INDIVIDUALLY OWNED SYSTEMS WHICH, IF PROPERLY MAINTAINED, GENERATE INCOME FOR THEIR OWNERS? IN ANALYZING COMMUNITY INTEREST, THE MISSION SHOULD TRY TO DETERMINE THE DEGREE

TO WHICH MONTHLY INSTALLATION AND MAINTENANCE MAY REDUCE THE COMMUNITY'S SENSE OF RESPONSIBILITY. THE MISSION SHOULD ALSO CONSIDER THE LIKELY IMPACT OF LOCALLY AVAILABLE RESOURCES AND FINANCING ON THE OPERATION AND MAINTENANCE OF WATER SYSTEMS. THE COST OF OPERATING AND MAINTAINING THE SYSTEMS AND THEIR GENERAL LEVEL OF SOPHISTICATION ARE ALSO IMPORTANT FACTORS WHICH SHOULD BE CONSIDERED.

WE RECOGNIZE THAT MANY OF THESE STRATEGY QUESTIONS CANNOT BE COMPLETELY ANSWERED PRIOR TO PP COMPLETION. THEREFORE, WE SUGGEST THAT THE MISSION TRY TO BUILD THEM INTO THE SURVEY OF EXISTING SYSTEMS AND THE PROJECT EVALUATION PLAN. THE RESULTS OF BOTH COULD THEN, WE FEEL, BE EXTREMELY USEFUL TO THE USAID, AS WELL AS OTHER DONORS, IN

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DESIGNING AND IMPLEMENTING FUTURE POTABLE WATER PROGRAMS. MORE SPECIFICALLY, WE SUGGEST THAT THE O AND M SURVEY BE EXPANDED TO INCLUDE ANALYSIS OF THE FINANCING PROBLEMS OUTLINED IN THE PID, AS WELL AS THE COMMUNITY'S PERCEIVED RESPONSIBILITY FOR MAINTENANCE AND THE TECHNICAL QUESTIONS ALREADY OUTLINED IN THE PID.

3. ROLES OF COMMUNITIES AND VOLUNTEERS: THE PP SHOULD DISCUSS IN SOME DETAIL THE WAYS IN WHICH COMMUNITY PARTICIPATION WILL BE INCREASED, THE KINDS OF LOCAL ORGANIZATIONS WHICH WILL BE USED, AND THE ROLES OF VOLUNTEERS AND THE TASKS WHICH THEY WILL BE EXPECTED TO PERFORM. ALSO, BECAUSE OF THE MIXED EXPERIENCE IN EL SALVADOR WITH MALARIA PROGRAM VOLUNTEERS, THE MISSION IS ENCOURAGED TO CRITICALLY EXAMINE THE FEASIBILITY OF EFFECTIVELY USING VOLUNTEERS IN THE MANNER ENVISIONED, INCLUDING THE POSSIBLE NEED TO PAY "VOLUNTEERS."

4. ROLES OF ITARS: BECAUSE OF POTENTIAL OVERLAP IN THE FUNCTIONS OF ITARS AND SANITATION INSPECTORS, THE PP SHOULD CLEARLY DEMONSTRATE WHY THE NEW ITAR POSITIONS, OR PROMOTERS IN GENERAL, ARE NEEDED. ONCE NEED IS ESTABLISHED, THE PP SHOULD DISCUSS THE ROLES OF ITARS IN SOME DETAIL, INCLUDING THEIR RELATIONSHIP TO OTHER OFFICIALS IN THE MOH, TO COMMUNITY VOLUNTEERS, AND TO SANITATION INSPECTORS. WE ALSO SUGGEST THAT YOU LOOK CAREFULLY AT WHETHER ITARS SHOULD BE EXPECTED TO PLAY THE BROAD ROLE ANTICIPATED FOR THEM -- I.E., FROM FIXING PIPES TO DELIVERING FAMILY PLANNING INFORMATION.

5. TRAINING COURSES:

A. TIMING: THE PROPOSED ITAR AND ELECTRICIAN, PLUMBING, AND PUMP TRAINING COURSES ARE SCHEDULED TO BEGIN SHORTLY

AFTER COMPLETION OF THE SURVEY OF EXISTING WATER SYSTEMS (WF.K 16). THIS HAS CREATED SOME CONCERN THAT THERE WILL BE INADEQUATE TIME TO UTILIZE THE SURVEY RESULTS IN DESIGNING THE COURSES AND IN PREPARING CURRICULA. WE, THEREFORE, SUGGEST THAT THE MISSION LOOK CLOSELY AT THE TIMING OF PROJECT ACTIVITIES DURING PP PREPARATION.

B. TA FOR CURRICULA AND COURSE DEVELOPMENT: THE MISSION MAY WANT TO CONSIDER EXTERNAL TA FOR COURSE DESIGN. IF INCLUDED, THE PP SHOULD SHOW WHICH IS PROJECT AND WHICH IS CENTRALLY FUNDED.

C. OPERATION AND MAINTENANCE TRAINING: THERE WAS SOME CONCERN THAT TWO OR THREE WEEKS OF TRAINING WOULD BE INADEQUATE TO ACHIEVE DESIRED OBJECTIVES, PARTICULARLY IN LIGHT OF EXPERIENCE WITH RHA TRAINING AND THE PAST NEED TO EXTEND SIGNIFICANTLY THE TRAINING COURSES PROVIDED THEM. IN PREPARING THE PP, THE MISSION SHOULD EXAMINE O AND M TRAINING REQUIREMENTS CAREFULLY AND IN THE PP PROVIDE AS MUCH INFORMATION AS POSSIBLE ON (A) THE SCOPE OF THE TRAINING COURSES, (B) THE LIKELY DURATION OF THE COURSES, AND (C) WHETHER VOLUNTEERS WILL NEED TO BE COMPENSATED

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DURING TRAINING. IF THE ROLE OF WOMEN IN MANAGEMENT OF COMMUNITY WATER SYSTEMS IS SUBSTANTIAL, YOU MAY WISH TO CONSIDER O AND M TRAINING FOR THEM.

D. TRAINING INSTITUTION: THE PID STATES THAT TWO INSTITUTIONS ARE BEING CONSIDERED. WE EXPECT THE INSTITUTION TO BE SELECTED DURING PROJECT DEVELOPMENT, AND THAT THIS WILL BE REFLECTED IN THE PP.

5. FINANCIAL ANALYSIS: IN LIGHT OF RECENT MOH DIFFICULTIES IN PICKING UP SALARY COSTS, THE PP SHOULD INCLUDE A FAIRLY DETAILED ANALYSIS OF RECURRING COSTS. ALSO, TO THE EXTENT POSSIBLE, IT WOULD BE USEFUL TO HAVE A MORE COMPREHENSIVE DISCUSSION OF THE WATER FINANCING PROBLEMS BRIEFLY NOTED IN THE PID. FOR YOUR INFORMATION, WE ARE POUCHING A COPY OF THE 1975 NICARAGUA RURAL HEALTH SERVICES PP WHICH PROPOSES SOME INNOVATIVE FINANCIAL MECHANISMS.

7. RELATIONSHIP TO OTHER DONOR PROGRAMS: THE PID DOES A GOOD JOB OF OUTLINING RELATED OTHER DONOR ACTIVITIES. IN ORDER TO MAKE IT A MORE USEFUL INFORMATIONAL DOCUMENT ON RURAL WATER SUPPLY IN EL SALVADOR, WE SUGGEST THAT THE PP INCLUDE A MORE DETAILED DESCRIPTION OF THE VARIOUS PROGRAMS AND THE RELATIONSHIP AMONG THEM, INCLUDING THE DEGREE TO WHICH THERE IS GEOGRAPHIC TARGETTING, IF ANY.

8. SURVEY OF APPLICATIONS: THE SURVEY IS EXPECTED TO BE COMPLETED IN 45 DAYS BY EIGHT NON-TECHNICAL PEOPLE AND ONE SUPERVISING ENGINEER. IF THE OBJECTIVE IS TO COME UP WITH ACCURATE COST ESTIMATES, WE DOUBT THAT THE PLANNED SURVEY OF APPLICATIONS WILL BE SUFFICIENT. THEREFORE, WE SUGGEST THAT THE MISSION CAREFULLY ASSESS WHAT IT HOPES TO GET OUT OF THE SURVEY, AND PLAN THE REQUIRED INPUTS ACCORDINGLY. YOU MAY WANT TO CONSIDER WAYS IN WHICH THE APPLICATIONS CAN BE CATEGORIZED, AND PRELIMINARY COST ESTIMATES ARRIVED AT THROUGH SAMPLING.

9. REHABILITATION OF SYSTEMS: THE LOG FRAME INDICATES THAT 20 RURAL WATER SYSTEMS WILL BE COMPLETELY RESTORED BY THE END OF THE PROJECT. THE PID DOES NOT, HOWEVER, APPEAR TO INCLUDE EITHER COUNTERPART OR A.I.D. FUNDING FOR THESE RESTORATIONS. DURING PROJECT DEVELOPMENT, YOU SHOULD EXAMINE THE LIKELY FINANCIAL REQUIREMENTS, IF ANY, AND SOURCES OF FUNDING.

10. APPROVAL AND AUTHORIZATION PROCEDURES: PER STATE 76107 DATED 3/27/79, PLEASE ENSURE THAT ALL NOTIFICATION REQUIREMENTS ARE COMPLETED BEFORE AUTHORIZATION. PLEASE CABLE ACTIVITY DATA SHEET INFORMATION AND REASONS FOR "ADVICE OF PROGRAM CHANGE" AS SOON AS PROJECT ACTIVITIES AND COSTS ARE DEFINED. UPON RECEIPT WE WILL PROCESS THE NOTIFICATIONS. DOLS 300,000 IS CURRENTLY AVAILABLE ON THE OYB FOR THE PROJECT. WE ARE REVIEWING WHETHER AN ADDITIONAL DOLS 90,000 CAN BE MADE AVAILABLE. WE WILL ADVISE.

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11. PID SUGGESTS THAT PP CAN BE COMPLETED BY MID-SEPT. HOWEVER, IN ORDER TO COMPLETE NECESSARY NOTIFICATIONS AND TO ENSURE OBLIGATION IN SEPTEMBER, MISSION WILL NEED TO APPROVE PP AND FORWARD ADVICE OF CHANGE INFORMATION TO LAC/DR BY SEPT. 10 AT THE LATEST. PLEASE ADVISE ASAP WHETHER THIS IS FEASIBLE. IF NOT, WE WILL NEED TO REPROGRAM THE AVAILABLE FUNDS IN THE OYB FOR OTHER ACTIVITIES.

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I. COMPONENT I & II - OPERATION AND MAINTENANCE SURVEY, PLAN AND TRAINING

One firm will be contracted to provide the following:

- A. the design of Operations and Maintenance Survey including:
 - 1. technical instrument in coordination with the DAR;
 - 2. socio-cultural instrument in coordination with the DAR and the ECS;
- B. instruction for MOH/ECS personnel in administering both instruments (30 water promoters for 5 weeks);
- C. supervising of actual survey work;
- D. tabulation and mapping of data;
- E. interpretation of data;
- F. financial analysis assessing MOH revolving fund including analysis of:
 - 1. sources and uses of revenues actually collected;
 - 2. present rates and systems of collection;
 - 3. potential revenue and possible reasons for losses;
 - 4. funding from central government directly or indirectly supporting the system.

(This basic analysis should be combined with data from the final operation and maintenance surveys. The result should be a financial analysis that lays out alternative policies to guarantee a financially viable system that can support whatever type of maintenance system is decided upon.)

Alternative decisions to be considered relevant to a financial system might include:

- 1. increased local level disbursement to finance the local maintenance program;
- 2. adjustments in water fees;
- 3. water metering;
- 4. a special fund to purchase parts and materials to guarantee their availability; and/or

74

5. subsidies from the central government budget.

G. recommendations for improving O&M by designing a preventive/corrective O&M plan to meet DAR needs and preparing a complete set of manuals fully documenting every point in the plan including all equipment, preventive and remedial procedures;

H. the specification of skills needed by MOH personnel to repair systems (prioritized according to # of systems with each problem);

I. task analysis for each level of personnel to be trained and subsequent curriculum design (to be done with ECS instructors);

J. development of curriculum materials and training courses for instructors for courses for electricians, plumbers, pump and community-based operators;

K. scheduling of instruction at regional centers, securing instructors (if CPARs are to be used train them properly) and development of evaluation;

L. instruction;

M. evaluation.

II. COMPONENT III - CPAR INSTRUCTION

One firm will be contracted to perform the following tasks:

A. coordinate ITCA, ECS, and DAR in curriculum design for CPAR courses;

B. secure TA for technical (ITCA/DAR) and socio-cultural (EDS) activities;

C. develop didactic materials;

D. schedule modules;

E. assure quantity and quality of instructors and supervision of practical field experience;

F. integrate other CPAR activities into the program i.e., O&M Survey, appropriate technology survey (regional needs should be analyzed and interim work planned to coordinate with studies);

G. evaluate the training program; and

H. certify CPAR's who complete the course.

III. COMPONENT IV - APPROPRIATE TECHNOLOGY DESIGN

One firm will be hired which meets the following criteria:

A. has prior experience in recent Apt. Tech. design (new research in last 3 to 5 years) both practical and theoretical;

B. has expertise in geohydrology which is essential due to lack of available superficial aquifers in El Salvador;

C. also has experience in lateral drilling; and

D. has experience in designing and constructing alternative sanitation technologies.

ANNEX III

THE OPERATION AND MAINTENANCE OF RURAL

POTABLE WATER SUPPLY PROJECTS OF THE MINISTRY OF HEALTH

EL SALVADOR

Bruce Clemens
Personal Services Contract
No. AID - 519 - 185

February, 1979

79

I. INTRODUCTION

This report was compiled as part of Personal Services Contract No. AID-519-185 to explore possible alternative project components to the proposed USAID/EL SALVADOR rural potable water supply activity and to provide background information for the PID and Project Paper.

Although not stipulated in the contract, the contractor determined that such a rapid evaluation of the operation and maintenance of an existing Ministry of Health water project was essential. One of the major shortcomings of many rural potable water supply projects is inadequate operation and maintenance. In all parts of the third world, rural potable water agencies have been criticized for their emphasis on constructing new water projects rather than efficiently operating and maintaining existing systems.

Of the thirty-three randomly selected projects which were visited only one (1) had been working at full capacity during the past year. Low MOH priority on operation and maintenance activities, a concomitant lack of vehicles and full-time personnel, as well as the lack of community participation in phases of project planning and design, were identified as the main reasons the other 32 systems were not fully operational.

This report presents a brief overview of the existing situation which should be more thoroughly investigated and analyzed under a USAID direct assistance grant to the GOES/MOH, which is presently scheduled for FY 79.

II. SAMPLE

Upon request, the DAR produced a list of all MOH water projects in operation in El Salvador, which included one hundred and fifty one (151) gravity systems; forty-five (45) electric pump systems; and thirty (30) hand-pump projects. The gravity and electric pumping projects were divided according to level of service, as determined by the ration of private taps to public outlets. The following matrix demonstrates the make-up of the universe: upper numbers represent the number of projects; number in parenthesis represent the sample chosen.

"MATRIX OF UNIVERSE AND SAMPLE SELECTION"

LEVEL OF SERVICE (% of private taps)	TYPE OF PROJECT			TOTAL
	GRAVITY	ELECTRIC PUMP	HAND PUMP	
100% (a)	69 (6)	43 (6)	- (-)	112 (12)
20-99% (b)	40 (6)	2 (2)	- (-)	42 (8)
0-19% (c)	42 (6)	- (-)	30 (7)	72 (13)
TOTALS	151 (18)	45 (8)	30 (7)	226 (33)

81

Due to the budgetary and time constraints a maximum of thirty-three projects were visited. The sample was chosen to represent all the types of projects in order to determine if there was any relationship between type of project and the state of operation and maintenance. After numbering each project consecutively, a random number was generated and the project corresponding to the random number was chosen to be included in the sample. This process was repeated until the required number (as shown in parenthesis in each cell of the preceding matrix) was chosen. The results of the sample selection are in the following chart.

MUESTRA AL AZAR DE PROYECTOS DE D.A.R. PARA LA EVALUACION DE MANTENIMIENTO Y OPERACION

COMUNIDAD (ES)	MUNICIPIO	DEPARTAMENTO
1. GRAVEDAD		
1.1 100% Conecciones Domiciliarias		
# 1 Cantón Candelaria	Yucuaiquin	La Unión
# 2 Monte Redondo	Concepción Quezaltepeque	Chalatenango
# 3 La China	Concepción Quezaltepeque	Chalatenango
# 4 Cantón Valle Grande	San Simón	Morazán
# 5 Cantón El Paraíso	Turin	Ahuachapán
# 6 Cantón Almendro Arriba	Sonsonate	Sonsonate
1.2 20-99% Conecciones Domiciliarias		
# 7 Cantón Sabana	Nahuizalco	Sonsonate
# 8 Cantón Cerro de Coyol	Osicala	Morazán
# 9 Cantón Teosinte, Caserío El Terreno	San Francisco Morazán	Chalatenango
#10 Cantón San José Abajo	Santiago Nonualco	La Paz
#11 Caserío Candelaria	Comocarán	San Miguel
#12 Cantón El Chunte	Sensuntepeque	Cabañas
1.3 0-19% Conecciones Domiciliarias		
#13 Cantón Chorro Abajo	Izalco	Sonsonate
#14 Cantón San Francisco El Dorado	San Isidro	Cabañas
#15 Cantón Chorrera del Guayabo Cantón San Nicolás	Sensuntepeque	Cabañas
#16 Cantón San Ramón	San Pedro Nonualco	La Paz
#17 Cantón El Jicaral	Camocarán	San Miguel
#18 Cantón San Pedro	Villa Victoria	Cabañas

67



COMUNIDAD (ES)	MUNICIPIO	DEPARTAMENTO
2. <u>BOMBEO ELECTRICO</u>		
2.1 100% Conexiones Domiciliarias		
#19 Cantón Valle Alegre	Moncagua	San Miguel
#20 Cantón Ichanguazo	Suchicoto	Cusco
#21 Cantón El Transito	Santa Maria Ostuma	La Paz
#22 Cantón El Ranchador	Santa Ana	Santa Ana
#23 Cantón El Paraiso	San Sebastian	San Vicente
#24 Cantón Llanos de la Majada	Santa Rosa Guachipilín	Santa Ana
2.2 20-99% Conexiones Domiciliarias		
#25 Cantón Los Arenales	Nahuizalco	Sonsonate
#26 Caserío El Cafetalito Cantón Santa Rosa	Cuidad Arce	La Libertad
3. <u>BOMBAS DE MANO</u>		
#27 Cantón Las Lomitas	San Miguel	San Miguel
#28 Cantón San José Labrador	San Sebastian	San Vicente
#29 Cantón La Majada	Nahuizalco	Sonsonate
#30 Cantón El Espinal	San Sebastian	San Vicente
#31 Cantón La Puerta	Armenia	Sonsonate
#32 Cantón San Francisco del Monte	Ilobasco	Cabañas
#33 Cantón Pavamá	San Alejo	La Unión

III. SURVEY

The original intention of this study was to devise a statistically sound scalar definition of the state of operations and maintenance for each project. This definition would be necessary in order to run a hypothesis test, determine α and β errors, calculate the confidence level interval and determine correlations. It became obvious however, that it was not worth the time and effort required to develop such an objective variable, which would have to reflect many synergistically related factors including pressure, quantity, quality and their variations over time. Thus to evaluate the state of operation and maintenance simple questions concerning the maintenance process, and frequency and duration of breakdowns were asked of three to five beneficiaries of each project. The beneficiaries included the treasurer or president of the water committee, the village resident in charge of operation and maintenance and other community members. The water taps that these individuals utilized were visited and the water pressure was measured where possible.

The contractor or Señor Amando Mendez Rodriguez (rural water technician from Agua del Pueblo in Guatemala) and a representative of the DAR/MOH, visited each of the selected villages during the period November 29, 1978 to February 8, 1979. A copy of the form used to compile the data is attached as Appendix A.

IV. RESULTS

The four major objectively variable indicators compiled in the study were:

- A. number of days with incomplete service during the past year;
- B. number of days with incomplete service during the past month;
- C. whether or not water was flowing from the beneficiary tap on the day of the visit; and
- D. whether or not the beneficiary was content.

The results of the compilation of these variables are listed on the following table. Of the gravity feed systems visited, the average number of breakdown-days during the previous year was 112, and during the preceeding month 10. Fifty-nine percent of the taps visited were operating effectively on the day of the visit and 60% of the beneficiaries interviewed were content with the service. Of the electric pumping projects visited, the average number of breakdown days during the previous year was 101 and during the preceeding month 14. On the day of the visit, 27% of the taps observed were operating effectively and 63% of the beneficiaries interviewed were content with the service. Each one of the seven hand pump projects visited as in complete disrepair and none of the beneficiaries were content with the service.

RESULTS OF VILLAGE SURVEY OF OPERATION AND MAINTENANCE

No. of System	Average breakdown-days in preceding year	Average breakdown-days in preceding month	ON THE DAY OF THE FIELD VISIT:			
			Was water flowing?		Was the beneficiary content?	
			YES	NO	YES	NO
1.	60	0	3	0	3	0
2	72	6.6	2	2	2	2
3	72	6.6	2	2	2	2
4	0	0	4	0	4	0
5	24	1	3	1	3	1
6	105	10	3	0	3	0
Σ (1-6)	333	24	17	5	17	5
\bar{x} (1-6)	56	4	77%		77%	
\sqrt{x} (1-6)	38	4				
7	90	30	1	0	1	0
8	110	1	2	2	2	2
9	75	5.6	3	1	3	1
10	101	16	1	3	1	3
11	91	7.5	4	0	4	0
12	137	6	2	2	2	2
Σ (7-12)	604	66	13	8	13	8
\bar{x} (7-12)	101	11	62%		62%	
\sqrt{x} (7-12)	21	11				
13	158	30	0	4	3	1
14	200	5	2	2	1	3
15	309	30	0	4	0	4
16	21	0.8	4	0	2	1
17	365	30	0	4	0	4
18	4	0	3	0	3	0
Σ (13-18)	1,077	96	9	14	9	13
\bar{x} (13-18)	180	16	39%		41%	
\sqrt{x} (13-18)	151	15				
SUB TOTALS FOR GRAVITY SYSTEMS:						
Σ (1-18)	2,014	186	39	27	39	26
\bar{x} (1-18)	112	10	59%		60%	
\sqrt{x} (1-18)	100	12				
19	288	22	0	4	1	3
20	8.8	2	2	2	4	0
21	224	20	0	4	0	4
22	19	5	3	0	3	0
23	24	17	1	2	3	0
24	182	27	0	4	0	4
Σ (19-24)	746	93	6	16	11	11
\bar{x} (19-24)	124	16	27%		50%	
\sqrt{x} (19-24)	122	10				

7

No. of System	Average breakdown-days in preceding year	Average breakdown-days in preceding month		ON THE DAY OF THE FIELD VISIT:			
				Was water flowing?		Was the beneficiary content?	
				YES	NO	YES	NO
25	21	10		0	4	4	0
26	39	6		2	2	4	0
$\sum x(25-26)$	60	16		2	6	8	0
$\bar{x}(25-26)$	30	18	%:	25		100	
$\sqrt{x}(25-26)$	13	3					
SUB TOTALS FOR ELECTRIC PUMP SYSTEMS:							
$\sum x(19-26)$	806	109		8	22	19	11
$\bar{x}(19-26)$	101	14	%:	27		63	
$\sqrt{x}(19-26)$	112	9					
TOTAL FOR GRAVITY AND ELECTRIC PUMP SYSTEMS:							
$\sum x(1-26)$	2,820	295		47	49	58	37
$\bar{x}(1-26)$	108	11	%:	49%		61%	
$\sqrt{x}(1-26)$	102	11					

Although it is difficult to draw any statistically rigorous findings from this data due to the small sample size and externalities, such as age of project, and different socio-cultural conditions of each project community, one obvious conclusion is that the systems are not being maintained effectively.

The major causes of the failures were as follows (the numbers in parentheses refer to the number of projects experiencing each cause):

- A. lack of community interest either in paying the maintenance fee, or controlling the overuse of water (24);
- B. excess demand and/or poor hydraulic design (18);
- C. excess leakage (10);
- D. poor control of pumping hours (6);
- E. mechanical or electric failure of pumps or motor (5);
- F. failures due to operator (5);
- G. failure of external energy source (electricity) (4);
- H. vandalism (3); and
- I. failure of water source (3).

V. RECOMMENDATIONS

The causes of the water system failures, which were not of a sophisticated or complex technical nature, can be categorized as either:

- A. low MOH priority for operation and maintenance activities demonstrated by a lack of supplies, vehicles, training and directly-assigned personnel, or
- B. lack of community participation in project planning, design and operation.

This contractor recommends that before USAID funds are allocated to the MOH for the implementation of new potable water projects, the following activities should be carried out:

A. Perform Cost of Service Study of the Revolving Fund

The MOH utilizes a revolving fund to finance the operation and maintenance of their water systems. Each beneficiary pays a monthly tariff to support this revolving fund, which ranges from US \$0.20 to US \$2.00 depending on the type of system (gravity or pumped) and level of service

(public or private taps). Preliminary discussions with MOH personnel indicate that the fund has not been adequate to defray expenses, however, there is a US \$200,000 balance in the account. An audit should be run of the revolving fund to determine if the existing rates are sufficient to cover operational expenses including depreciation charges of hardware such as pumps and motors.

B. Develop a more appropriate methodology for individual project implementation to assure maximum community participation on all levels

Each rural environmental sanitation project should be an integrated undertaking composed of a large number of activities:

- measurement of water source yield
- census
- bacteriological and physical/chemical analysis of water source
- preliminary cost estimate
- organization of village water committee
- community consciousness level raising
- formal contractual agreements
- legal rights for water source
- latrine installation
- reforestation
- topography
- engineering design
- construction
- health education

With so many activities, an executing agency with its financial and time constraints often concentrates on technical aspects at the expense of "soft" socio-cultural community based activities. As demonstrated in AID/W directives on water supply, however, these aspects are the most important to assure eventual program success in the operation and maintenance of rural water systems.

One manner in which to overcome this problem is to institute a methodology delineating the successive steps to be implemented as a rural environmental sanitation project progresses. Such a methodology was instituted in the USAID/Guatemala-CARE "Rural Water and Latrine Construction" O.P.G. Project No. 520-0231. A project evaluation summary (PES No. 79-4) was sent to AID/W on December 12, 1978.

C. Create an official operation and maintenance department within the DAR including assignment of adequate personnel

At present operation and maintenance (O&M) activities are performed by personnel with many other responsibilities. It would not be efficient

to delegate the O&M responsibility outside of the DAR, but adequate personnel should be directly assigned for operation and maintenance.

- D. Train the 80 currently employed and 180 volunteer community-based water system operators

9/12

ANNEX III: Clemens

APPENDIX A

**DATA COLLECTION QUESTIONNAIRE
FOR COMMUNITY SURVEY**

Enero-Febrero 1979

ENCUESTA PARA LA EVALUACION DE LA OPERACION Y MANTENIMIENTO DE SISTEMAS DE AGUA POTABLE
RURAL EL SALVADOR

A. DATOS BASICOS

Investigador _____ Fecha: _____

Acompañantes:

Puestos:

- | | |
|----------|----------|
| 1) _____ | 1) _____ |
| 2) _____ | 2) _____ |
| 3) _____ | 3) _____ |

Comunidad (es) Servida(s): _____

Municipio _____ Departamento _____

B. TIPO DE SISTEMA

Nombre de Comunidad:

1. Número de chorros públicos
2. Usuarios de chorros públicos
3. Numero de conecciones domiciliarias

1)	2)	3)

Observaciones: _____

C. DEMOGRAFIA

Censo de _____ Año _____

Comunidad			
No. de casas en casco			
No. de casas en total			
Población Total			
No. de usuarios			

D. HISTORIA DEL SISTEMA

Primer Contacto _____
Encuesta Básica _____
Construcción empezo _____
Inaguración _____

OBSERVACIONES: _____

E. OPERACION Y MANTENIMIENTO

1. Encargado: _____ Ocupación _____

A. En el año pasado cuantos días no tenía suficiente agua la comunidad:

RAZONES	NUMERO DE DIAS
	16

B. En el mes pasado cuantos días no tuvieron suficiente agua en la comunidad:

RAZONES	NUMERO DE DIAS

C. Hoy hay agua suficiente en toda la comunidad? _____

D. Cuando fué la última limpieza de los tanques? _____

E. Cuando fué la última vez que sangraron (aire) las cañerías? _____

F. Cuando fué la última vez que drenaron las cañerías? _____

G. Han recibido adiestramiento? _____

H. Le ayudaría mas adiestramiento? _____ Que aspectos _____

2. TARIFAS

Fecha de reporte más reciente: _____

Comunidad

Suscritos morosos este mes

Suscritos morosos en total

Cantidad en total en mora

OBSERVACIONES: _____

ANNEX III: Ciemena

F. Cuales proyectos comunales se hisieron antes de agua potable y en que año aproximada?

La realizacion de proyecto de agua potable ayado a estimular la comunidad para hacer otros proyectos comunales? _____ Como? _____

Cuales proyectos comunales se hisieron despues de agua potable y en que año aproximada?

G. Como se pudiera mejorar el sistema de operacion y mantinamiento? _____

H. Observaciones generales: _____

29/100

Project No. 519-0209

Rural Water Supply and Sanitation

ILLUSTRATIVE BUDGET *

	1980		1981		1982		TOTAL	
	GOES	AID	GOES	AID	GOES	AID	GOES	AID
I. Salaries	\$ 15,600		\$ 48,285		\$ 20,625		\$ 84,510	
II. Technical Assistance		\$ 26,250		\$140,300		\$ 71,500		\$238,050
III. Administration	40,627		59,707		46,477		146,811	
VI. Training		15,200	520	42,900	4,550	37,120	5,070	95,220
V. Commodities	60,000	3,000	30,000	66,000	50,000	13,000	140,000	82,000
VI. Other Costs				7,100				7,100
VII. Contingency		2,000		2,000		2,000		6,000
VIII. Inflation			13,851	25,630	25,547	25,541	39,398	51,171
TOTAL	\$116,227	\$ 46,450	\$152,363	\$283,930	\$147,199	\$149,161	\$415,789	\$479,541

* Line items may be adjusted up to 15% with written approval of USAID/Health, Population, Nutrition Division

ANNEX IV: Detailed Budget

COMPONENT I: O&M Survey

RURAL WATER SUPPLY & SANITATION
Project No. 519-0209

	1980		1981		1982		TOTAL	
	GOES	AID	GOES	AID	GOES	AID	GOES	AID
I. Salaries								
A) 30 rural water promoters \$13/day for 10 days	\$ 3,900						\$ 3,900	
B) 8 rural water promoters \$13/day for 80 days			\$ 8,320				8,320	
II. Technical Assistance (International)								
A) Salaries/Fringe		\$ 18,000		\$ 38,400				\$ 56,400
B) Per Diem-\$50/day 1980-105 days 1981-224 days		5,250		11,200				5,250 11,200
C) Travel '80-3 round trips '81-6 round trips		1,500		3,000				1,500 3,000
D) Miscellaneous		1,500		3,000				4,500
III. Mgmt/Administration Jeep mileage-63,500 miles at \$.18/mile			11,430				11,430	
IV. Local Training Per-diem - 30 rural water promoters \$10/day for 10 days		3,000						3,000

ANNEX IV: Detailed Budget

92

103

	1980		1981		1982		TOTAL	
	GOES	AID	GOES	AID	GOES	AID	GOES	AID
V. Commodities Training supplies and materials		\$ 1,000						\$ 1,000
VI. Other - Survey Per-diem- 8 rural water promo- ters for 80 days \$6/day				\$ 3,840				3,840
VII. Contingency		1,000		500				1,500
VIII. Inflation			\$ 1,975	5,944			\$ 1,975	5,944
TOTAL	\$ 3,900	\$ 31,250	\$ 21,725	\$ 65,884			\$ 25,625	\$ 97,134

- 3 -

ANNEX IV: Detailed Budget

93

COMPONENT II

RURAL WATER SUPPLY & SANITATION
Project No. 519-0209

	1980		1981		1982		TOTAL	
	GOES	AID	GOES	AID	GOES	AID	GOES	AID
I. Salaries								
A) 16 elect. technicians for 30 days at \$13/day			\$ 6,240				\$ 6,240	
B) 20 plumbers for 30 days at \$8/day			4,800				4,800	
C) 120 pump operators for 50 days at \$6/day			7,200				7,200	
D) 500 community operators for 5 days at \$3/day			1,500		\$ 6,000		7,500	
II: TA (International)								
A) Salaries/Fringe						\$ 38,400		\$ 38,400
B) Per-diem-224 days at \$50/day						11,200		11,200
C) Travel-6 round trips						3,000		3,000
D) Misc.-supplies and expenses						3,000		3,000
III. Mgnt/Administration								

- 4 -

ANNEX IV: Detailed Budget

9/1

101

105

	1980		1981		1982		TOTAL	
	GOES	AID	GOES	AID	GOES	AID	GOES	AID
IV. Local Training-\$10/day								
A) Per-diem-16 elec. for 30 days and 20 plumbers for 30 days				\$ 10,800				\$ 10,800
2 regional 6/days 120 P.O.- 10/days 500 S.O.- 5/days				4,440		\$ 17,760		22,200
B) Instructors								
Elect. Tech. course \$80/day for 30 days				2,400				2,400
Plumber course \$80/day for 30 days				2,400				2,400
Pump Oper. course \$13/day for 40 days			520				520	
Local Oper. course \$13/day for 350 days					\$ 4,550		4,550	
C) Misc. supplies and expenses and per-diem at \$6/day				3,500				3,500
V. Commodities								
Tool kits-500 at \$100				50,000				50,000
Training Supplies and materials				10,000		10,000		20,000
System repair supplies			30,000		50,000		80,000	

- 5 -

ANNEX IV: Detailed Budget

95-

	1980		1981		1982		TOTAL	
	GOES	AID	GOES	AID	GOES	AID	GOES	AID
VI. Other								
VII. Contingency				\$ 500		\$ 1,000		\$ 1,500
VIII. Inflation			\$ 5,026	8,354	\$ 12,716	17,506	\$ 17,742	25,860
TOTAL			\$ 55,286	\$ 92,394	\$ 73,266	\$101,866	\$128,552	\$ 194,260

- 6 -

COMPONENT III.

RURAL WATER SUPPLY & SANITATION
Project No. 519-0209

101

	1980		1981		1982		TOTAL	
	GOES	AID	GOES	AID	GOES	AID	GOES	AID
I. Salaries								
A) 30 rural water promoters (C.D. training) at \$13/day for 30 days	\$ 11,700						\$ 11,700	
B) 15 CPAR trainees \$13/day for 150 days (75/yr.)			\$ 14,625		\$ 14,625		29,250	
II. TA (International)								
A) Salaries/Fringe				\$ 9,600		\$ 9,600		\$ 19,200
B) Per Diem-\$50/day for 56 days				2,800		2,800		5,600
C) Travel '81-6 round trips '82-6 round trips				3,000		3,000		3,000 3,000
D) Misc. supplies and expenses				500		500		1,000
III. Mgnt/Admin. Jeep mileage for 65,000 miles at \$.18/mile			5,850		5,850		11,700	
IV. Local Trng-\$10/day								
A) Per-diem 15 rural water promoters 150 days 30 rup for 30 days		\$ 9,000		11,250		11,250		31,500

ANNEX IV: Detailed Budget

97

	1980		1981		1982		TOTAL	
	GOES	AID	GOES	AID	GOES	AID	GOES	AID
III. Local Trng-\$10/day								
B) Instructors								
180 days								
'80 - 30		\$ 2,400						\$ 2,400
'81 - 75				\$ 6,000				6,000
'82 - 75						\$ 6,000		6,000
C) Per Diems, Travel								
Misc. expenses								
(\$10/day)		800		2,110		2,110		5,020
V. Commodities								
Training supplies		2,000		4,000		3,000		9,000
and materials								
VI. Other costs -								
International travel				1,000				1,000
VII. Contingency		1,000		500		1,000		2,500
VIII. Inflation			\$ 2,048	4,026	\$ 4,300	8,035	\$ 6,348	12,061
TOTAL	\$ 11,700	\$ 15,200	\$ 22,523	\$ 44,786	\$ 24,775	\$ 47,295	\$ 58,998	\$ 107,281

COMPONENT IV

RURAL WATER SUPPLY & SANITATION
Project No. 519-0209

101

	1980		1981		1982		TOTAL	
	GOES	AID	GOES	AID	GOES	AID	GOES	AID
I. Salaries								
A) DAR Engineer at \$40/day for 75 days			\$ 3,000				\$ 3,000	
B) 4 rural water promoters at \$13/day for 50 days			2,600				2,600	
II. TA (International)								
A) Salary/Fringe				\$ 49,200				\$ 49,200
B) Per diem-\$50/day 252 days				12,600				12,600
C) Travel- 8 round trips				4,000				4,000
D) Misc. supplies and expenses				3,000				3,000
III. Mgmt/Admin. jeep mileage for 10,000 miles at \$.18/mile			1,800				1,800	
IV. Local Training								
V. Commodities Supplies & materials				2,000				2,000

79

	1980		1981		1982		TOTAL	
	GOES	AID	GOES	AID	GOES	AID	GOES	AID
VI. Other Costs								
A) Survey Per diems 4 x \$6/day for 50 days				\$ 1,200				\$ 1,200
B) International Travel				1,060				1,060
VII. Contingency				500				500
VIII. Inflation			\$ 740	7,306			\$ 740	7,306
TOTAL			\$ 8,140	\$80,866			\$ 8,140	\$ 80,866

100

110

I. ORGANIZATION OF ENVIRONMENTAL SANITATION: NATIONAL LEVEL

The principal organizations within the Government of El Salvador involved in rural environmental sanitation are:

- A. National Administration of Water Supply and Drainage (ANDA)
- B. Bureau of Health Engineering (DIS)
- C. Department of Rural Water Supply (DAR)
- D. Division of Environmental Sanitation (DSA)
- E. Division of Health Education (DES)

Their relative hierarchical positions are shown on the following organizational chart. The brief resume of their responsibilities provided below reflects their overlapping and independent responsibilities and the need to coordinate with each other if this project is to have its anticipated impact.

A. ANDA

ANDA was created in 1960 to serve as a semi-autonomous agency responsible for all rural and urban water supply. ANDA's charter stipulated that the agency had to generate internally all necessary capital and depreciation expenses from user charges. After constructing 33 rural systems it became obvious that the user charges from rural systems were not sufficient to amortize all of the capital costs involved in the construction. Thus, in 1972 ANDA officially delegated its authority over rural water systems to the DAR and transferred all appropriate personnel to it.

B. Bureau of Health Engineering (DIS)

The Bureau of Health Engineering (DIS) is responsible for the coordination of hospital construction, health engineering and architecture, maintenance of MOH facilities and hardware, in addition to rural water and sanitary waste disposal. DIS has been the ultimate executing agency for IDB rural water supply loans 324 and 504. Due to its hierarchical position within the Ministry of Health, the experience of major IDB loan administration and the current situation of the ANDA, the DIS has been chosen as the direct executing agency.

C. Department of Rural Water Supply (DAR) (Departamento de Acueductos Rurales)

Within the DIS the Department of Rural Water Supply has primary responsibility for the implementation of rural water supply projects. Due

112

to its staff, budget, and experience the DAR will be the institution responsible for the major share of project implementation. Section II of this Annex "DAR Staffing and Organizational Structure" includes more detailed information regarding this department.

D. Division of Environmental Sanitation (DSA)

The Division of Environmental Sanitation (DSA) under the Bureau of Technical and Normative Standards is responsible for setting norms and policies regarding rural potable water supply for the DAR. By accepting all design and methodological standards proposed by that institution, however, the DSA has in essence become a rubber stamp for the DAR in terms of potable water. Similarly, although the DSA was the initial executing agency for the first IDB rural potable water loan (324), the responsibility was eventually transferred to the Bureau of Health Engineering (DIS).

E. Division of Health Education (DES)

The Division of Health Education also belongs to the Bureau of Technical and Normative Standards and is responsible for health education activities carried out in MOH facilities throughout the country. Approximately 20 health educators located in the regional health offices design teaching materials and lessons and supervise the education program which is carried out by nurses, sanitarians and other MOH personnel in local health establishments.

102

MOH ORGANIZATIONAL CHART

OFFICE OF THE MINISTER AND VICE MINISTER
OF PUBLIC WORKS

NATIONAL ADMINISTRATION OF
ACUEDUCTS AND DRAINAGE (ANDA)

OFFICE OF THE MINISTER AND VICE MINISTER
OF HEALTH

GENERAL BUREAU OF HEALTH

BUREAU OF TECHNICAL
AND NORMATIVE SERVICES

BUREAU OF HEALTH ENGINEERING
(DIS)

DIVISION OF
HEALTH EDUCATION
(DES)

DIVISION OF
ENVIRONMENTAL
SANITATION
(DAS)

DEPARTMENT OF
RURAL ACUEDUCTS
(DAR)

- 3 - ANNEX V: Administrative Information

II. DAR/Staffing and Organizational Structure

A. Present DAR Organization and Methodology

As previously explained, the DAR under the MOH Bureau of Health Engineering (DIS) has primary responsibility for the provision of rural water supply. The DAR organization is divided into two operational levels: the national or central office and the regional offices. The national office provides centralized management and technical support for planning, execution, and operation of the rural water supply program and consequently contains the majority of the DAR's technically expert personnel. These technicians are distributed among four operating sections (1) section of operation and maintenance, (2) the construction and supervision section, (3) the hydraulic design section, and (4) the promotion section. (See DAR Organizational Chart - Central Level, p.5)

The hydraulic design section is responsible primarily for developing and finalizing all systems design, including the development of all design documents. Its staff includes two design engineers with four junior engineers. Also associated with the design section is a hydrogeologist who ultimately identifies the water source and sets parameters of well design such as depth, casing diameter, and screen locations. The construction and supervision section has the ultimate responsibility for construction of the water systems. Staffing in this section includes drilling crews with a total of six individuals and three electromechanical crews consisting of a supervisor/technician and 3 to 4 assistants. The electromechanical crews are responsible for installing and maintaining all electrical equipment and distribution lines. The operation and maintenance section has responsibility for supervising the O&M activities, most of which are carried out by regional staff. Accordingly, this section has a small staff and depends largely on the above mentioned electromechanical crews to perform many of the on-site O&M duties. Finally, the national office maintains a small section for supervising the community promotion activities associated with installation of rural water systems.

Most of the more immediate operational responsibilities in planning, execution and operation are delegated by the central DAR office to each of the four regional health offices. (see DAR Organizational Chart for Regions, p. 6). Within each regional office a regional engineer directs all regional water supply and sanitation programs. In two regions this position is filled by a sanitary engineer, while in the other two regions the position is filled by an experienced "technician".

Each regional engineer has a staff to assist with his rural water supply and sanitation duties. A potable water "engineer" is designated to head all promotion, planning, construction, operation and maintenance activities associated with potable water supply systems. This position is filled not by an engineer, but by a technician with at least ten

ANNEX V: Administrative Information
 DAR Organizational Chart - Central Level

- 5 -

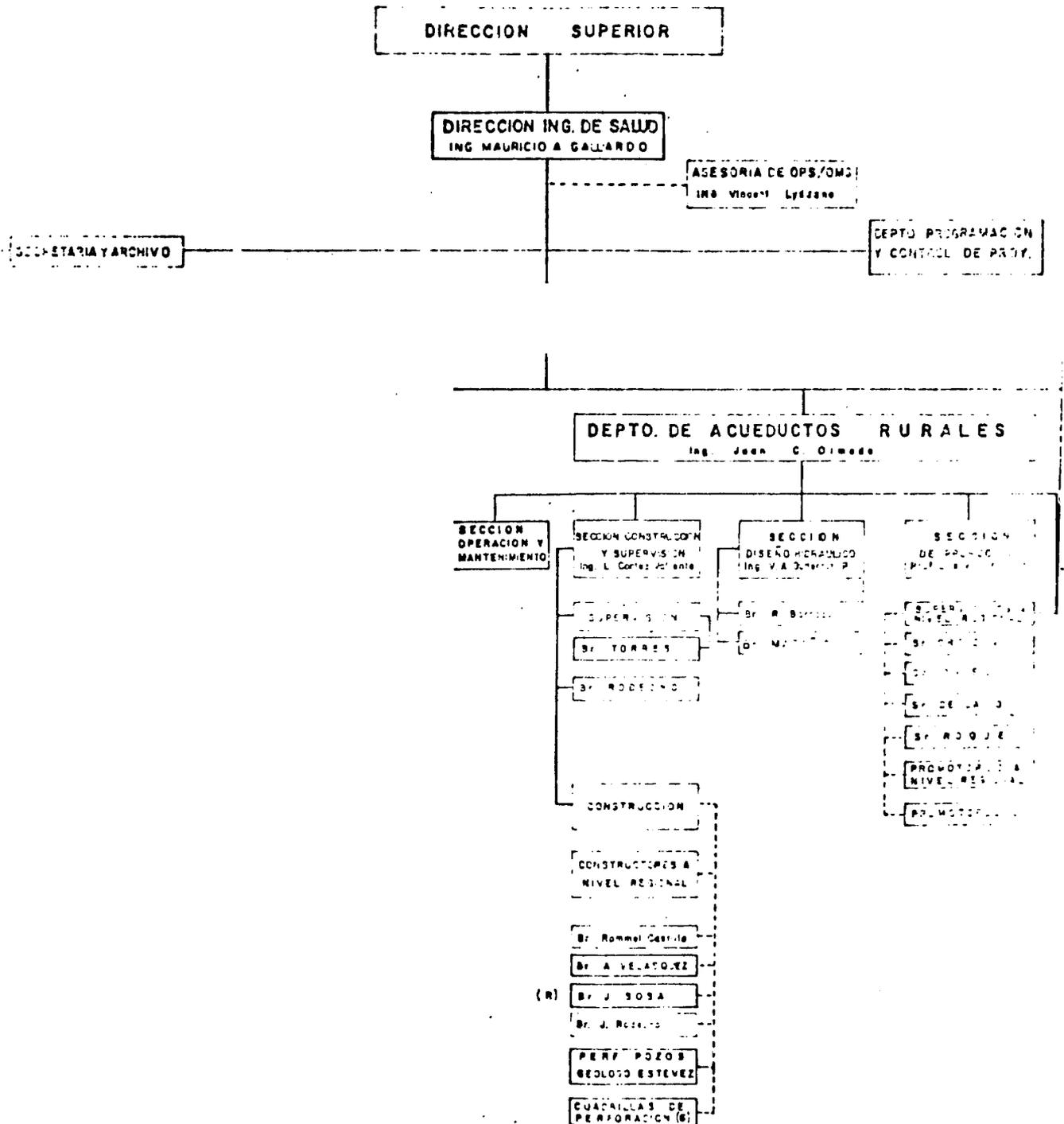
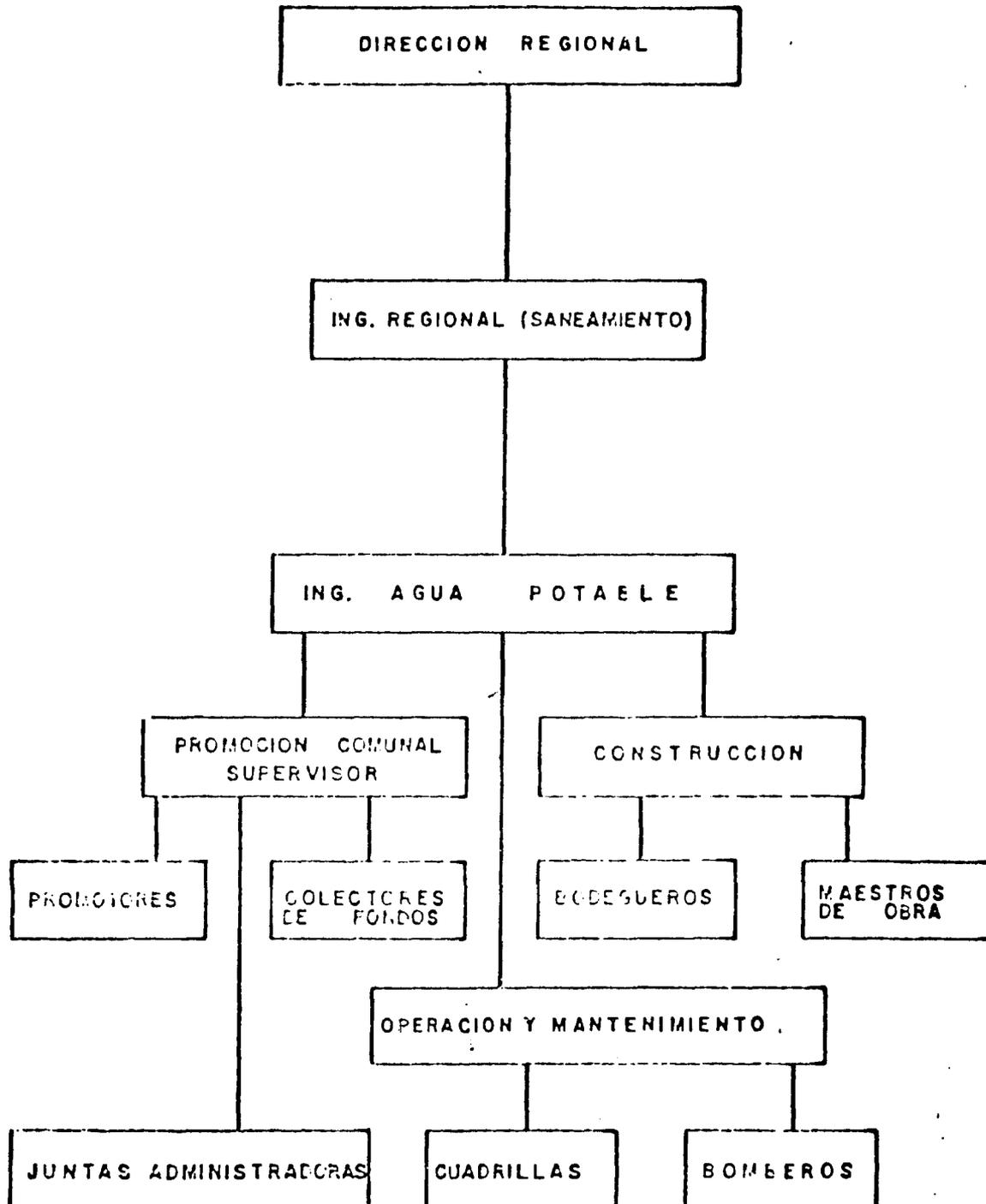


DIAGRAMA DE FUNCIONAMIENTO
 DIRECCION DE INGENIERIA DE SALUD
 MINISTERIO DE SALUD PUBLICA Y ASISTENCIA

15

103

DIRECCION DE INGENIERIA DE SALUD
ORGANIZACION REGIONAL DEL
PROGRAMA DE AGUA POTABLE RURAL



years of work experience. He supervises a staff which includes a plumbing crew of four to five plumbers (cuadrilla) who are primarily involved with maintenance activities, two to four collectors who are responsible for collection of all village water tariffs, numerous pump operators who are responsible for day-to-day operation of electric pump systems, and six to eight promoters (promotores en acueductos rurales) who are responsible for community organization and the development of initial technical documents. In addition, private building contractors (maestros de obra) are used to construct the actual system, and warehousemen (bodegueros) are hired to manage construction materials. These personnel have varying levels of experience and expertise. The promoters are the most sophisticated and usually have at least ninth grade education, some limited technical education, and 5 to 20 years experience in the position of promoter. Plumbers and pump operators on the other hand, have only very rudimentary education and expertise.

According to the currently used DAR methodology water supply projects are initiated by the rural village when it presents an application for a water system to either the regional or central DAR office. This application usually is made by a community "pro-water" committee and signed by all villagers who can write.

Once an application is received, the regional office sends a promoter to the requesting community to undertake a "preliminary technical investigation" of the water source and village. The promoter then carries out a "basic study" to obtain technical, social and economic data necessary to determine project feasibility and design. The data includes in-depth population statistics, an assessment of the ability and willingness of villagers to pay for a water system, identification of desired service levels, availability of electricity, and biological and chemical analyses of water sources. A map is prepared, which shows location of each home and major landmarks within the community, as well as water sources. This information is sent in a formal report to the central office of DAR in San Salvador which is responsible for all design work. These activities may require several visits by technical experts from the central office to assemble all necessary information such as topographical features and water availability and quality. The prepared design document is returned to the regional engineer who then schedules the actual project construction. A contracted builder constructs the system with the help of labor supplied by the community. Much of the promoter's activity at this stage centers on community organization efforts to ensure the adequate supply of labor. Once the system is completed and inaugurated, maintenance responsibilities fall largely to the regional plumbers and tariff collection to the regional collectors.

B. Proposed Changes in DAR Structure

Preliminary analysis performed during project preparation indicates that new roles or tasks will be assigned to the national electromechanical

personnel, regional plumbers, rural water promoters, and pump operators and community systems operators. Most of the national electromechanical staff will be relocated and, therefore, delegation of most of their project installation and repair duties will be made to the newly organized regional staff. Under the new program, the regional plumbers will perform those tasks now assigned to them along with additional routine maintenance chores which will be identified in the maintenance plan designed under Component I. The training courses under Component II will insure their ability to perform these tasks effectively. Pump operators and community systems operators will also continue in their basic duties of filling the reservoirs but in addition will be taught and assigned duties of system surveillance, routine maintenance, and simple repairs.

The course of instruction for the new CPARs (described in Section III) will train them to perform a broad range of duties within the regional structure. They will be placed in supervisory positions over three regional divisions responsible for (1) feasibility studies and technical and socio-cultural data collection; (2) construction; and (3) operation and maintenance.

III. Guidelines for Preparation of Training Courses Using Occupational Analysis

A preliminary curriculum was developed for this project paper based on a rudimentary analysis of the new CPAR position and on general discussions held with representatives of the DAR. It is recommended, however, that the formal curriculum be detailed utilizing an "occupational analysis" (OA) methodology. According to the basic principles of this methodology staff development should be a direct function of the specific tasks to be implemented. In the case of the CPARs it will be necessary for the DAR to elaborate the specific tasks the CPARs will perform. As these tasks are defined the curriculum is outlined and divided into distinct modules.

In addition to the instructors, director of the DAR, and the CPAR supervisors, OA methodology calls for the potential students, as well, to be integrally involved in the curriculum development process. In this manner the course preparation process becomes a learning experience which also serves as a basis for teacher training.

The major stages for development of the training courses are as follows:

A. Task Analysis

The present DAR personnel structure and support facilities should be analyzed and the capacity of the training institutions further explored. For each post to be trained or upgraded, the DAR should develop a job profile. The personnel structure which results can be finalized and presented in a graphical format, described by geographical assignment, hierarchical placement, and tasks to be performed. At this same time the broad objectives for the evaluation plan ought to be delineated.

B. Curriculum Design

Based on the preceding task analysis teaching modules and individual subjects required for each will be determined. The selection of modules will define both course structure and schedule. Specific objectives for evaluating the training program will be identified. At this time it is also expected that an appropriate bibliography will be compiled, professors will be selected and the criteria for student selection will be finalized.

C. Curriculum Development Workshop

This workshop, the most important phase of the course preparation, requires active participation of DAR design, construction and operation and maintenance engineers, and promotional staff, regional level engineering staff, ITCA course instructors, and the rural water promoters - the students themselves. The purpose of the workshop includes the development of the detailed course syllabus which utilizes previously established

training modules and which incorporates theoretical classroom training with practical field work. The development of teaching manuals and didactic materials as well as the final evaluation plan will also result. The most important output of this workshop, however, will be the experience gained by all participants regarding learning and teaching theory and curriculum development.

D. Actual Training

The three preceding stages are essential to assure that this phase - the actual training - is effective, relevant and feasible.

E. Evaluation

Formative evaluation will take place continuously during the training program to provide feedback for improving instruction. Upon completion of the training program a final, in-depth evaluation will be carried-out based on the originally defined objectives in order to improve future CPAR training courses.

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT LAC/DR-IEE-79-45
WASHINGTON, D. C. 20523

ASSISTANT
ADMINISTRATOR

ENVIRONMENTAL THRESHOLD DECISION

Location : All regions throughout El Salvador
Project Title : Rural Water Supply and Sanitation, 519-0209
Funding : FY 1979, \$383,535 Grant
Life of Project: Two years

Mission Recommendation:

Based on the Initial Environmental Examination, the Mission has concluded that the project will not have a significant effect on the human environment and therefore recommends a Negative Determination.

The Development Assistance Executive Committee of the Bureau for Latin America and the Caribbean has reviewed the Initial Environmental Examination for this project and concurs in the Mission's recommendation for a Negative Determination.

AA/LAC Decision:

Pursuant to the authority vested in the Assistant Administrator for Latin America and the Caribbean under Title 22, Part 216.4a, Environmental Procedures, and based upon the above recommendation, I hereby determine that the proposed project is not an action which will have a significant effect on the human environment, and therefore, is not an action for which an Environmental Impact Statement or an Environmental Assessment will be required.

Assistant Administrator for
Latin America and the Caribbean

July 24
Date

Clearances:

LAC/DR:Environmental Advisor:ROtto
DAEC Chairman:MBrown

VI. INITIAL ENVIRONMENTAL EXAMINATION**I. BASIC PROJECT DATA**

PROJECT LOCATION: All regions throughout El Salvador

PROJECT TITLE: Rural Water Supply and Sanitation

FUNDING: FY 1979, \$383,535 Grant

LIFE OF PROJECT: Two years

I.E.E. PREPARED BY: C.R. Gavidia, Gen. Eng. Env. Coord.
J. E. La Rosa, IDI, HP&N

THRESHOLD DECISION: Negative environmental decision recommended
(see page 22 where the recommendations for environmental action are fully stated).

II. PROJECT DESCRIPTION

This project will assist the GOES Ministry of Health (MOH) to expand and sustain access of rural poor to rural water and sanitation facilities. Current major constraints to construction and maintenance of rural water systems and sanitation facilities are addressed by each one of the four project components.

Under the first component, an operation and maintenance survey will be conducted of a substantial number of the 670 existing rural aqueducts to determine their physical condition, the quality and quantity of the water supplied, the community role in operation and maintenance activities, existing operating problems, routine maintenance needs, and financial viability of the system. Based on the results of the survey and an analysis of the MOH/Rural Aqueduct Department (DAR) revolving fund, a cost-effective maintenance program will be designed.

A training course to upgrade the skills of 15 DAR rural aqueduct promoters makes up the second project component. These promoters will receive training in technical as well as socio-cultural aspects of rural water systems design, construction, operation and maintenance. Upon completion of the nine months course, the "Impulsor Técnico de Acueductos Rurales" -- or ITARs as they will be renamed--will be responsible for organizing communities, completing initial technical studies, assisting in the development of more detailed technical studies required to design rural water and latrine facilities, supervising water systems and latrine construction and health education activities, inaugurating these systems and setting the stage for effective operation and maintenance. The increased skill level of these intermediate-level technicians is expected to augment MOH/DAR regional capacity to undertake greater responsibilities thereby encouraging a process of decentralization.

The third project component includes training of DAR personnel in various aspects of operation and maintenance of rural water systems. Individuals who will receive the short, two to three week periods of instruction include 20 plumbers, 60 pump operators, 500 community-based water system operators and four electrical technicians. Courses will be tailored to fit the needs and capabilities of each group with the regionally-based plumbers receiving the most advanced and intensive instruction. This training will provide a basis for initiating routine operational and maintenance activities at the local level and will insure that a more advanced maintenance capability is available within the regional health offices. At least 20 deficient rural water systems will be restored to full operation as part of the practicums associated with coursework. The results of the survey conducted under the first component will be used to design the curriculum to ensure that the courses are germane to the operational and maintenance needs of the regional MOH offices.

The final component of the project is a survey of 800 existing applications for installation of community water supply systems. This survey was requested by the MOH in order to obtain accurate estimates of costs associated with the installation of these 800 systems so that accurate funding requirements will be available for long-term planning of MOH/DAR activities during the upcoming UN Water Decade --1981-1990.

The activities that will be undertaken within each of these four components will lead to an increase in construction and maintenance of rural water systems with a new emphasis on integrating environmental sanitation and health education activities into the MOH methodology. As skill levels of lower-echelon DAR personnel are upgraded their ability to install and maintain rural water systems and sanitation facilities will increase as will the number of rural poor beneficiaries served by those systems.

III. IMPACT IDENTIFICATION AND EVALUATION FORM

Impact Areas and Sub-areas.

Impact Identification and Evaluation 1/

A. LAND USE

1. Changing the character of the land through:
 - a. Increasing the population..... N
 - b. Extracting natural resources..... N
 - c. Land clearing..... N
 - d. Changing soil capacity..... N

The project has no impact on land use.

B. WATER QUALITY

1. Physical state of water..... N
2. Chemical and biological states..... M to L
3. Ecological balance M to L

The project has a beneficial effect on existing water bodies through the control of human waste disposal and drainage. It should improve both the chemical and biological status of surface water body and thereby improve the ecological balance by discouraging eutrophication.

C. ATMOSPHERIC

1. Air additives..... N
2. Air pollution..... L

The project has no effect on the atmosphere with the possible exception of reducing the amount of annoying odors discharged to the atmosphere from poorly maintained sanitary facilities.

D. NATURAL RESOURCES

1. Diversion, altered use of water..... M
2. Irreversible, inefficient commitments... M

The project may have some effect on the amount of water retained regionally as ground-water storage. This effect is expected to be minimal since ground-water withdrawals from the proposed well systems will be relatively small.

1/ Use the following symbols:

- | | | | |
|---|------------------------------------|---|--------------------------------------|
| N | <u>No</u> environmental impact | M | <u>Moderate</u> environmental impact |
| L | <u>Little</u> environmental impact | H | <u>High</u> environmental impact |

185/26.

E. CULTURAL

- 1. Altering physical symbols..... N
- 2. Change of cultural traditions..... M

Community development activiites should have positive cultural effect.

F. SOCIO-ECONOMIC

- 1. Changes in economic/employment patterns..... M
- 2. Changes in population..... N
- 3. Changes in cultural patterns..... M

All effects will be beneficial. The provision of water supply and sanitation facilities will definitely raise economic status of rural poor.

G. HEALTH

- 1. Changing a natural environment..... M
- 2. Eliminating an ecosystem element..... N

Project will have a beneficial impact on health through the provision of potable water and sanitation facilities.

H. GENERAL

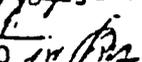
- 1. International impacts..... N
- 2. Controversial impacts..... N
- 3. Larger program impacts..... M to H

Project will have a significant beneficial impact on larger programs for the provision of potable water and sanitation facilities.

IV. ENVIRONMENTAL ACTION RECOMMENDED

It is recommended that a negative determination be given to this project. The proposed action is not an action which will have a significant effect on the human environment and is therefore an action for which an Environmental Impact Statement or an Environmental Assessment will not be required.


Adelmo Ruiz, Director

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 CRGavidia, Gen. Eng. Jul:7/2/79
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PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

ANNEX VII

Life of Project:
From FY 79 to FY 82
Total U.S. Funding \$480,000
Date Prepared: September 1979

(INSTRUCTION: THIS IS AN OPTIONAL FORM WHICH CAN BE USED AS AN AID TO ORGANIZING DATA FOR THE PAR REPORT. IT NEED NOT BE RETAINED OR SUBMITTED.)

Project Title & Number: RURAL WATER SUPPLY AND SANITATION 519-0209

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <p>To reduce the incidence of disease of rural poor of El Salvador</p>	<p>Measures of Goal Achievement:</p> <p>Morbidity and mortality rates particularly infant mortality and child (under 5 years) mortality reduced</p>	<p>MOH records</p>	<p>Assumptions for achieving goal targets:</p> <p>That improvements in health resulting from clean water and adequate disposal will not be offset by epidemics or increases in disease from other causes</p>

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

ANNEX VII
Life of Project:
From FY 79 to FY 82
Total U.S. Funding \$480,000
Date Prepared: September 1979

Project Title & Number: RURAL WATER AND SANITATION 519-0209

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Purpose:</p> <p>To expand the number of rural poor effectively served by MOH potable water and sanitation facilities</p>	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <ol style="list-style-type: none"> 1. A viable financial and preventive maintenance plan in operation 2. Ten rural water systems, serving 13,000 persons, restored to full operation 3. 496,000 rural dwellers provided with more effective and dependable water and sanitation systems 4. 5-10 water systems using new technologies under construction 	<p>MOH records and visual inspection</p> <p>MOH records</p> <p>O&M Survey and Evaluation of Component I</p> <p>MOH records and visual inspection</p>	<p>Assumptions for achieving purpose:</p> <p>GOES interest in this project will continue and resources will be made available as needed</p> <p>MOH accepts maintenance plan and implements new maintenance strategy</p>

ANNEX VII

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORKAID 1020-28 (7-74)
SUPPLEMENT 1Project Title & Number: RURAL WATER SUPPLY AND SANITATION 519-0209Life of Project:
From FY 79 to FY 82
Total U.S. Funding \$480,000
Date Prepared: September 1979

PAGE 4

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS		MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Inputs:	Implementation Target (Type and Quantity) (US \$000)			Assumptions for providing inputs:
A. Technical Assistance	<u>AID</u> \$238	<u>GOES</u> --	Fiscal data of participating agencies	Host country support will be at stated levels and available on a timely basis
B. Local Training	96	5		
C. Salaries	--	85		
D. Commodities	82	140		
E. Administrative Costs and Vehicle Operation	--	147		
F. Other Costs	7	--		
G. Inflation	51	39		
H. Contingency	<u>6</u>	<u>--</u>		
TOTALS .	\$480	\$416		

1289

AID HANDBOOK 3, App 5C(1)	TRANS. MEMO NO. 3:32	EFFECTIVE DATE June 7, 1979	PAGE NO. 5C(1)-1
---------------------------	-------------------------	--------------------------------	---------------------

5C(1) - COUNTRY CHECKLIST

Listed below are, first, statutory criteria applicable generally to FAA funds, and then criteria applicable to individual fund sources: Development Assistance and Economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights?

Yes. The project will provide improved operation and maintenance of over 450 rural water systems serving approx. 82,000 rural families.

2. FAA Sec. 481. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the United States unlawfully?

No.

3. FAA Sec. 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement?

Yes.

4. FAA Sec. 620(c). If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government?

No.

5. FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?

No.

PAGE NO.	EFFECTIVE DATE	TRANS. MEMO NO.	
5C(1)-2	June 7, 1979	3:32	AID HANDBOOK 3, App 5C(1)

A.

6. FAA Sec. 620(a), 620(f); FY 79 App. Act, Sec. 108, 114 and 606. Is recipient country a Communist country? Will assistance be provided to the Socialist Republic of Vietnam, Cambodia, Laos, Cuba, Uganda, Mozambique, or Angola? No.
7. FAA Sec. 620(1). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression? No.
8. FAA Sec. 620 (1). Has the country permitted or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property? No.
9. FAA Sec. 620(1). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason? El Salvador has instituted the Investment Guaranty Program.
10. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters:
 a. has any deduction required by the Fishermen's Protective Act been made?
 b. has complete denial of assistance been considered by AID Administrator?
 El Salvador has not seized or imposed penalty against any U.S. fishing activities in international waters.
11. FAA Sec. 620; FY 79 App. Act, Sec. 603.
 (a) Is the government of the recipient country in default for more than 6 months on interest or principal of any AID loan to the country?
 (b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds? No.
12. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the percentage of the country's budget which is for military expenditures, the amount of foreign exchange spent on military equipment and the Project is not development loan or from Economic Support Fund.

AID HANDBOOK 3, App 5C(1)	TRANS. MEMO NO. 3:32	EFFECTIVE DATE June 7, 1979	PAGE NO. 5C(1)-3
---------------------------	-------------------------	--------------------------------	---------------------

A.12.

amount spent for the purchase or sophisticated weapons systems? (An affirmative answer may refer to the record of the annual "Taking Into Consideration" memo: "Yes, as reported in annual report on implementation of Sec. 620(s)." This report is prepared at time of approval by the Administrator of the Operational Year Budget and can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

13. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

No.

14. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget?

From information available to the Mission, El Salvador appears not to be having difficulty in meeting its UN obligations.

15. FAA Sec. 620A, FY 79 App. Act, Sec. 607. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?

No.

16. FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA?

No.

17. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it detonated a nuclear device after August 3, 1977, although not a "nuclear-weapon State" under the nonproliferation treaty?

No.

B. FUNDING CRITERIA FOR COUNTRY ELIGIBILITY1. Development Assistance Country Criteria

a. FAA Sec. 102(b)(4). Have criteria been established and taken into account to assess commitment progress of country in effectively involving the poor in development, on such indexes as: (1) increase in agricultural productivity through small-farm labor intensive agriculture, (2) reduced infant mortality, (3) control of population growth, (4) equality of income distribution, (5) reduction of unemployment, and (6) increased literacy?

El Salvador has demonstrated its commitment to involving the poor in development by undertaking various projects aimed at their needs in the agricultural, health, nutrition, housing, employment and other sectors. See Mission's CDSS of 1/30/79.

B.1.

b. FAA Sec. 104(d)(1). If appropriate, is this development (including Sahel) activity designed to build motivation for smaller families through modification of economic and social conditions supportive of the desire for large families in programs such as education in and out of school, nutrition, disease control, maternal and child health services, agricultural production, rural development, and assistance to urban poor? No.

2. Economic Support Fund Country Criteria

a. FAA Sec. 502B. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights? N. A.

b. FAA Sec. 533(b). Will assistance under the Southern Africa program be provided to Mozambique, Angola, Tanzania, or Zambia? If so, has President determined (and reported to the Congress) that such assistance will further U.S. foreign policy interests? N. A.

c. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made? N. A.

d. FY 79 App. Act, Sec. 113. Will assistance be provided for the purpose of aiding directly the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights? N. A.

e. FAA Sec. 620B. Will security supporting assistance be furnished to Argentina after September 30, 1978? N. A.

AID HANDBOOK 3, App 5C(2)	TRANS. MEMO NO. 3:32	EFFECTIVE DATE June 7, 1979	PAGE NO. 5C(2)-1
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5C(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable generally to projects with FAA funds and project criteria applicable to individual fund sources: Development Assistance (with a subcategory of criteria applicable only to loans); and Economic Support Fund.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE?
HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PRODUCT?

A. GENERAL CRITERIA FOR PROJECT

1. FY 73 App. Act Unnumbered; FAA Sec. 653 (b); Sec. 634A. (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that figure)?

Waiting period for Advice of Program Change for this project expired 9/26/79 without objection from Congress. (See cable STATE 255009)

2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonable firm estimate of the cost to the U.S. of the assistance?

See IV. B. Financial Plan

3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

Further legislation will not be required.

4. FAA Sec. 611(b); FY 79 App. Act Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per the Principles and Standard for Planning Water and Related Land Resources dated October 25, 1973?

N.A.

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?

N.A.

6. FAA Sec. 209. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.

Project component which provides training for mid-level water technicians was studied to determine regional project feasibility. Regional coordination exists but country needs are too different to combine into only one training course.

PAGE NO. 5C(2)-2	EFFECTIVE DATE June 7, 1979	TRANS. MEMO NO. 3:32	AID HANDBOOK 3, App 5C(2)
---------------------	--------------------------------	-------------------------	---------------------------

136

A.

7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

Project will improve technical efficiency of rural water system design, construction, operation and maintenance.

8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

The project will not significantly contribute to U.S. private investment abroad. U.S. private enterprise will provide technical assistance for project engineering activities.

9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.

The Government of El Salvador will contribute approximately 10% of the total project cost. The Government holds no excess Salvadoran currency.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

No.

11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the award of contracts, except where applicable procurement rules allow otherwise?

Yes.

12. FY 79 App. Act Sec. 608. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar, or competing commodity?

N. A.

B. FUNDING CRITERIA FOR PROJECT1. Development Assistance Project Criteria

a. FAA Sec. 102(b); 111; 113; 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas and insuring wide participation of the poor in the benefits of development on a sustained

The project will provide appropriate technology water system designs and will emphasize increased community participation in planning and executing rural water system construction. Operation and maintenance activities will be decentralized as village-level operators receive training and improve their skills. Curriculum and materials development for mid-level water technicians course will be done in cooperation with other C.A. countries who may send rural water personnel to El Salvador for training in deep well drilling and electric pump install:

137

ANNEX VIII

AID HANDBOOK 3, App 5C(2)	TRANS. MEMO NO. 3:32	EFFECTIVE DATE June 7, 1979	PAGE NO. 5C(2)-3
---------------------------	-------------------------	--------------------------------	---------------------

B.1.a.

basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

b. FAA Sec. 103, 103A, 104, 105, 106, 107.

Is assistance being made available: (include only applicable paragraph which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.)

(1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers;

N. A.

(2) [104] for population planning under sec. 104(b) or health under sec. 104(c); if so, extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical personnel, clinics and health posts, commercial distribution systems and other modes of community research.

The project focuses on village level activities which decrease number of breakdowns and maintain water quality for rural systems. The integrated approach to environmental health emphasizes installation and use of latrines as well as related health education activities and is a part of the low cost integrated rural health delivery system.

(3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;

N. A.

(4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:

N. A.

(i) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;

(ii) to help alleviate energy problems;

(iii) research into, and evaluation of, economic development processes and techniques;

(iv) reconstruction after natural or manmade disaster;

124

ANNEX VIII

PAGE NO. 5C(2)-4	EFFECTIVE DATE June 7, 1979	TRANS. MEMO NO. 3:32	AID HANDBOOK 3, App 5C(2)
---------------------	--------------------------------	-------------------------	---------------------------

138

B.1.b.(4).

(v) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

(vi) for programs of urban development especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

c. [107] Is appropriate effort placed on use of appropriate technology?

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to the Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"?

f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental and political processes essential to self-government.

g. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase or productive capacities and self-sustaining economic growth?

2. Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, including reasonableness of repayment prospects.

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

Appropriate technologies for rural water systems are limited by Salvadoran hydrogeological and demographic features. This project will permit experimentation in this area.

Yes. The GOES will contribute 46% of the total project costs (see IV.B. Financial Plan).

No.

Under this project Ministry of Health personnel will receive technical training in order to implement a new rural water systems operation and maintenance plan. The plan will be designed based on the results of a survey which will analyze all existing rural systems to determine O&M needs and problems.

The financial viability of Salvadoran rural water systems will improve as a result of the project.

N. A.

N. A.

127

AID HANDBOOK 3, App 5C(2)	TRANS. MEMO NO. 3:32	EFFECTIVE DATE June 7, 1979	PAGE NO. 5C(2)-5
---------------------------	-------------------------	--------------------------------	---------------------

3. Project Criteria Solely for Economic Support Fund

a. FAA Sec. 531(a). Will this assistance support promote economic or political stability? To the extent possible, does it reflect the policy directions of section 102?

N. A.

b. FAA Sec. 533. Will assistance under this chapter be used for military, or paramilitary activities?

AID HANDBOOK 3, App 5C(3)	TRANS. MEMO NO. 3:32	EFFECTIVE DATE June 7, 1979	PAGE NO. 5C(3)-1
---------------------------	-------------------------	--------------------------------	---------------------

140

5C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

- | | |
|--|--|
| 1. <u>FAA Sec. 602.</u> Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed? | Yes. Standard procurement regulations and good commercial practice will be followed under the project. |
| 2. <u>FAA Sec. 604(a).</u> Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him? | Yes. |
| 3. <u>FAA Sec. 604(d).</u> If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the United States on commodities financed? | Yes. |
| 4. <u>FAA Sec. 604(e).</u> If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? | N. A. |
| 5. <u>FAA Sec. 608(a).</u> Will U.S. Government excess personal property be utilized wherever practicable in lieu of the procurement of new items? | Yes. |
| 6. <u>FAA Sec. 603.</u> (a) Compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates. | Yes. |
| 7. <u>FAA Sec. 621.</u> If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the | Yes. |

129

PAGE NO. 5C(3)-2	EFFECTIVE DATE June 7, 1979	TRANS. MEMO NO. 3:32	AID HANDBOOK 3, App 5C(3)
---------------------	--------------------------------	-------------------------	---------------------------

A.7.

facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

8. International Air Transport. Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available? **Yes.**

9. FY 79 App. Act Sec. 105. Does the contract for procurement contain a provision authorizing the termination of such contract for the convenience of the United States? **Yes.**

B. Construction

1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest? **N. A.**

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable? **N. A.**

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the United States not exceed \$100 million? **N. A.**

C. Other Restrictions

1. FAA Sec. 122 (e). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter? **N. A.**

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights? **N. A.**

3. FAA Sec. 620(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-bloc countries, contrary to the best interests of the United States? **N..A.**

4. FAA Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the United States, or guaranty of such transaction? **N. A.**

AID HANDBOOK 3, App 5C(3)	TRANS. MEMO NO. 3:32	EFFECTIVE DATE June 7, 1979	PAGE NO. 5C(3)-3
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142

C.

5. Will arrangements preclude use of financing:

- a. FAA Sec. 104(f). To pay for performance of abortions or to motivate or coerce persons to practice abortions, to pay for performance of involuntary sterilization, or to coerce or provide financial incentive to any person to undergo sterilization? N. A.
- b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property? N. A.
- c. FAA Sec. 660. To finance police training or other law enforcement assistance, except for narcotics programs? N. A.
- d. FAA Sec. 662. For CIA activities? N. A.
- e. FY 79 App. Act Sec. 104. To pay pensions, etc., for military personnel? N. A.
- f. FY 79 App. Act Sec. 106. To pay U.N. assessments? N. A.
- g. FY 79 App. Act Sec. 107. To carry out provisions of FAA sections 209(d) and 251(h)? (Transfer of FAA funds to multilateral organizations for lending.) N. A.
- h. FY 79 App. Act Sec. 112. To finance the export of nuclear equipment, fuel, or technology or to train foreign nations in nuclear fields? N. A.
- i. FY 79 App. Act Sec. 601. To be used for publicity on propaganda purposes within United States not authorized by the Congress? N. A.

131



MINISTERIO DE PLANIFICACION
Y COORDINACION DEL DESARROLLO
ECONOMICO Y SOCIAL

C.I. 1465

San Salvador, 27 de septiembre de 1979.

ASUNTO: Solicitud de asistencia para
"Suministro de Agua Potable y Salubri-
dad en el Area Rural".

Señor Charles J. Stockman
Director de la Agencia de los
Estados Unidos para el Desarrollo Internacional
Presente.

Estimado señor Stockman:

El Gobierno de El Salvador, a través del Ministerio de Salud Pública y Asistencia Social, ejecuta actualmente el subprograma de Introducción de Agua Potable en el Medio Rural, el cual está comprendido en el Programa Estratégico Saneamiento Ambiental.

Considerando que nuestro Gobierno se ha propuesto cumplir con las metas de "Agua y Saneamiento para Todos", contemplado por el citado programa, el referido Ministerio necesita fortalecerse institucionalmente para incrementar su capacidad operativa; por lo cual se solicita el apoyo de esa Agencia Internacional a su digno cargo, a fin de alcanzar el objetivo antes expresado, a través de una asistencia financiera cuyo monto ascendería a U.S. \$ 479,981 (\$ 1,200.000), con la que se lograría lo siguiente:

- Realizar un estudio sobre la operación y mantenimiento de 464 acueductos existentes, como base para el diseño e implantación de un sistema de mantenimiento preventivo;
- Adiestramiento a técnicos de nivel medios, obreros y miembros de la comunidad; a través de cursos de adiestramiento cortos;
- Adiestrar a promotores comunales;
- Captar asistencia técnica de expertos en Ingeniería para el diseño de 5 a 10 sistemas de abastecimiento de agua potable al sector rural, utilizando tecnologías apropiadas.

Por la importancia que reviste el mejoramiento de las condiciones de salud del sector rural, al que el Gobierno le otorga atención prioritaria, atentamente solicito a usted se digne interponer sus buenos oficios a fin de obtener la asistencia en mención, para formular y llevar a la práctica el pro-

144

MINISTERIO DE PLANIFICACION
Y COORDINACION DEL DESARROLLO
ECONOMICO Y SOCIAL

C.I. 1465

...2

yecto de "Suministro de Agua Potable y Salubridad en el Area Rural", en re-
ferencia.

Agradezco a usted anticipadamente su consideración favorable de la presente
y aprovecho la oportunidad para referirle las muestras de mi elevada estima.

Jorge Alberto Escobar
Subsecretario
Encargado del Despacho.

133



ANNEX X
AGENCY FOR INTERNATIONAL DEVELOPMENT
UNITED STATES OF AMERICA A. I. D. MISSION
TO EL SALVADOR
C/O AMERICAN EMBASSY
SAN SALVADOR, EL SALVADOR, C. A.

1462

ACTION MEMORANDUM

Date: September 24, 1979
Reply to: *BH Masters*
Attn. of: Bernard H. Masters, Development Planning Officer
Subject: PROJECT AUTHORIZATION
To: Mr. Charles J. Stockman, Mission Director

Your approval is required for a Grant of \$480,000, subject to the availability of funds, from Allotment 948-50-519-00-69-91, Appropriation 72-1191021.8 Health appropriation to El Salvador for the Rural Water Supply and Sanitation Project - N° 519-0209.

Discussion: The project consists of activities designed to assist the MOH Bureau of Health Engineering and Rural Water Supply (DAR) to expand and maintain its rural water supply and sanitation systems. The project emphasizes decentralization of many DAR activities away from San Salvador to the regional offices by improving the technical capacity of regional and individual community personnel. The project advocates a development of a fully integrated approach to rural water supply, including effective and meaningful community participation, installation of latrines, health education, and a balanced program of preventive and corrective maintenance.

Justification to Congress: Congressional Notification Expiration Date is September 26, 1979.

Clearances Obtained: State 244447 dated September 18, 1979 indicates that obligation of funds may be incurred September 27, 1979. The regional legal advisor was consulted September 19, 1979.

Recommendation: That you sign the attached Project Authorization.

137