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AN ASSESSMENT OF USAID/EL SALVADOR'S PILOT POTABLE WATER AND ENVIRONMENTAL SUPPORT PROJECT

Prepared for the
Infrastructure and Regional Development Division (IRD)
U.S. Agency for International Development
El Salvador

by

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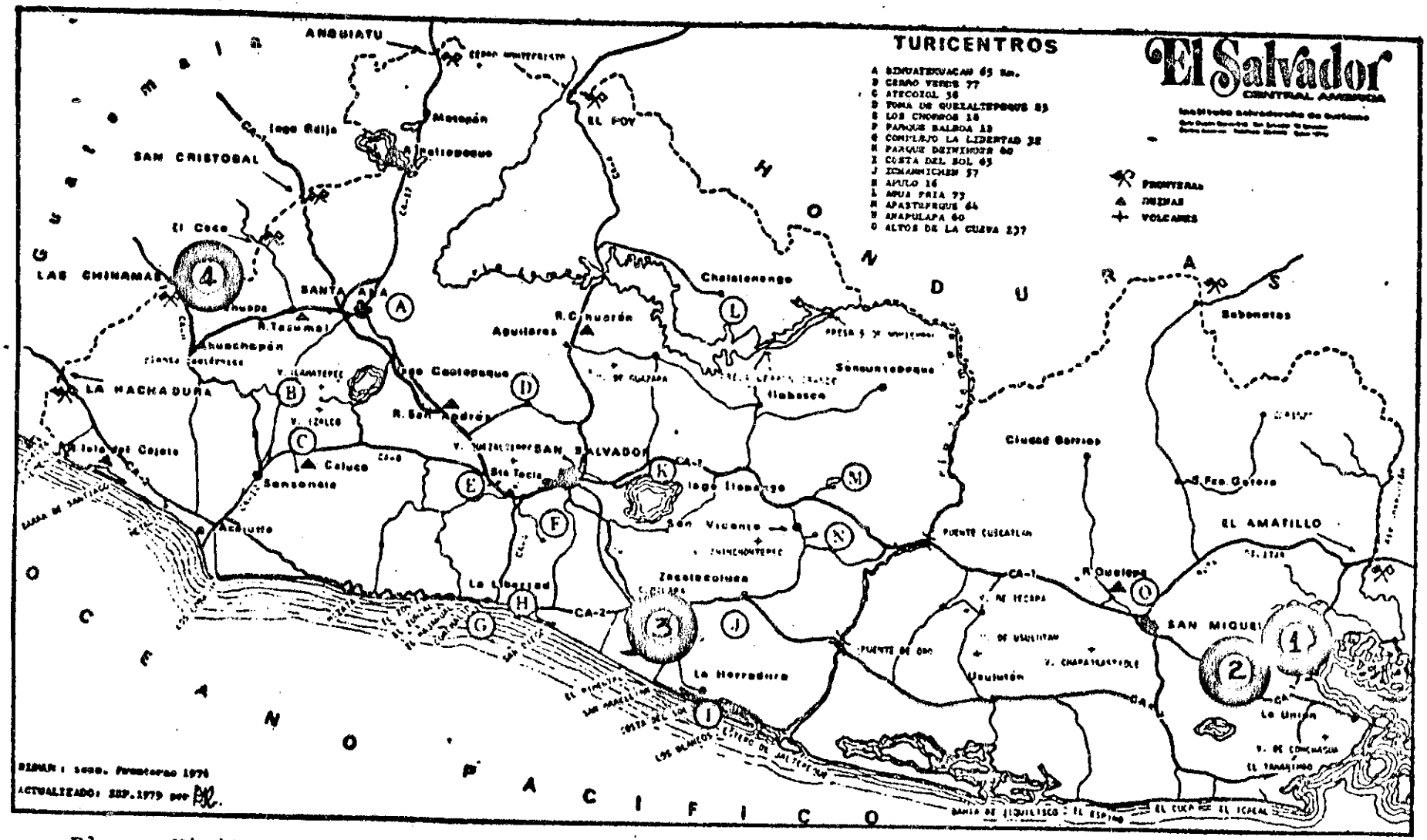
Water and Sanitation for Health Project

May 1988



Places Visited

(1) San Alejo, La Unión
(2) San José
(3) Tihuilocoyo y Astoria
(4) Las Chinamas

TABLE OF CONTENTS

ACRONYMS

AID	U.S. Agency for International Development
ANDA	Administracion Nacional de Acueductos y Alcantarillados (National Water and Sewer Authority)
ANDA/MU	Management Unit for the Pilot Project within ANDA
DIDECO	Direccion de Desarrollo Comunal (Directorate for Community Development/Ministry of the Interior)
DJC	Desarrollo Juvenil Comunitario (Save the Children Federation)
ESF	Economic Support Funds
F/X	Foreign Exchange
GOES	Government of El Salvador
IDB	Inter-American Development Bank
IRD	Infrastructure and Regional Development Division (of USAID)
MOH	Ministerio de Salud Publica y Asistencian Social (Ministry of Public Health and Social Aid)
MU	Management Unit for the Pilot Project within ANDA
PAHO	Pan American Health Organization
PLANSABAR	Plan Nacional de Saneamiento Basico Rural (National Agency for Rural Sanitation)

PRASAR	Proyecto de Agua y Saneamiento Rural (USAID-funded Rural Water Supply and Sanitation Project in Honduras)
UNDP	United Nations Development Plan
UNEPAR	Unidad Ejecutora del Programa de Acueductos Rurales (Ministerio de Salud Publica y Asistencia Social - Guatemala)
PVO	Private Voluntary Organization
SETEFE	Secretaria Tecnica de Financiamiento Externo (Technical Secretariat for External Finance)
TA	Technical Assistance
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development (The mission to El Salvador)
WASH	Water and Sanitation for Health project

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EXECUTIVE SUMMARY

This report presents the findings of an assessment conducted by WASH in May 1988 of USAID/El Salvador's Pilot Potable Water and Environmental Support Project. The assessment includes a review of the on-going pilot project and recommendations for its expansion.

In 1986, USAID/El Salvador, embarked on a three-phase Special Impact Domestic Water Project targeted on water needy areas outside of normal GOES rural water and sanitation development activities. Phase I (conceptualization and mobilization), and Phase II (pilot project) were implemented starting in FY86 using a USAID concept paper for guidance. Phase III, originally scheduled to be implemented in FY88, was to be a separate project based on lessons learned in the pilot project. A USAID management decision to limit new project starts was taken in FY87. Implementation of the pilot project was funded largely by local currency from the Extraordinary Budget, and some foreign exchange from the Mission's Public Services Restoration Project (519-0279).

As with virtually every other aspect of life in El Salvador in recent years the civil strife beginning in 1979, has taken its toll on the health of the rural population. Water-related diseases head all available lists of leading causes of morbidity and mortality. Data show that diarrhea is the cause of 25% of the deaths of children under five years of age, and that it is the number one cause of morbidity for both the under one and under five-year-old age groups. One third of El Salvador's children under five suffer from diarrhea, with the prevalence being highest in rural areas. For children under one year of age, the prevalence of diarrhea is over 50%. In 1982, 74% of infectious diseases reported for all ages were water-related.

Meanwhile, the percentage of the rural population having access to safe drinking water has dropped precipitously from 30% in 1984 to 13.5% in 1988. The goal of AID's Central America Initiative for El Salvador was to achieve access to safe and adequate water supply for 33.3% of the rural population by 1989. Few new water projects, lack of

maintenance on existing projects, high population growth, and civil strife are all blamed for this alarming situation of inadequate water supply.

USAID/El Salvador's pilot water project is especially timely and appropriate. It is the only effort reaching communities with fewer than 300 inhabitants. Normally, rural water and sanitation development is addressed by the National Agency for Rural Sanitation of the Ministry of Health (PLANSABAR), but only in communities with populations from 300 persons to 2,000. The National Water and Sewer Authority (ANDA) addresses water and sanitation development in the urban areas with populations of 2,000 or more. The establishment of a Management Unit within ANDA to implement the USAID pilot project has effectively extended the GOES water and sanitation mandate to all population levels. To date, 430 wells with handpumps have been installed, and improvements to 44 larger village systems have been completed under the pilot project.

If complemented by additional technical staff, and important attendant components including community participation, health education, establishment of user-fee recovery systems in participating communities, and training of handpump and system operators, an expansion of the pilot project could make a very important contribution to improving health in rural El Salvador. Recommendations made by the WASH team include strengthening the Management Unit with one sanitary engineer and three civil engineers in order to assure technical soundness of design work, and to more effectively monitor supervision and construction provided by the private sector under contract. In addition, field promoters, numbering one per every 30 project communities, should be hired to carry out a two-track approach to community participation and health education, so that health objectives sought under the project can be achieved and sustained. The field promoters would be expected to: 1) interface directly with the participating communities to identify a committee that would assume ownership of the well/handpump and take responsibility for its maintenance, and 2) to work with this committee before, during and after construction to assure that community participation, and pump

operation and maintenance objectives are reached and sustained. They would also initiate health education activities, but would coordinate them through community-based development workers. A participatory, problem-solving approach to health education would be employed rather than a message-giving approach. Next, field promoters would engage department-level, or regional-level offices of the various ministries and agencies involved in rural development in seeking ways to coordinate health education at the local level.

The alarming statistics on water-related diseases and the corresponding decline in access to safe and adequate water supply in rural El Salvador, would seem to warrant reconsideration of the Mission's position on new project starts. In any event, an expansion of pilot project activities should be pursued. If an expanded water project cannot be funded through Project 519-0279, then the WASH team recommends that it be funded through a Private Voluntary Organization (PVO) such as Save the Children which is already involved in the pilot project. In fact, it would be ideal if Save the Children's present work could be complemented by a larger parallel project that would promote community participation and be limited to water and sanitation. The Management Unit of ANDA could continue to provide the technical inputs, and Save the Children could provide training in community promotion and organization skills to Management Unit promoters. Save the Children could also provide leadership in implementing site selection.

I. Project Summary and Description

A. Summary Description

In early 1988, WASH was requested by USAID/El Salvador to assess an on-going pilot project providing potable water to small rural communities and secondary towns, and to make recommendations based on the assessment for expanding the activity. USAID's pilot project is based on work provided by WASH under a consultancy carried out in 1986, and a Mission concept paper titled "Domestic Water in El Salvador" prepared by Charles Brady in October 1986. The assessment was conducted between May 1, and May 27, 1988 by a three-person WASH team using a scope of work provided by USAID/El Salvador.

Over 430 drilled wells with handpumps in rural areas and improved water and sewer systems in 44 larger villages are being provided under the pilot effort. Funding for the pilot project has come from funds out of the Extraordinary Budget, or local currency funds as they are commonly known. These are funds owned by the GOES that are generated from the sale of PL480 and Section 416 food commodities, and from ESF investments. Local currency funds invested to date total C45 million ($9 million). In addition, $1.5 million have been provided from the Mission's Public Services Restoration Project (519-0279) for the purchase of drilling equipment (10 drilling rigs with spare parts) and handpumps. USAID staff level proposals over the FY89 and FY90 period contemplate additional investments of $10 million for the import of handpumps and spare parts (not under project 0279), and C80 million ($16 million) of local currency to cover costs for community participation, health education, and well/handpump installation in 200 rural communities. Other costs to be covered by local currency funds include the design, supervision, and construction work necessary to improve or restore water and sewer systems in 50 larger villages.

The basic aim of the pilot project is to target water needy rural areas, especially those not encompassed in the GOES' traditional water and sewer development programs. The project seeks to introduce a low level service rather than a full fledged piped system in isolated or very small

communities. A second component of the pilot project seeks to design and construct (or improve) water systems in larger villages.

The importance of water and sanitation interventions in El Salvador are made poignant by available health statistics which show that between 1971 and 1980 about 25% of deaths of children under five years of age were attributed to diarrhea and that diarrhea was the number one cause of morbidity for children under one, and under five years of age respectively. Similarly, in 1980, 74% of reported clinic consultations for children under five years of age were diarrhea related, and in 1982 74% of reported infectious diseases for all ages were water related.

These grim statistics are underscored by the fact that the percent of the rural population with access to safe water (percent covered), has dropped alarmingly from 30% in 1984, to 20.1% in 1986, and down to 13.5% in 1988. This is in sharp contrast to AID'S Central America Initiative goal for 1989 of 33.3% for rural population coverage in El Salvador. The internal conflict, high population growth rate, and lack of maintenance for existing systems are blamed for the precipitous drop in coverage.

The rural demand for access to safe and convenient sources of water is huge in El Salvador. Development entities such as CONARA, DIDECO, and Save the Children report that water is the most sought after intervention. In 1988, about 2,501,000 rural inhabitants have no access to safe and convenient water. About 60% of that population lives in small villages or caserios for which a handpump would be an appropriate intervention. About 10,240 handpumps would be needed to fully satisfy this demand, or about 24 times as many pumps as are being being provided under the pilot project.

If the USAID pilot project is expanded to planned FY89 and FY90 levels, and other current donor obligations are fully invested, coverage of the rural population would reach only 25% by 1991. Planned investments in the sector beyond current obligations would still leave over 60% of the rural population with no access to safe water by 1995.

B. Background

1.The Pilot Project

USAID/ES' pilot project is intended to create more opportunities for the large number of communities that lie outside the GOES' rural and urban water and sanitation development systems to acquire access to these services. It is demonstrating better ways of delivering water service in general, and specifically making it available to smaller, rural communities. A Management Unit has been established within ANDA with responsibility for implementation of project activities. The innovative use of the private sector by the Management Unit to carry out design work and implement projects has been a major success. A working relationship with the private sector has been firmly established. The wells/handpumps and larger village systems installed have been well received by beneficiaries. Lacking in the pilot project, however, is sufficient focus on important attendant components including maintenance and operations installations, establishment of user fee recovery systems, sanitation and health education at the community level, water source development and biological testing, sanitation, and training for water system operators.

If fully expanded to planned FY89 and FY90 levels, the potable water project will have a national focus, and will effectively provide a means of addressing that segment of the rural population not now eligible for potable water and sanitation services under the ANDA and PLANSABAR mandates. Moreover, the project will have a health and sanitation focus whose purpose will be to improve the health of this segment of the rural population, i.e. communities of 300 persons or less.

The demand for safe water and sanitation will still far outstrip the project's reach. At best, the project will set an example for a national policy which, we would hope, would seek to eventually provide all of El Salvador's people with access to safe water and sanitation.

The original concept paper prepared by Charles Brady in October 1986, on which the pilot project is based had as its principal aim the construction of water systems that otherwise would not be done under normal GOES programs. This special impact focus proposed targeting such communities with drilled wells and handpumps, and water systems in larger villages where appropriate. Identifying communities to start out in was an easy matter apparently, as there was a large backlog of requests in ANDA and PLANSABAR for water systems, especially in communities where unfavorable conditions prohibited normal piped systems. Indeed, moving forward in the pilot project was never a problem as the demand for water is extremely high. The National Commission for Areas Restoration (CONARA) conducted a needs analysis in 1987 of 222 of El Salvador's 262 municipalities in which are located 5,475 small communities with a population of 300 or less (a municipality in El Salvador is equivalent to a county in the United States). Results of the survey show that by far and away, the most expressed need of the communities in the municipalities surveyed is potable water (see annex 5). Historically, rural development agencies, including the Directive of Community Development (DIDECO), Save the Children, and USAID itself have received requests for water systems from communities. An example of this is a current list of communities requesting water systems maintained by DIDECO. This list contains 189 communities totaling 53,930 families. If addressed by well/handpump intervention, these 189 communities would require 2,157 handpump installations (@ one handpump per 25 families), or almost five times as many as are being installed in USAID's pilot project. This is only one list. Similar expressions of demand are available from virtually every entity or agency working in rural development in the country. And what groups like Save the Children are learning is that the successful installation of handpumps generates more demand in the local areas.

USAID's successful relationship with ANDA, as demonstrated by the evolution of the Management Unit, in large part arose from ANDA's inability to respond to requests from some larger villages for water and sewage system repair and improvement. In effect, ANDA agreed to address rural water supply if USAID provided it funds to improve or repair

existing water systems in larger villages. ANDA's inability to meet the demands of some of the larger villages stems from the fact that urban areas unable or unwilling to meet ANDA's water management charges (which are set to recover both capital costs and maintenance costs) are not potential income earners for ANDA and are therefore not considered. USAID accepted ANDA's quid-pro-quo which assured ANDA's entry into rural water supply. USAID and ANDA will continue to work in this manner, addressing primarily rural water supply, but also taking on some larger village system repair and improvement activities that fall outside of its normal operations mandate, and for which would USAID will provide Extraordinary Budget, local currency funding.

2. GOES Policies and Programs

a. History of Water and Sewage Development During the Period of Civil Strife, Beginning in 1979

The lack of sufficient quantities of safe water in El Salvador is well known. The availability of potable water in rural areas has been declining since the beginning of civil strife in 1979. The percentage of the population having access to safe water was 30% in 1984, 20.1% in 1986, and, according to latest figures available, about 13.5% in 1988. The rural population in 1986 was 2,796,261 out of a total population of 4,845,588. The percent of the rural population in 1986 with access to safe water provided by piped systems was 20.1%, i.e. 562,048 people, according to ANDA's "Boletin Estadistico 1986 Edition" and WASH Report No. 209. The rural population not served in 1986 was 2,234,213 (79.1%). Assuming a population growth rate in El Salvador of 1.7% (which is the estimate currently used by USAID's Population Office, and is based on a current growth rate of 2.5% less 0.8% out-migration due to the state of the economy and the conflict) the rural population today would be approximately 2,892,142. Two sources provided the WASH team with information on rural access to safe water in 1988. These were:

a) Pan American Health Organization (PAHO) which reports that the:

- Number of rural systems working in 1988 = 313
- Rural population served = 192,775
- Rural population in 1988 (est) 2,892,142
- Percent Covered = 6.7%

b) PLANSABAR which reports that the:

- Number of rural systems in place = 323
- Number of systems not functioning = 35
- Number of systems actually working = 288
- Rural population served = 327,000
- Rural population in 1988 (est) = 2,892,142
- Percent Covered = 11.3%

To fully illustrate the gap in demand it is necessary to factor in coverage provided by handpumps under the pilot project. This shows the following:

c) Wells: Pilot project = 430 well/handpumps

- 1 well serves 25 houses of 6 persons each = 150 persons per well.
- 430 X 150= 64,500 people served;
- Rural population in 1988 (est) = 2,892,142
- Percent covered = 2.2%

When these sources are combined, current rural coverage is between 8.9% and 13.5% of the estimated 1988 rural population level. What both these sources show is that there has been a precipitous drop in rural coverage by more than 50% of that covered in 1984, i.e. from 30% in 1984 to between 9% and 14% in 1988. This is an alarming situation that falls in sharp contrast with AID's Central American Initiative (CAI) goal for 1989 for increasing by 25% the number of individuals covered in 1984 by safe water. The goal for El Salvador, which remains static (see Figures 1 and 2), is 33.3% of the rural population.

Health indicators also reflect the need for adequate

Figure 1

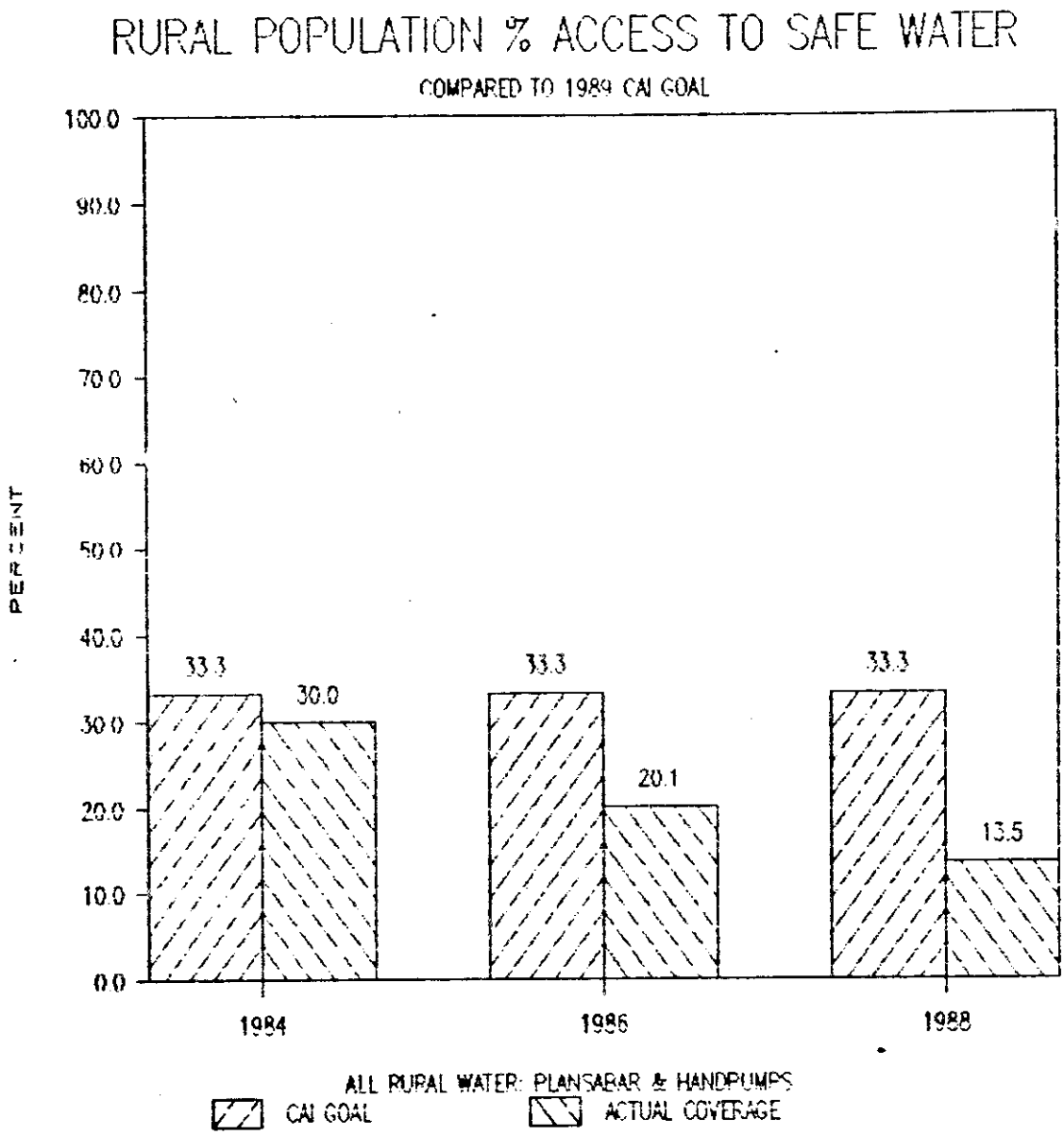
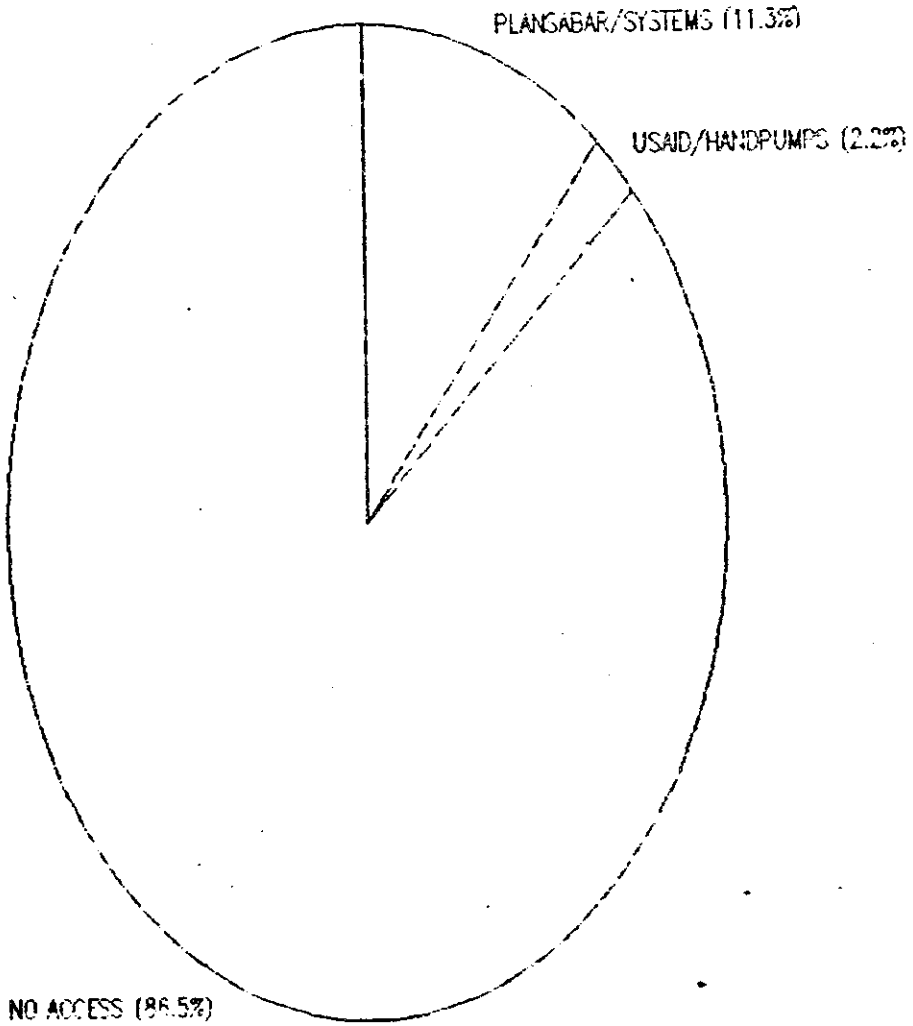

RURAL POPULATION % ACCESS TO SAFE WATER
COMPARED TO 1989 CAI GOAL
PERCENT
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
33.3
30.0
33.3
20.1
33.3
13.5
1984
1986
1988
ALL RURAL WATER: PLANSABAR & HANDPUMPS
CAI GOAL
ACTUAL COVERAGE

Figure 2

RURAL POPULATION % ACCESS TO SAFE WATER

IN EL SALVADOR IN 1988



country. In the nine-year period 1971-1980, approximately 25% of deaths of children under five-years of age were attributed to diarrhea and diarrhea was the number one cause of morbidity for both the under one and under five age groups. In the last half of this period, 1976-1980, figures show that while morbidity due to diarrhea remained more or less constant (3,432.2 in 1976 compared to 3,068.4 per 100,000 in 1980), mortality decreased by more than a third, thereby suggesting improved treatment but no significant increase in preventive measures. In 1980, 74% of clinic consultations for under fives were still diarrhea-related and in 1982 74% of infectious diseases reported for all ages were water-related.

More recent data show little change in the role that water-related diseases play in El Salvador. A 1985 study by FESAL reported that more than third of children under five years of age suffer from diarrhea. The prevalence was highest in rural and marginal urban areas. The prevalence rate for one-year-olds was over fifty percent (53.3%). In 1987 intestinal parasites and diarrhea were number one and two respectively in frequency of transmissible disease. And diarrheal disease remains the leading cause of morbidity and mortality among children after the first six months of life.

ANDA

Since its founding in 1961, the National Administration for Water Supply and Sewers (ANDA) has been El Salvador's national agency for providing and managing water supply and sewage services to urban and semi-urban areas of the country. It's traditional mandate has been to provide and manage such services in communities of 2,000 inhabitants or more. Originally, ANDA was in charge of the rural areas too, but in 1971 this responsibility was delegated to the Ministry of Public Health and housed in the Environmental Sanitation Division until 1976, when it was shifted to the Engineering Division. Finally in 1980, it was placed within a new section in the Ministry of Health called the National Basic Rural Health Plan (PLANSABAR).

Institutional coordination arrived at between USAID and

ANDA during phase I of the pilot project (conceptualization and mobilization phase) included creating an advisory unit in 1986 to be the implementing entity for this pilot project. The unit has become known as the Management Unit (MU). Creation of the MU in the pilot project has had the effect of extending ANDA's mandate from urban areas of 2,000 inhabitants and above to include the rural communities of 300 people or less. This extension of service essentially closes the gap in mechanisms available to the GOES to provide safe water to all of El Salvador's people, although it falls far short of closing the gap in demand. To manage its normal mandate in urban areas ANDA has a staff of about 4,000. The MU, to carry out its work, has a staff of fourteen, consisting of six drivers and eight professionals, of which only four are engineers.

The MU, staffed at its current level, is only one year old. In its first year, 1986-87, the MU had only a manager and an assistant manager. Considerable work has been achieved by the unit in its two years of existence. It was able to use ANDA's contracts as models for the design and construction contracts used in employing private sector firms, but it had to develop contract models for the supervision work. The MU now has a list of 64 approved or pre-qualified firms to carry out design, supervisory and construction work. The MU uses ANDA's design norms, which the sanitary engineer on the WASH team checked and found to be adequate for the rural systems considered in the project.

Presently, design work carried out by a contractor is first checked by one of the MU's engineers, then a technical revision is done by the Design Department of ANDA. This means that the MU must depend on the good will and favorable disposition of that Department. It would be more efficient if the MU had its own technical capacity to do such work. In other words, the need of an experienced sanitary engineer within the MU is obvious, not only for this task, but for other similar ones.

PLANSABAR

Currently housed within the Ministry of Public Health (MOH), water and sewage supply to larger rural towns with 300 to 2,000 inhabitants has been and continues to be PLANSABAR's mandate. Even though ANDA and PLANSABAR have had similar mandates (providing water and sewage) no coordination has ever existed between them; each has worked separately and independently of the other. At present, PLANSABAR has 20 engineers. In recent years, PLANSABAR has been working mostly in the implementation of Inter-American Development Bank (IDB) funded projects.

PLANSABAR is presently implementing a $21 million loan from IDB complemented by $7 million in counterpart funds provided by the Extraordinary Budget for the construction of 100 community water systems in communities ranging in size from 300 people to 2 ,000 people, and installing 75,000 latrines for about 450,000 people. The implementation of the project has been severely delayed. The loan agreement was signed in September 1985, and as of January 1988 only $13,000 of the first disbursement had been utilized. (As of January 31, 1988 the overall physical progress of this program was only 2%). Meanwhile, PLANSABAR has drawn down $1,947,500 in counterpart funds for administrative costs.

This poor implementation record was the motivating force behind President Duarte's December 12, 1987 decision to move PLANSABAR out of the Ministry of Public Health to ANDA. SETEFE was charged with heading a committee of MOH, ANDA, USAID, and IDB representatives to study, plan, and implement the transfer. The USAID has advised the GOES that it will withhold approval of any further disbursements of Extraordinary Budget funds to PLANSABAR as counterpart funds to the current IDB loan after July 1988 until PLANSABAR is transferred out of the MOH. The transfer is expected to take place sometime in the next three months. The USAID Mission believes that PLANSABAR's difficulty stems from its being lodged in the MOH, which in the Mission's view does not list PLANSABAR among its priorities. As a result, PLANSABAR's work has been severely hampered. Bureaucratic procedures delay materials purchases, and program support such as

vehicles, is lacking. In fact, the MOH diverts resources from PLANSABAR for other MOH requirements.

The UNDP is funding PLANSABAR to carry out hydrological studies in the country. Data from these studies are used by the MU in selecting sites for well drilling. PLANSABAR has four regional offices staffed with at least one engineer for operations and maintenance, and two more for supervision throughout each region. Water quality control is also carried out in each regional office.

PLANSABAR's mandate has never extended down to communities under 300 inhabitants mainly because it levies charges to recover its maintenance costs. PLANSABAR believes that small communities will not be able to pay these costs, and they are therefore excluded from its program focus. This fact not withstanding, PLANSABAR's maintenance record is abysmal in its mandate areas. Of 323 water systems they are presently managing, thirty-five are out of order because of lack of maintenance, and others are probably not working well. Herein lies much of the blame for the falling rates of access to safe water in rural areas. Bringing PLANSABAR's existing systems into good repair is probably the highest cost/benefit intervention that ANDA could undertake in the short term.

Recommendation # 1: When the transfer of PLANSABAR to ANDA is completed, that ANDA should immediately undertake a technical survey to (a) put back into commission the 35 systems not working, and (b), bring any other systems not fully functioning into good repair.

Places Visited

The WASH team made field visits to communities in four of the six priority areas targeted in the pilot project. According to the Concept Paper on which the pilot project is modeled prepared by Charles Brady and dated 10/3/86, five areas would be targeted under the handpump component of the project, including (1) Agrarian Reform Phase I Haciendas, (2) USAID school construction sites, (3) National Plan geographic

areas, (4) displaced persons camps or areas, (5) selected communities where it is obvious the GOES will not be able to meet domestic water requirements for the next five years. Under the Water Systems component, a sixth area would be targeted and it would cover small and medium-sized water systems that could be designed and implemented quickly. The WASH team was able to visit example projects in the handpump component of the pilot project under the following components: (1) Agrarian Reform Haciendas, (2) USAID School construction sites, and (3) selected communities not able to have its domestic requirements met by the GOES. The team was also able to visit one beneficiary community under the Water System component of the project.

The team's overwhelming impression of systems completed in the pilot project is highly favorable, especially the handpump component in the eastern provinces. In this component, well/ handpump systems provided to group (5) target communities were especially impressive. The team visited nine functioning handpump sites in the Department of La Union in Canton San Jose, and Canton El Caraon. The handpumps in these sites were being used so heavily by residents during the team's visit that their contribution to the community's well being, if not happiness, was obvious. At each site, a steady stream of users taking water was the norm, and it was readily apparent that it was not a "for show" type of use, but indeed genuine. The aridness of these two cantons tell a visitor, without asking, that water is a precious commodity, and that prior to the installation of these handpumps, was collected and carried with great effort. Where water was once available at a kilometer's or more distance, it is now available within 50 to 150 feet to most people in the site areas. Apparent also is that the quantity of water a household is now able to use is much higher because it is more readily available. That it is safer water than that previously collected from open wells or creek beds goes without saying in this rocky, dry, moonscape. In short, this component of the project may already be deemed a success, in the team's view. Once complemented with health education and maintenance elements, an important and sustainable development step will have been made in the community.

To observe that the bulk of the target communities in the handpump component of the pilot project are in these arid areas, as is indeed the case, is to recognize that this project effort is an excellent one. The handpump these thirsty communities receive goes to the heart of why there is a conflict in El Salvador: the country's rural poor in small, scattered communities have been ignored. The handpump component of this project redresses that long standing injustice in a measure that is not small for these poor communities. To be sure, a sustained effort to provide something as basic as water to these communities would go a long way in helping to reduce the alienation that comes with seeing ones basic needs ignored.

In the observed communities in these two cantons, a strong, self-help component was apparent. In one case in Canton San Jose, the team saw a newly built access road of 1 1/2 kilometers, built by the community's volunteer labor to bring in the well drilling rig. Cut through considerable rock and sloping terrain, and by volunteer manual labor, the road demonstrates the sincere desire of the beneficiary community to receive this help. In a nearby case, an access road has had a secondary affect on the local transport industry. Three bus companies will keep the road up now that they are able to extend their service to more people, and thus expand their customer base.

The San Jose and El Caraon canton communities visited were under Save the Children's Impact Area project. Save has done an admirable job of organizing the communities, and deserves considerable credit for the success of the handpump project in these two cantons. The pilot project's originators and the efforts of its people (the ANDA Management Unit especially) deserve considerable credit as well.

So striking and impressive is the impact of these handpumps on the local communities visited that quantifiable data on the water use almost seems to be begged for. A serious effort to quantify how much water households use before a well/handpump system is put in place, and after,

would reveal much about rural household use of water when it is available in convenient and adequate quantities. Such an effort might also reveal useful information on health impact.

The team observed some contrast of impact of well/handpump installations in the Agrarian Reform Haciendas. The team visited reformed hacienda communities in Astoria and Tihuilocoyo. The contrasting feature here is that the communities were not as enthusiastic over the handpumps as were the communities in La Union. The WASH team recognizes that reformed haciendas were targeted for reasons beyond the control of the ANDA/MU. However, it was observed that these two communities would have preferred piped house connection systems. In fact, they had requests in with PLANSABAR, but were unlikely to ever receive piped water from PLANSABAR because of their comparative small size, and PLANSABAR's limited resources. The installation of the well/handpumps is seen as a temporary solution in these cases, as opposed to the permanent solutions the handpumps provide in the La Union communities. At some point in time, the handpump can be removed from the well and an electric pump with an elevated tank and piped house connections can be put in. It was also observed that almost all the homes in these two communities had their own water source in their backyards, usually a small, open dugwell. People in the area also complained of the slightly oily taste of the handpump water.

The implementation of health education in those communities would have some impact on the use of the handpump water, but would probably be insufficient to fully supplement the convenience of the backyard dugwells. Selection criteria that put reformed hacienda communities at a lower level of priority and selected communities like those in La Union on a higher level would increase the impact of the handpump component of the project.

Finally, the team visited one example of an improved system under the water systems component of the project, in Las Chinamas of Ahuachapan Department. This community of approximately 2,000 persons was the beneficiary of a new storage tank of 300 cubic meters capacity and nine km of line

connecting the system to the main system in the town of Ahuachapan. A 50 cubic meter tank had earlier served the community with a similar but smaller diameter connection to the main system. The main system actually serves three communities together, Las Chinamas being the third in line. The original tank, and its small diameter input line, were insufficient to provide water to Las Chinamas' 200 houses. Because Las Chinamas is the last community on the system, and because of the small diameter input line serving its storage tank, almost no water reached its tank. It is not clear who constructed the original system. The new system, with its larger input line is now expected to provide adequate and continuous service to Las Chinamas. This community is very grateful for the pilot project's work. Under the original system only 45 houses had been connected. New house connections under the new system will be made at a cost of C850 to each household, payable to Las Chinamas' water committee. A user fee has yet to be determined, but was on the committee's agenda for early consideration once the new system was providing water. At the time of the visit, the tank had been recently completed and filled only once. Disinfection of the tank remains to be done before the system is put into full operation. This component of the project is well conceived, and is making water and sewage service available to larger villages that otherwise do not meet ANDA's or PLANSABAR's mandate criteria, or operation and maintenance charges. It is worth noting that many of these communities are quite large, and fit into ANDA's mandate description. Therefore, the team has not included these communities and populations in its discussion of rural population covered.

Recommendation # 2: That improved systems under the pilot project, and any expansion of it over FY89 and FY90 be officially moved to ANDA or PLANSABAR for maintenance and operations upon completion.

Save The Children

Save The Children, known as Desarrollo Juvenil

standards throughout the country. The Department is also responsible for maintaining standards related to food control, garbage, vectors, and solid and liquid wastes.

A trained engineer is in charge of this department which includes 250 field inspectors based in municipalities throughout the country. The role of these inspectors includes sampling of municipal and rural water systems. The director expressed that presently the work of the department is greatly hampered by the lack of resources for transportation (lack of vehicles, gasoline, perdiems, transportation reimbursement, etc.) In the past, health workers were able to use public transportation freely with government passes. However, since this privilege was revoked a few year ago, inspectors have been unable to carry out their work adequately outside of municipal areas throughout the country.

The Director is also concerned with maintaining the performance standard of the field inspectors and organized a series of in-service seminars for department field staff in 1987. For this training a manual on the quality of water for drinking purposes was developed ("Apuntes sobre la Calidad de las Aguas de Uso Potable") which could serve as a potential resource to the ANDA Management Unit.

Future projects of the Department include a nation-wide water quality control program with funding of the Italian government.

As the Environmental Sanitation Department is charged with the task of carrying out the official responsibility of the Ministry of Health in maintaining water control standards and, therefore, considers it part of their role to supervise ANDA's work in water quality, it would be advisable for the Management Unit to establish contact with the Department. Furthermore, assistance to support the Department in their work in water quality maintenance should be considered.

It is also important to mention that the Ministry of Public Health is presently preparing to give more attention to health service delivery in rural areas. A Division of

Primary Health Care Services is now being formed. It is suggested that the MU also consider ways to coordinate activities with this new division.

Role of Private Sector

To accelerate project implementation, the ANDA/MU has turned to the private sector. Contracts have been awarded for design work and construction of water systems including well drilling, and supervision. The average professional fee for these contracts are estimated on the basis of a percent of the total cost of the project. The normal figures used by the ANDA/MU are as follows:

Design: 8 to 10%
Supervision: 6 to 8%

According to the contents of WASH Field Report No. 187, Section 2.2.7 Consulting Engineer, "individual services of professional engineers can be contracted (in El Salvador) at a salary cost of C8,000 ($1,600) per month." In one of the contracts examined, the supervisor of the construction of a water system improvement project is receiving the equivalent of C28,698.26 ($5,739.65) per month. This represents 3 1/2 months salary of one supervisor working full time at the contracting agency. This suggests that (1) there is no established fee schedule to guide costs, and (2) there is improper and incomplete review of contractors' fees. There are two issues to consider in remedying this situation. First, it is essential that a fee schedule be established to guide design, construction and supervision costs. Second, who should perform contract supervision is also very important. In Honduras, supervision of water and sanitation construction has been successfully achieved by PRASAR using in-house engineers. Similarly, UNEPAR in Guatemala has had a long-term record of efficiency in providing its own supervision. The biggest advantage to using in-house engineers is economic. The above example, i.e. WASH Report No. 187 contrasted with the pilot project cited, suggests that the ANDA/MU would save money by employing in-house supervision. Alternatively, the MU could continue to contract out supervision, however, only after establishing a

fair and logical fee schedule, and providing very strict monitoring.

Considering ways to improve efficiency in the project should be encouraged. Part of this consideration should include looking at lessons learned in other activities or projects such as PRASAR and UNEPAR mentioned above. For example, a USAID/ANDA delegation could visit PRASAR and/or UNEPAR to examine their work and experience, and to see if any lessons learned are applicable to managing rural water development in El Salvador. Other useful ideas could be gleaned from WASH Report No. 169 "Evaluacion del Proyectos de Agua y Saneamiento Rural en Honduras", (prepared by Luis Moncada, Rose Schneider, and Carlos Solares. March 1986. ACT. 210. Available in Spanish only).

Design work done by contractors seems to be satisfactory but the presence of an experienced sanitary engineer at the ANDA/MU is necessary in order provide the unit with the ability to discuss with winning contractors all technical aspects of a project from the preliminary study to the final design. Similarly, it would be advisable for the USAID/IRD office to obtain the services of a sanitary engineer. The benefit of this is that a sanitary engineer is directly acquainted with the discipline in both training and experience, and more readily would be aware of technical problem areas than someone from outside the discipline. If the USAID cannot hire a sanitary engineer directly, then it should consider hiring one on a retainer basis who could provide a week or so of service every few months.

Recommendation # 3: That the MU, in consultation with USAID, establish a fair and logical fee schedule that includes a sliding scale for design contracts, and for supervision contracts if the MU continues to contract out supervision, using the criterion of a higher percentage for smaller projects and a smaller percentage for larger projects.

Recommendation # 4: The MU should study the possible advantage of providing its own supervision from in-house; alternatively, if it continues to use contractors that the MU establish very strict monitoring and coordination procedures.

3. Relationship of Project to AID Development Strategy

The pilot project and its contemplated expansion address two areas of USAID/ES' program strategy, reconstruction/ restoration of services and the spreading of benefits. Many of the larger villages addressed under the Water Systems Component of the Pilot Project have been repair or restoration efforts caused by the civil strife, i.e. electrical disruption leading to damaged pumps and related system parts. Some upgradation efforts have been in response to increased demand caused by in-migration of displaced persons.

The spreading of health benefits and health services to small rural communities under 300 inhabitants has been an important element of the drilled wells/handpump component of the project. Since a majority of El Salvador's rural population lives in small communities under 300 people, the handpump component will continue to make a significant contribution to the spreading of benefits to rural communities. Indeed, this component of the pilot project represents the only effort in El Salvador attempting to address the provision of safe water to small rural communities.

The pilot project also addresses AID's policy paper on Domestic Water and Sanitation. The AID policy position is that it will consider funding projects for improvement in domestic water supply and sanitation where (1) a clear health need exists, (2) an absence of basic water and sanitation poses a public health hazard, (3) local or national institutions can assume responsibility for systems, and (4)

infrastructure and communication is developed enough to sustain the investment. More important, both USAID and ANDA's Management Unit are committed to community participation efforts and health education in the project, and if expanded to the FY89 and FY90 levels, these components would become fully active. AID's policy paper stresses that water and sanitation projects should adequately address three categories of issues: technical issues, social and cultural issues, and issues concerning the implementation and administration of program. The pilot project, because of staffing limitations, has been limited to--and has successfully addressed--the technical issues, especially as they relate to water quantity, convenience, reliability and selection of appropriate technology.

The selection of the exceptionally durable Mark II handpump for the pilot project was a very good decision. A drilled well with a handpump in problem areas or villages where piped water systems are not possible or feasible has to be viewed as a permanent solution to providing adequate quantities of safe water.

The Mark II pump was invented in India to provide dependable, trouble-free service under conditions of heavy use. Field tests run in India on 1,000 Mark II pumps during 1977-78 showed that it was a highly reliable pump and easy to operate and maintain. The study found the breakdown rate to be 10 percent compared to over 80 percent for traditional pumps. More information on the Mark II is available in Annex 2.

If fully expanded to FY89 and FY90 levels, the project would address all issues adequately, with increased emphasis being placed on the community participation and health education aspects which fall under AID' Social and Cultural Issues category. Similarly, in the expanded version of the project, adequate attention would be given to issues of implementation and administration, especially to the collection of user fees to finance operations and maintenance, and training of village residents to operate the systems. Finally, the expanded version, as has been the case in the pilot project, would continue to depend on the private

sector to carry out all system design and construction work.

4. Other Donor Assistance

Apart from USAID's assistance to the sector, other important donors supporting water and sanitation activities in El Salvador include: the Inter-American Development Bank (IDB), the Federal Republic of Germany, and the Government of Italy. The largest of these donors is the IDB. It is currently financing a $28 million rural water and sanitation project with PLANSABAR, of which $7 million is local counterpart funded by the Extraordinary Budget. This project seeks to improve the health and living conditions of El Salvador's rural population by providing potable water to 100 communities with a population ranging from 300 to 2,000 population, and providing latrines that will serve 75,000 people. The project agreement between PLANSABAR and the IDB was signed in September 1985.

The Federal Republic of Germany (West Germany) is also supporting water and sanitation efforts through two projects with ANDA. The first is an urban earthquake recovery project to provide the design work for potable water and sanitation through ANDA in the barrios of San Jacinto and Santa Anita of San Salvador for approximately $3 million. The second program, also implemented through ANDA, is providing the design work for potable water and latrine systems in rural areas and is investing about $9 million (DM 15 million).

Finally, the Government of Italy is providing design work for future water, sewer, and solid waste infrastructure projects in urban marginal areas through an investment of $20 million to ANDA as part of an earthquake recovery program. Like the West German supported program, the Italian program does not include project implementation. When the design work is done in one or two year's time, funding for implementation will have to be obtained either from the Italian government (or the West German government in its case) or another agency such as the IDB. Table 1 summarizes external donor assistance to the water and sanitation sector as of April 1988:

TABLE 1:

EXTERNAL ASSISTANCE FOR WATER AND SANITATION IN EL SALVADOR

Donor	Program	GOES Agency	Amount ($million)
IDB	Earthquake Recovery	ANDA	3.4
	(local currency)		0.5
	Total		3.9
IDB	Metropolitan Water/Sanitation	ANDA	166.0
	(local counterpart funds)		18.5
	Total		184.5
IDB	Rural Water and Sanitation	PLANSABAR	21.0
	(local counterpart funds)		7.0
	Total		28.0
W.Germany	Rural Water and Sanitation system design	ANDA	9.0
W.Germany	Water and Sanitation design San Salvador barrios	ANDA	3.0
Italy	Water, Sewer and solid Waste infrastructure design for marginal areas: Earthquake recovery.	ANDA	20.0
USAID	(1988 only) Water and Sanitation (Extraordinary Budget only)	ANDA	5.0
	Grand Total		$253.4 million

Future donor activities include a staff level proposed investment of $26 million more from USAID ($16 million from the Extraordinary Budget and $10 million from Development Assistance if available) over FY89 and FY90 to expand the activities started in the pilot project with ANDA. And still at the idea stage, is an additional investment from IDB for three new projects totaling $92 million: (a) a $50 million loan for water supply and sewage for secondary cities, (b) a $25 million loan for rural water systems, and (c) a $17 million loan for municipal development. At this point, only the third idea, the $17 million loan for municipal development is well enough along to be considered potentially viable as a project. This project will finance municipal development activities of which only some will be water and sanitation. The $25 million rural water supply project is still in the early "idea" stage, and if developed, would begin implementation no earlier than 1991. It would be funded at a subsidized interest rate. The water supply and sewage for secondary cities project idea, however, would be funded from ordinary capital with interest at the market rate which greatly reduces the probability of it becoming a project as the GOES is opposed to borrowing at the market rate.

Finally, UNICEF is planning a water and sanitation intervention with the regional office of the Ministry of Health in the Department of Cuscutlan. No figures are available yet on how much money UNICEF will be investing.

If fully expanded to proposed FY89 and FY90 levels, USAID's potable water project would provide water to an additional 120,000 rural inhabitants by the end of FY89 (800 wells X 150 persons/well) under the handpump component. This would represent about 4.1% of the estimated 1988 rural population of 2,892,142. The large IDB loan to PLANSABAR will provide water to another 230,000 people in 100 communities with safe water, or another 8.0% of the estimated 1988 rural population. In sum, combined donor effort would address about 14% of the rural population (based on the estimated 1988 population) if all proposed funds are invested by 1991. This would bring total rural coverage up to about 25%, or still some 8 percentage points below the modest 1989

CAI goal of 33.3%. Table 2 summarizes rural coverage including current levels and projected levels through 1991:

TABLE 2:

PROBABLE RURAL COVERAGE BY 1991

Donor/Agency	Type Program	% Covered	Year
PLANSABAR	Piped Systems	11.3	Current 1988
MU/USAID	Handpumps	2.2	Current 1988
PLANSABAR	Out of order systems repaired	1.4	FY88-FY89
MU/USAID	Handpumps	4.1	FY88-FY89
IDB	Piped Systems	8.0	FY86-FY91
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		27.0	

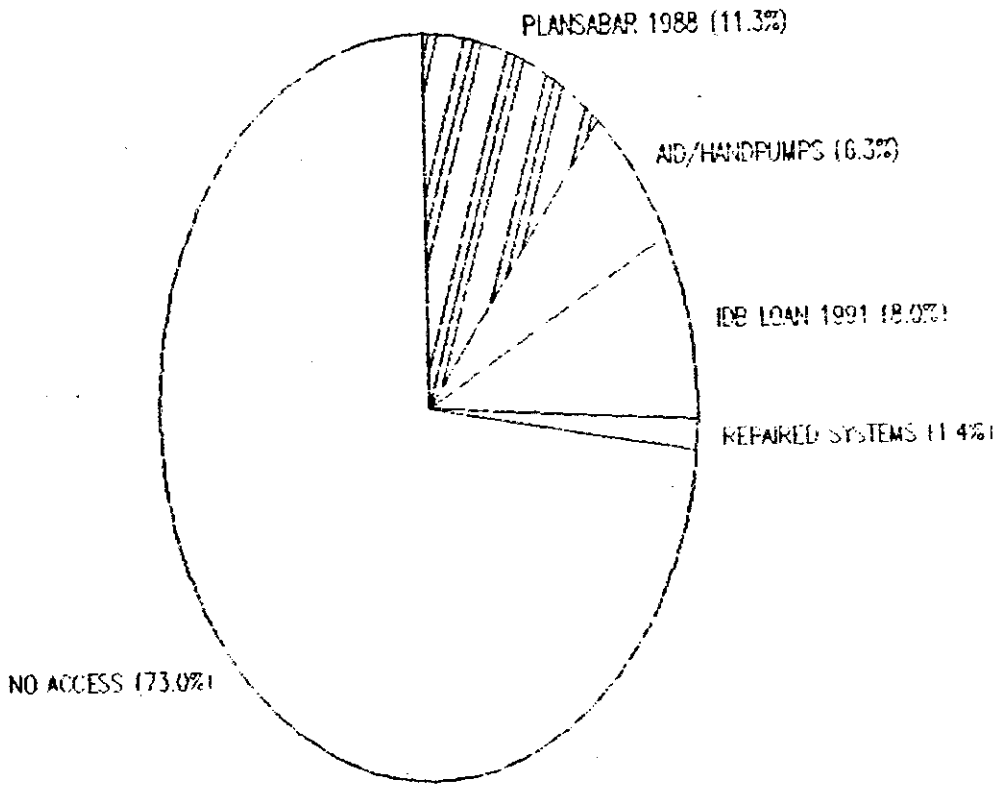
NOTE: Percent covered is based on estimated 1988 rural population of 2,892,142.

As illustrated in table 2, the handpumps project will, if extended through FY89, benefit 6.3% of the rural population. Moreover, the handpumps component is the only water intervention reaching down to small communities under 300, as all the piped systems are intended for communities that fit PLANSABAR's mandate for communities of 300 to 2,000 inhabitants. Even if all the investments in Table 2, are successful, over 70% of the rural population will still not have access to safe water after 1991. As well, the most optimistic scenario for the IDB's "idea stage" $25 million rural water supply project, which in any case wouldn't turn rock till 1991 or later, would at best add another eight percentage points to the probable 1991 level of 27%, bringing the coverage up to about 35%. Despite these considerable efforts, the unsatisfied demand for access to clean water well into the mid 1990's will still affect over 60% of the rural population (see Figures 3 and 4).

Figure 3

PROBABLE % RURAL ACCESS TO SAFE WATER

BY 1991 BY CURRENT DONOR OBLIGATIONS



II. Recommendations for Project Expansion

A. Procedures and Criteria for Community Selection

Until now, selection of communities to receive potable water services through the project has been handled in a more-or-less ad hoc manner. Understandably, emphasis during this start-up phase of project activities has been on establishing the necessary mechanisms to provide services and initiating implementation.

To begin to establish a list of possible beneficiary communities, CONARA and DIDECO, government organizations with ties to communities throughout the country, were contacted. Requests for handpumps and small water systems were received from both of these organizations.

CONARA receives requests for water services from urban and rural areas through the mayoral system. Elected mayors in each of the 262 municipios channel requests from towns and villages in their area to the central CONARA office in San Salvador.* The compiled list was passed to ANDA via the AID office. As mayors primarily focus on municipal areas, many of these requests fell outside the mandate of the pilot project. Some of the smaller villages, however, identified through this informal channel are potential recipients under the second component of the project, i.e. improved or repaired water systems.

Similarly, DIDECO receives requests though its network

* The country is divided into five regions: Western, Eastern, Central, Paracentral and Metropolitan. In general, divisions of each ministry can be found at the regional level. The regions are divided into departmentos. The fourteen departments are governed by governors appointed by the President of the country. The municipios are more or less equivalent to a US county and include the cabecera municipal where the mayor's office is located and the surrounding rural areas. These rural areas are sub-divided into cantones and then into caserios.

of promotores throughout the country. After compiling the list of communities requesting services, the central office in San Salvador passes them via AID to the General Director of ANDA.

A third means for identifying beneficiary communities has been through Save The Children. Through its work in integrated rural development in the impact area in southern La Union, seventy communities presently without access to potable water are receiving wells and handpumps. In this area Save The Children coordinates the community participation aspects; the ANDA Management Unit installs the handpump system.

While it is possible that requests be made directly to ANDA from communities, as ANDA has historically provided only urban water systems and is just now starting to provide services to smaller communities and rural areas, this request pathway is only now developing. The Management Unit is beginning to receive petitions for water services from areas located near communities that have been supplied services through the pilot project.

The multitude of community petitions (189 only from DIDECO) that are now pending--clearly indicates the great need for potable water in rural areas and underscores the necessity for a defined set of criteria to guide the community selection process. As it will be impossible to respond immediately to all the communities or even in the foreseeable future, priorities must be established.

To ensure that the neediest communities receive water services first and that the services provided are used, the WASH team recommends that definite criteria be established and applied. The request lists should not be translated automatically into a list of communities to receive water. A screening process must take place to identify those communities in real need. The following two general criteria are suggested for consideration by ANDA and AID:

- unavailability of water at reasonable access (members of a household do not have to spend a disproportionate

part of the day obtaining water for the family)

- health indicators

First priority should be given to those communities where no water is available at all, i.e. where it is currently necessary to travel long distances to obtain water or where access to water is difficult. Communities where water is within easy access even though the available water does not meet potable water standards should receive second priority. The rationale is that in communities where no water currently exists, the community will immediately begin to use the new services provided. In the second situation, unless access to the new water source is as easy as that of the unclean water already available (i.e. household connections to replace household wells), communities will most likely continue to use their existing water sources. Only until the community members acknowledge the link between clean water and health benefits will the new potable water services be utilized in a consistent manner. Therefore, only after health education efforts and a perceived need is felt by the community for cleaner water will the new services have the desired effect, whereby in communities where water is not available the effect will be immediate.

Morbidity and mortality rates and available data on incidence of water-related diseases should be a second criteria for community selection. This second criteria may be more difficult to apply due to the lack of readily available health statistics by locality. Past studies show, however, that the prevalence of diarrhea is three times higher in children of rural, nonliterate mothers.* A general rule to follow then would be the more rural and isolated the community the more priority that should be given . Also the Ministry of Health does receive and regularly tabulates data from clinics and health posts on the incidence of disease. A recently formed Ministry committee on childhood survival, Comite de Supervivencia Infantil, has identified diarrheal diseases as a key target in their recent action plan. To

* from the Ministry of Health's October 1987 Child Survival Action Plan.

access available information from within the Ministry of Health, the WASH team recommends that the Management Unit request from the Child Survival Committee a list of priority regions or areas where the incidence of water-related diseases is high. In the near future a second possible source for this information from within the Ministry will be the Primary Health Care Division, which is presently being formed by the Minister.

The team also suggests that the process for receiving requests though the various channels be streamlined. Positive aspects of the process used until now should be retained and improved. Ideally community requests compiled by DIDECO and CONARA would go directly to ANDA. Twice yearly the management unit could review these requests and prioritize communities according to the two criteria. The list of priority communities would then be presented to the General Manager and President of ANDA for input and approval. Once the decision is final, the MU would communicate to both DIDECO and CONARA the list of communities to receive services. This direct link would facilitate feedback to the requesting agencies on action to be taken by ANDA in responding to the requests.*

Selection through Save The Children has been very effective. The communities now receiving services meet the proposed criteria. This indicates that with additional information on specific communities requesting services

* This refers to a comment made by the DIDECO director that a community with a critical water problem had not received attention even though an urgent request had been submitted. Follow-up indicated that not only had the request been received, but the Management Unit had already contracted with a private firm to provide the services and work was to begin shortly. Direct communication between DIDECO and the MU could have avoided the frustration on the part of the DIDECO director and permitted DIDECO to pass on word to the community that their request was being responded to thereby improving ANDA's image with both DIDECO and the community.

through DIDECO and CONARA applied to the two criteria, selection could be improved. The list of requests as they now stand are incomplete to be able to make final community selection. More information is needed.

Initial visits would need to be made by MU personnel to collect data on current community water sources in order to determine priorities. This visit could be made by the ANDA promoter in collaboration with the hydrogeological person responsible for identification of water sources. The WASH team suggests information collected during this first visit be recorded on a form such as the "Community Fact Sheet" in Annex 3. Information on current water sources could be augmented with other information about the community, including existing hygiene habits and practices, the present level of community organization and names and locations of development workers in the area. As well as facilitating the selection of the neediest communities for potable water services, this information could be used to initiate health education and community organization around water issues and would serve as baseline data for evaluation of project activities.

This added step of information-gathering on communities during the selection process will obviously take more time. This extra effort, however, will result in a better selection of communities, thereby avoiding situations where services are provided though the project and then under-utilized. More emphasis on this first phase of community selection will enhance the eventual impact of project activities.

Recommendation # 5: That definite criteria be established and applied in community selection and that they follow two criteria: (1) unavailability of water at reasonable access, and (2) morbidity and mortality data on water-related diseases.

Recommendation # 6: That the Management Unit request from the Ministry of Health (either the Comite de Supervivencia Infantil or

the Division of Primary Health Care Services, which is presently being formed) a list of priority regions or areas where the incidence of water-related diseases is high.

Recommendation # 7: That requests for water services received by DIDECO and CONARA go directly to the ANDA Management Unit where twice yearly the requests would be reviewed and prioritized according to the established criteria. The list of priority communities would then be presented to the General Manager and President of ANDA for input and approval. The list of communities to receive services would then be passed on to both CONARA and DIDECO.

Recommendation # 8: That additional information on existing community water sources and hygiene practices be collected to assist in selecting the neediest communities. This information could be recorded on a community fact sheet (example in Annex 3) which would also include information on the present level of community organization, and names and locations of development workers. This data would be useful in initiating health education and community participation and could serve as baseline data for project evaluation, as well as facilitating the community selection process.

B. Strengthening of the ANDA Management Unit

To better carry out implementation of the project so that important attendant components can be addressed, the WASH team recommends the strengthening of the ANDA Management Unit. An adequately strengthened unit would consist of

regional offices located in the Central, Eastern, and Western regions of the country, each staffed with one Civil Engineer for monitoring of construction work and maintenance, one technician to provide pump maintenance and repairs and to impart training to communities, one driver/ mechanic, and promoters (one for every 30 project communities).* (The Paracentral Region would be handled out of the Central Office). In addition, the Management Unit would have one Sanitary Engineer, whose principal task would be to assure technical soundness of water and sanitation project designs and bids from private contractors. Main elements of this strengthening are discussed in the following sections which include relevant detailed recommendations.

The imminent move of PLANSABAR out of the MOH to ANDA makes available potential resources that could be used to fulfill the personnel requirements of the strengthened Management Unit. There is recent evidence from IDB that when given the resources it needs to carry out its work, PLANSABAR can perform admirably. These resources should not be lost. The additional personnel requirements discussed in the recommedations of this report could be met directly from carry-over personnel. Additional technical staff also makes it feasible to explore the possibility of in-house supervision of construction. Ideally, a recast PLANSABAR using the private sector approach for design and construction would be established within ANDA so that they can effectively meet their mandate for communities of 300 to 2,000 population, and eventually extend its mandate to communities under 300 as well.

Once the PLANSABAR group is effectively functioning, the Management Unit could be folded into the PLANSABAR division forming a rural water and environmental sanitation department to provide services to all rural communities. The

* This refers to thirty active communities, i.e. where project activities are being carried at any one given time. Including the pre-implementation and follow-up phases the period that the project is active in a community should at the most cover a period of one year.

Management Unit could continue to focus on wells and handpumps for very small communities. The formation of a strong rural water and environmental sanitation department would ensure that rural water needs remains a focus within ANDA.

C. Design and Implementation of Well/Handpump Systems for Rural Communities and Improved Systems for Larger Villages.

As mentioned before the pilot project is targeting certain areas where the GOES is not able to meet domestic water requirements. The handpump program is designed to meet the needs of these communities. A second component of the project is the design and construction of small and medium size water systems for larger villages.

In order to manage the referred projects, a Management Unit was created within ANDA. And in order to speed things up, the private sector has been used to achieve most of the work.

Up to now considering short-term productivity, the MU has done a remarkable job. However, in order to make the unit more effective and capable of handling the workload that would be brought about by the proposed expansion over FY89 and FY90 of an additional $26 million, the MU must be technically and administratively reinforced.

The ideal organization would be one that permits the MU to be self-sufficient in order to provide services to small rural areas. The critical need for potable water in both urban and rural areas throughout El Salvador summons all agencies involved to effectively coordinate their efforts so as to best use available resources. The use of the private sector should be continued. Private sector efforts combined with existing government resources can respond to the great need. Duplication of efforts should be avoided. Existing personnel resources should be considered before new staff are hired.

The transfer of PLANSABAR to ANDA, where the MU is located, will make additional resources available to ANDA

which should be used by the MU. Some important examples include the following:

-UNDP/PAHO is collaborating with ANDA and PLANSABAR through a long-term groundwater study of hydrological conditions in certain areas of the country. Once PLANSABAR is in ANDA, this coordinated effort will be facilitated and the Management Unit will have easier access to study results.

-PLANSABAR has twenty-six promoters with good experience in rural areas all over the country. The MU should hire some of them rather than contracting people who have no experience. Training of Promoters is a long term activity and some from PLANSABAR will be available after the transfer.

For the MU to fulfill its technical tasks the following professional personnel should be added:

One experienced Sanitary Engineer to supervise the design work done by contractors, from the preliminary design to the final plans, specifications, etc.

Three Civil Engineers, to act as monitors, one in each of three regions (Central, Eastern and Western). This would eliminate the supervision by contract and would permit the MU to solve some technical problems in the regions without having to wait for an engineer from the MU to visit.

Recommendation # 9: That the MU acquire the services of an experienced sanitary engineer, either through hiring one directly or having one seconded from ANDA's Design Department.

Recommendation # 10: That the MU hire three civil engineers to carry out supervisory work at the regional level.

The salary level of MU staff is an issue. The main

problem, as at most Salvadoran governmental agencies, is the loss of professionals as they get better offers from the private sector. The loss of trained workers is highly significant, and can have a deleterious effect on the professional caliber of an agency. To prevent this, the staff of the MU should be paid at least equal to other staff members of ANDA doing similar work.

The MU should also consider increasing the number of contractors currently pre-qualified. Apparently there are other firms and professionals interested in becoming a part of the list of selected firms. As more firms meet pre-qualifications standards, more selection options will be available to ANDA.

As there is not a Colegio de Ingenieros in El Salvador, perhaps the Camara Salvadorena de la Industria de la Construccion and the local section of the Interamerican Association of Sanitary and Environmental Engineering (AIDIS) could help by supplying a list of their members that could be invited to present resumes. A board of engineers of the MU should make the final selection in order to determine the ones most suitable. The Sanitary Engineer on the Team suggests that the contents of section 2.2.7 of WASH Field Report No. 187 be referred to for guidelines to establish parameters for contracting private firms.

D. Design and Establishment of Regional Water Analysis Laboratories

1. Water Quality Control

The main objective of a water project should be the improvement of health. As in many other places around the world, in El Salvador a high percentage of illness in the general population is water-related. Availability of a certain quantity of water is not enough. Importance should be given to quality control in order to assess the suitability of the water source. By law the Ministry of Health (MOH) has the responsibility to oversee water quality control, as established by Decreto No. 50 published in the official newspaper on October 16, 1987. The Ministry's

standards are outlined in "Apuntes sobre la Calidad de las Aguas de Uso Potable" prepared by the Department of Environmental Sanitation. Both ANDA and PLANSABAR have water quality control programs, so their laboratories should be used. The MU by itself should run bacteriological water quality tests on handpump installations with its field laboratory kits, at least once every two months. More complete chemical analyses should be made at areas where pesticides are used for agricultural purposes.

Recommendation # 11: That the ANDA/MU establish water testing routines using portable laboratory kits to conduct bacteriological analyses of the water once every two months.

2. Environmental Sanitation

Special attention should be given to excreta disposal by means of latrines. The ideal procedure would be the implementation of this activity simultaneously with water system construction. At most of the well sites visited there was not a correct means to dispose of runoff water and a pool had formed, attracting pigs and other domestic animals (see Figures 5 and 6). These runoff water pools also favor mosquito breeding. A well-built sump or a so-called french drain should be used in order to prevent this from happening. Promoters should put effort into health and hygiene education to enforce the proper use of water, including control of runoff.

Recommendation # 12: That construction of latrines in beneficiary communities be implemented simultaneously with installations of wells and handpumps, and that sumps be installed at well/handpump sites.

Figure 5

Figure 6

Figures 5 and 6 depict formation of runoff pools which attract domestic animals, and can promote mosquito breeding. Pump installations should include a well built sump or french drain to prevent this problem.

E. Design and Implementation of Community Mechanisms to Assure Community Participation

1. Operations and Maintenance of Systems

The handpumps installed to date have been used a relatively short time so maintenance problems have yet to surface. By the time maintenance problems do arise, the MU should have taken steps to assure that maintenance is carried out. Two members of the MU staff are presently at the Dempster pump factory in Nebraska, receiving training on maintenance of the Mark II pump. The intention is that when they return, training will be provided to a number of persons at operation and maintenance shops to be set up in each region.

One shop and warehouse should be established in each of the regions. A stock of spare parts must be kept on the premises as well as tools for repairs. For transportation, a pick-up truck should be provided. The truck should be equipped to carry spare parts and tools. One repair technician and a driver/mechanic should be assigned to each region.

Community participation in operations and maintenance has historically been successful in El Salvador, so adequate support should be given, e.g. at the village level the community should be responsible for administration, operation and maintenance through a local junta or comite. At least two people selected by the junta should be trained to give maintenance and make small repairs to the handpumps.

Again in this field the MU can use the previous experience of ANDA and PLANSABAR, as they have provided support to the communities through their regionally based technicians.

Recommendation # 13: That the MU follow through with plans to establish three regional operations and maintenance shops, staffed with one civil engineer to carry out monitoring and one technician to

provide maintenance training to communities, and to support communities when spare parts have to be purchased. The regional shop should have one pickup truck. One motorcycle should be provided to enable the technician to reach isolated communities not accessible by the pickup. A driver/mechanic should also be hired.

2. Community Participation

The Management Unit is keenly aware of the importance of involving community members in efforts to improve the potable water situation in their communities. The unit has focused on two strategies to encourage community participation in the handpump program: the organization of community water committees and the use of a signed agreement between ANDA and the community outlining the responsibilities of both groups in the construction, operation and maintenance of the pumps.

In the impact area of Save the Children in southern La Union a third strategy is being used. Communities actively contribute to the construction phase of the project. In several instances the communities have built access roads where difficult terrain and road conditions did not permit the private contractors to bring in the drilling equipment. As well as demonstrating the commitment of a community to the handpump project, participation at this early stage ensures that the project belongs to the community, that it is not a service being provided freely by the government. This approach sets the precedent for turning over the responsibility of operations and maintenance to the community once the construction phase is completed and the handpumps are functioning.

Save The Children also shares technical information with the community as to the availability of water in the area and the feasibility of finding water in any one specific site. This process of sharing technical information involves the community in design decisions and facilitates their

acceptance of decisions that need to be made for technical reasons.

Each of these strategies is a potentially effective organizing tool which the Management Unit should continue to use. In the rest of this section of the report these approaches will be discussed in more detail and suggestions will be made to improve and expand current attempts to foster community participation.

The contract used by the Management Unit that details the responsibilities of ANDA and the community in the construction, operations and maintenance of the handpump and sponsibilities of ANDA and the community in the construction, operations and maintenance of the handpump and well (see Annex 4) is signed at the time the handpump is installed and ready for use. A block is placed on the pump handle to prohibit its use until the agreement is signed. Once signed, the block is removed and the community is free to use the new services.

While the idea of requiring a formal agreement outlining responsibilities is a very good one, a community's signature on the contract using current procedures hardly denotes commitment to nor even an understanding of the terms of the contract. With the prospect of easy access to water, a very critical resource, just three signatures away, people could be expected to sign almost anything. Real and informed commitment on the part of the community that translates into on-going care and upkeep of the handpump and well, unfortunately, will take longer to obtain.

For the contract strategy to work, community members will need to understand exactly what will be required of them in terms of both time and money and to have a realistic plan of how they can fulfill their part of the bargain before their commitment to the agreement becomes meaningful. This informed commitment also needs to be obtained before ANDA's half of the agreement, the construction phase, is carried out. This will require advance work by the Management Unit in the community before final plans are made for implementation.

As well as serving as a check to guarantee community commitment and, therefore, a real felt need for the proposed services, this pre-implementation phase would allow for community-specific terms to be built into the agreement. For example, the responsibility of the community to build an access road for the equipment, plans for building latrines at the same time of the installation of the handpump, or an ANDA commitment to also construct a washing platform for women near the handpump site could be included. Making the contract more specific to each particular community situation and involving the community in that process would result in a more meaningful agreement, one much more likely to be adhered to.

Recommendation # 14: That prior to initiation of the construction phase the Management Unit work with each community to determine the specific terms of the agreement and that the contract is signed. The community will need to understand clearly what will be required of them and have a plan of how they will fulfill their responsibilities at the time of the signing of the agreement, if the agreement is to be meaningful.

Recommendation # 15: That community-specific terms be built into community contracts. These might include the responsibility of the community to build an access road for drilling equipment, plans for latrine construction at the same time as well-construction or an ANDA commitment to construct a washing platform for women near the handpump site.

More attention also needs to be paid to follow-up within the community after the installation of the pumps. The Management Unit will need to visit the community to assure that the handpump is functioning properly, that operation and maintenance procedures are being followed and that the user-

fee system is in place.

The necessary steps can be divided into three separate phases which can be used as guidelines by the Management Unit to assure community participation. The WASH team suggests:

Recommendation # 16: That three distinct phases of community organization be incorporated into the community participation strategy of the ANDA Management Unit as follows:

Pre-implementation Phase

time/effort required - at least three months and two-to-three visits, which would include at least one community assembly, to assure that entire community is represented

necessary activities/ outcomes
- water committee established
- contact established with development workers in the area
- responsibilities of both ANDA and the community outlined, including standard clauses and any community-specific terms
- community responsibilities are clearly understood, accepted and a feasible plan made for meeting them
- plans for workable user-fee scheme established
- agreement on handpump sites obtained
- contract signed
- decision to construct made

Construction Phase:

time/effort required - variable, enough necessary for community preparation, i.e. access road, etc. and well-construction/handpump installation, latrine-building, or training of community in maintenance

	and operations
necessary activities/ outcomes	- handpump constructed and functioning - community members trained in operations and maintenance - any other community-specific terms completed, e.g. latrines, platform for washing, etc. - water quality tested and results shared with community
Follow-up Phase:	
time/effort required	- six month period with at least two or three visits to the community
necessary activities/ outcomes	- assurance that upkeep of handpump is adequate - assurance that hygiene around pump is adequate - water quality tested and results shared with community - assurance that user-fee scheme is functioning, proper records being kept and community review in process

Following this three-phase process would result in more effective project implementation. The process also respects three tenets of successful community organization:

* involves community in all steps of program, from beginning to the end

* builds skills within community to identify and resolve problems

* recognizes and allows for existence of different opinions and factions within communities

The WASH Team envisions a two-tier approach to achieve community participation and health education goals in the project. Initially, the Management Unit with additional promoter staff would interact directly with communities to achieve desired results as discussed in this section. Sustainability over the longer term can be achieved only if some coordination is obtained between principal government

agencies at the departmental level, or if not at least at the regional level. Therefore, as a second priority, ANDA/MU would work to establish coordination between government agencies such as Education, Public Health and Agriculture.

The recommendations made here represent a significant increase in the workload of the Management Unit, one that would be impossible to fulfill with existing manpower. These steps are essential though, if the project objective to provide a healthy, clean, productive source of drinking water that is used, operated and maintained in rural communities in El Salvador is to be met. More staff will need to be hired to carry out these extra steps to ensure adequate community participation. Recommendations for the number, type, specific job functions and necessary training of these new personnel will be made in a later sections of the report following more in-depth discussion of the strategy for integrating health education activities into the project and of the user-fee issue.

F. Initiation of Health Education at the Community Level

Original plans for the pilot project included an emphasis on health education efforts to improve portering, storing, handling and household use of water such as cooking, cleaning and personal hygiene. Health educators working out of regional or departmental waterworks repair facilities were to be hired to conduct health education activities in the target communities. As these personnel were never hired, this component of the pilot project has not been realized.

Indeed if significant health benefits are to be achieved, a focus on health education to improve the use and handling of water and hygiene habits as well as just the provision of safe drinking water will be necessary. Development experience throughout the world points to this fact. That experience also shows that to be successful health education must be incorporated in continuous education program efforts; evidence from project evaluations suggests that sporadic information and education campaigns do not result in actual behavioral changes (AID Policy Paper on Domestic Water and Sanitation. May 1982).

One-time health education activities, i.e. a health education talk or charla at the time that the pump is turned over to the community, then, will not have much effect, perhaps not even enough to warrant the time and energy to do it. To have an impact education efforts will need to be on-going and frequent. Given that the potable water project can be expected to serve upwards of 600 communities over the life of the project, it is unrealistic to assume that health educators (promoters) hired by ANDA can directly provide the community health education necessary for real behavior change. Similarly, it is unrealistic to expect that ANDA, an organization of engineers, will integrate health education efforts into their mandate indefinitely. In order to establish on-going health education efforts, the WASH team recommends:

Recommendation # 17: That project health education activities on water use and hygiene be provided by community based development workers currently working within rural communities. These include Ayudantes Rurales de Salud, Ayudantes Communutarios de Salud and nurses of the Ministry of Health, and Educadoras del Hogar of the Ministry of Agriculture.

In all but one of the communities visited by the health team a health facility or health worker was located in the nearby vicinity of the new handpump. These health workers have had past training in sanitation and hygiene, and the role of health educator in sanitation is a logical extension of their regular job function. Moreover, it is desirable that the person providing health education can also advise the community persons how to treat simple water-related diseases and, as necessary, refer cases for more sophisticated treatment. The rural health worker is a logical and obvious choice for this role.

Similarly the task of instructing women in better hygiene habits in the home is a logical role for the

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Similarly the task of instructing women in better hygiene habits in the home is a logical role for the

Educadoras del Hogar. The WASH team did not have a chance to meet with persons involved with this program in the Ministry of Agriculture, but the possibility of effective collaboration seems likely and should be explored.

Traditionally health educators have focused on teaching health information and facts and trying to convince people to assume better health habits. This approach has had only limited success because a desire to be healthy is only one of the many factors , that influence behavior. For example, where a woman goes to obtain water for her family depends on many factors including the time it takes to fetch the water; how difficult it is to get there, e.g. rough terrain, a steep incline; the fact that one of the water sources is on the way back from where she has to run another errand; or just that she likes to talk to her friends who get water from a certain spot. Time, ease, cost, social factors, traditional beliefs and established patterns all influence behavior along with the desire to avoid sickness and be healthy. An effective health education approach must take all these factors into account.

The WASH team recommends:

Recommendation # 18: That a problem-solving approach to health education be adopted rather than the traditional information-giving approach. The health education methods should involve community members in identifying and resolving water-related problems in their communities.

A participatory, problem-solving approach to education, rather than telling people what they should do, enlists them in identifying the problem and then finding realistic solutions to resolve the problem. A brief example of the technique is the following. Using participatory group techniques, a health educator would present the problem of infant diarrhea using, if possible, data and actual examples from the community. The group would then identify possible reasons for the sickness and together find solutions to

prevent it. The role of the health educator would be to facilitate the discussion and provide health information when appropriate. During the process of discussing the problem and identifying possible solutions, the community members themselves provide the necessary information on the other factors that influence their behavior and then actively integrate this information into the solution they decide upon. For example, if women think that going to a certain source for water is inconvenient then they won't propose that as a solution to the problem. They will work to find a solution that is convenient. The solution that they arrive at will most likely be carried out.

People are more likely to adopt new behaviors when they themselves have decided what needs to be done. The problem-solving approach also allows for the new behavior to be incorporated into the actual reality of the community. People learn not only what to do, but how to do it within the context of their own daily lives.

Experience also shows that ingrained habits such as personal hygiene, where a person defecates and other very personal matters are difficult to change. If someone has been doing something in a certain way for 50 years, changing that practice will not be easy. Children then are perhaps a more realistic target group when trying to influence certain behaviors. The WASH team suggests:

Recommendation # 19: That primary schools located in the target communities be a second focus for project health education efforts. Simple and fun health education activities should be developed and introduced to the area primary school teachers. The teachers will need to be trained in the use of these new materials and in ways to incorporate health education into the regular school schedule.

Essential to this recommendation is that water and sanitation facilities in the primary schools be adequate so

that children may begin to practice the hygiene behavior they are taught. In each of the target communities where adequate facilities do not exist at the school they should be provided though project funds.

Recommendation # 20: That the project provides potable water, latrines and hand-washing facilities to primary schools in target communities where adequate facilities do not currently exist.

Finally, the important role that women play in the handling and use of water in the home must be considered. The health education strategy should incorporate specific ways to involve community women in the health education program. One approach would be to enlist one or two community women to actually assist in health education activities with other women. These women could be trained along with rural development workers in hygiene and sanitation matters and in health education techniques. The first step would be to include women on the community water committee. The WASH team recommends;

Recommendation # 21: That the Management Unit encourage communities to include at least one woman on the community water committee and that she be trained along with other development workers to carry out health education activities in the community.

G. Establishment of a User-Fee Recovery System

A user-fee recovery scheme is key to the potable water project handpump strategy. Once communities are supplied with water, they are to assume responsibility for simple maintenance and repair of the system. The community will need to establish a mechanism for collecting fees from users to cover costs of running the system.

Part of the community's responsibility as outlined in

ANDA's contract with the community is that the community will establish a fee system in which all families pay a minimum of 5 colones monthly for use of the handpump. This fund is to be used to pay a community person to maintain the system, purchase supplies and parts necessary for maintaining and repairing the pump and replacing the pump when it becomes necessary. All communities that have received pumps have signed this agreement at the time that the handpump system was put into operation.

In actual fact though it seems that few if any of the communities have established a fee system. None of the communities where handpumps had been installed that were visited by the WASH team were collecting fees. And when queried by the team whether or not one had to pay something to use the handpump, persons getting water from the pumps in each of the communities replied that the water was free.

The head of the water committee in El Caraon in La Union expressed that collecting fees in his community would be very difficult. The families in the area are very poor and do not have cash. The committee could not deny water to those families that could not pay. He also mentioned that money was especially scarce at the current time, the end of the dry season. Most families could not be expected to have any money till harvest time.

That results to date in the area of user fees have not been positive is not surprising. Establishment of a functioning fee system in areas where financial resources are limited, availability of money is cyclical at best and water is not thought of traditionally as something that one pays for will take time and effort. The Management Unit will need to assess the success of their efforts till now and experiment with new ways to help communities establish a fund for repairs.

Given that willingness and ability to pay for new water services will vary from community to community, the best approach will be one that allows each community to set up a system particular to their own circumstances and needs. This will not happen automatically. The Management Unit will need

to assist communities estimate the amount of money needed per year to operate and maintain the system and an appropriate amount to have on hand for parts replacement and then consider various payment schemes to collect that amount. The community can then arrive at an estimated average cost per family and consider various ways in which these costs can be met.

Different payment schemes may be appropriate for different areas. The monthly user payment scheme may be appropriate for communities where use of the water source by a stable group of families. However, in more dispersed localities families might be varying their water source and not using the same well on a continuing bases. In such cases, another fee scheme may be appropriate that charges by use or amount of water. Also in areas where the only time that villagers have money is at harvest time, communities might consider a one-time yearly payment fee. Or in the case where certain families will never have adequate cash to contribute for upkeep, the community might work out a plan where certain families work to maintain the system in lieu of money.

The Unit should also help communities set up simple accounting procedures to manage the funds and a system that provides for financial review by community members. Community members can be expected to pay only if they are able to see how the funds are being used and if they are assured that the monies are being managed properly.

One thing that is clear is that the commitment of the community to support the operations and maintenance of the system and the mechanism for payment need to be agreed upon before the handpump system is installed. Once the handpump is in place, a community will be likely to agree in principle to most anything in order to start using the system.

A recent WASH study into the willingness to pay issue highlights the importance of community input into the type of services to be offered. The WASH research shows that community members are willing to pay for new services only to the extent that they value the new services and consider the

new water source a significant improvement over previously existing sources of water which were free. Conversely, if the level of service provided is highly-sophisticated, the community, even though they value the new service, may be unable to pay the amount necessary to operate and maintain the system. In either case the result is the same: the system falls into disrepair for lack of adequate operating and maintenance funds. The lesson is that if communities are to effectively operate and maintain a system:

(1) they will need to participate in the design stages to ensure that they consider the new service an improvement over the old, and
(2) the user fee system will need to be established prior to construction to ensure that the community will be able to meet the cost of maintenance and operations.

Recommendation # 22: That prior to beginning installation of the handpump system, the Management Unit assist communities establish a user fee system particular to their own circumstances and needs. The Unit should help the community estimate the amount of money needed per year to operate and maintain the system and an appropriate amount to have on hand for parts replacement, and then decide on a payment scheme to collect and maintain that amount. The payment scheme should be agreed upon by the community before construction of wells begin.

Recommendation # 23: That the Management Unit assist communities set up simple accounting procedures to manage the funds that provides for financial review by community members.

H. Institutional Needs for Health Education/Community Participation Component.

In previous sections of this report, recommendations were made to involve development workers from other El Salvadoran institutions in health education and community organization efforts at the local level. For this collaboration to become a reality, these workers will need to receive adequate support, supervision and follow-up on an ongoing basis. The ANDA Management Unit can partially provide the support and feedback necessary. During visits to the community, MU staff can visit the community workers to find out about their activities, make suggestions to improve and expand their work and encourage the worker to continue. However, support for the worker's role in water-related health education activities will also need to be forthcoming from the worker's sponsoring institution.

At a minimum, the expected tasks must be accepted and supported by the institution of the proposed worker. If the community worker is to carry out a significant amount of additional activities for the ANDA water project, his/her immediate supervisor must approvew. Optimally, the supervisor would also provide technicalk support and resources for the new role. Institutional links will have to be established.

To that end, the WASH team makes the following recommendations:

Recommendation # 24: That the management unit provide direct support and feedback to the community worker participating in project efforts at the local level. In practice this would mean that on each trip to the community the MU person would visit the development worker to provide feedback, encouragement, and advice.

Recommendation # 25: That direct links be established between area development workers and the community water committee. This might take the form of an expanded water committee at the local level to include both community members and development workers.

Recommendation # 26: That the Management Unit establish a coordinating committee at the departmental or regional level of representatives of the institutions of the community-level wodrker.

Insitutional support for the community-level workers is essential and must be obtained in the beginning. As the project continues, it might also be necessary to consider means to provide material resources and financial support for the workers.

Also, once the Department of Primary Health Care is established within the Ministry of Health, it may also be advisable to establish a national coordinating committee with the new department and representatives from the other collaborating ministries.

I. Proposed ANDA Promoter

Given the current limited staffing of the Management Unit and the additional tasks necessary to integrate health education activities and to assure an adequate level of community participation for project success. Clearly, staff will need to be added to the Unit. The team suggests that promoters be hired to lead the health education and community organization efforts.

Reponsibilities of this new cadre would include the following:

- establishing a functional water committee that represents the entire community and includes at least one woman.

- assisting the community establish an appropriate user fee system and mechanisms for fee collection, accounting procedures and financial review.

- facilitating appropriate site selection within the community for handpumps.

- helping to resolve conflicts among community members over water issues.

- facilitating community participation in building the system.

- identifying development workers in the community who can assist in health education efforts and supporting and providing feedback to those workers.

- assuring that the local health worker has adequate supplies to treat simple water-related diseases (especially ORT packets) and that water-related diseases are identified and treated, or referred to appropriate health facility.

- establishing and liaising with area the health education committee to assure that health education activities are being conducted at the community level, that proper support and feedback is being provided and that adequate resources are available for project activities.

The main focus of the promoter would be the community. However, his job should also include facilitating coordination at either the departmental or regional level among the institutions of those community-level workers collaborating in project activities. In addition, he would be the primary liaison person between the community and the technical aspects of the project.

The promoter role is very important for the project. The promoter will be essential in assuring that the three phases of the project within each community (pre-implementation, construction and follow-up) are effectively executed. And

the degree of success of the promoter will ultimately determine the impact of project efforts in providing potable water to communities in the long-term and improving sanitation and health conditions.

The number of promoters necessary will be a function of the number of communities to receive water services through the project. To adequately carry out the work, each promoter should be assigned no more than thirty communities (community assignments will need to be grouped by area). It is suggested that these promotores be based in the regional waterwork facilities.

Recommendation # 27: That the Management Unit hire promoters to lead and coordinate health education and community participation around water and sanitation issues. One promoter should be hired for each thirty project communities receiving potable water services though the project.

Twenty-eight community water promoters based throughout the country work with PLANSABAR. The majority of the PLANSABAR promoters have over twenty years of experience in water programs and are considered to be very good at their work. Teamed with younger promoters who would be likely to be more open to new ideas and innovations introduced in the ANDA project, they could be a valuable resource to the AID Rural Potable Water Project. If it so happens that in the transfer of PLANSABAR to ANDA some of these promoters are left without work, the Management Unit should consider hiring them for the promoter role discussed here.

Recommendation # 28: That the Management Unit consider hiring PLANSABAR promoters and teaming them with younger, less-experienced promoters who would most likely be more open to new, innovative ideas. This combination of the new and the old would result in a very effective team.

J. Training

1. For Operation and Maintenance of the System

Training should be provided, both at the professional and the technician level. At the professional level short courses on sanitary and environmental sanitation subjects should be imparted to the staff. At the technician level the most important training should be that of the handpump caretakers at the communities. This could be done either in place or at a regional level for a groups of community representatives at the regional shops. It is important that caretakers, selected either for handpumps or water systems, have worked on the final stages of construction and, thereby, are familiar with the system.

2. For Community Participation and Health Education

Training will be required to prepare ANDA promoters and community-level persons for their role in health education and community participation. Proposed job descriptions of each of the workers found in Annex can be used to determine the course content.

Efforts at the community level can be enhanced through coordination among community workers and community members. Training can be an effective tool to bring about this collaboration. People who are trained together are likely to work together following training. And a team of persons at the community-level working together for a common purpose will be more effective in promoting needed change than isolated efforts of several persons. It is therefore suggested that training be organized to include the health worker, the primary school teacher and any other community-level worker plus a member of the water committee, all from the same community.

A series of short day-courses for this "community team" is likely to be more effective than one long seminar and would be logistically simpler as no over-night accommodation

would be required. For example, five or six communities in the same area could be grouped together. A team from each would come together at a central location for one day every two or three weeks to learn about water-related health issues, health education techniques and simple prevention and treatment measures. Each team would develop plans for carrying out health education in their community. At the subsequent meeting, the teams would share what they have done and receive feedback from the others. Follow-up and support is built into this approach. The sharing of ideas as well as improving the health education efforts would be effective in encouraging each of the community teams to continue.

Training for the ANDA promoters will need to be more intensive. To effectively carry out their work the promoters will need a range of skills in working with groups including conflict-resolution and negotiation skills as well as more traditional skills in health and sanitation matters. Their training should emphasize skill-building and ways to put into practice within the community recommendations flowing from knowledge about causes and prevention of water-related disease.

In both the community-level training and the training of the ANDA promoters, participatory training methods should be used. These methods in contrast with the more didactic lecture method allow trainees a chance to adapt ideas to their own situations, share their own ideas and practice skills. This is especially critical as people tend to teach as they themselves have been taught. If the training is a series of lectures, then the trainees will most likely proceed to lecture the community resulting in little chance for actual change in present practices.

These suggestions are presented for consideration only and no specific recommendations will be made by the WASH Team at this time as to how the training should be organized. Actual plans for training will need to be carefully worked out when more information regarding logistics and resources is available.

Serious consideration needs to be given to who is to organize and conduct this training. The training called for here will require experienced trainers skilled in using participatory training methods, well-versed in the problem-solving approach to health education and knowledgeable of the community context in El Salvador. The training also represents an important opportunity to involve and thereby obtain the support of mid-level supervisors from the institutions of the community workers collaborating in the project. The team suggests that Save The Children be contracted to conduct the training. Save is currently using these techniques in their work in El Salvador and meet the requirements cited above. The team also suggests that provincial or regional level personnel of the Ministry of Health be included on the training team for the community workshops. USAID might also consider obtaining additional technical assistance from outside El Salvador to assist in developing an appropriate health education methodology.

Recommendation # 29: That Save the Children be contracted to conduct both the community-level training and the training for ANDA promoters and that mid-level Ministry of Health personnel be involved in the training of community workers.

III. Funding and Budget Considerations

A. Financing of the Health Education and Community Participation Components

Recommendations in this report call for significantly increased emphasis on community participation and health education. This focus is essential if the project is to have long-term impact. The project budget must reflect this focus and sufficient funds will need to be directed to the training and support of workers participating in these activities.

B. Methods of funding

The pilot project has been funded primarily out of local currency from the Extraordinary Budget, with some F/X costs

covered by USAID/El Salvador's Public Services Restoration project (519-0279). The purpose of Project 519-0279 is to assist the GOES to replace vital infrastructure, e.g. to repair water systems and road networks, and to restore the electrical grid damaged by guerrilla activity. The pilot project was housed in 519-0279 because some beneficiary communities do meet the definition of the purpose of project, and also because it had funds to allow a pilot project idea to get started. As originally conceived, the pilot project was to be phase II of a three phased Special Impact Domestic Water Project; Phase I was the conceptualizaton and mobilization phase wherein arrangements to carry out such a project would be made as discussed above, e.g. set up a management unit in ANDA, etc., Phase II the pilot project discussed above, and finally Phase III a five-year expanded version of the pilot project with separate Mission funding. Phase III was to start during FY88 and was to be assigned the USAID project number 519-0234. However, a USAID management decision was made during FY87 to limit new project starts as a means to better manage the heavy USAID workload of projects already underway. The effect of this decision is that in order for the Special Impact Domestic Water Project to move into its third phase, it would have to either be folded into Projedct 519-0279, or funded through some other mechanism such as a PVO.

Because some systems in the proposed expanded water project might not meet a strict definition of the purpose of Project 519-0279, i.e. repair and restoration of public services damaged directly or indirectly by the conflict, such as the installation of handpumps which are usually new services, another funding mechanism should be found for this important project. The overwhelming need as expressed by the low percentage of the rural population with access to safe water and the high incidence of water-related diseases would seem to warrant reconsideration of the Mission position on new project starts. If the USAID is unable to fund the proposed expansion of the project under 519-0279, nor able to reconsider a new project for rural water and sanitation, then the WASH team would recommend that the project be funded through a PVO, such as Save the Children.

The idea of using a PVO for the project is not new, and was first discussed in WASH Report No. 187, "Preliminary Design for Handpump Installation in El Salvador." Presently, Save the Children is implementing its Community Based Rural Development Program in La Union, funded by USAID. Seventy handpumps are being installed in the program in coordination with the Pilot Project. If there is scope to increase this project to a national level, it should be done. Alternatively, another PVO with a program modeled along the lines of Save the Children's should be pursued. Information the WASH team was able to glean from discussions with various USAID staff persons is that a possible source of funding would be unprogrammed health funds. Some of these funds could be used, if available, in supporting the proposed expansion of the pilot project.

There would be two options available if a PVO is involved in an expansion project. The first one would link a PVO with the ANDA/MU. In this option, the PVO would essentially provide training to ANDA/MU field staff on matters of community participation, and coordination of health education training with other government agencies active in the target communities. The PVO would also facilitate identifying potential beneficiary communities based on need. That is, they would be pro-active in implementing selection criteria for beneficiary communities. The PVO would also have the responsibility of purchasing handpumps and spare parts. The ANDA/MU's role in this option would be to provide the technical input. Similar to the MU's present role, its activities would include technical site surveys, and responsibility for all aspects of design, supervision and construction/installation of handpumps. The ANDA/MU would also shoulder much of the responsibility for following through on community participation, health education, and pump maintenance matters. A possible variation would be to give responsibility for the health education and sanitation components of the project to health personnel. The PVO would extend training and/or coordination to the MU staff and involved health personnel, but would not perform the tasks directly, other than initiating site selection criteria. Funding arrangements in this first option would include an OPG to the PVO to carry out its

software functions. The Extraordinary Budget would continue to be used to finance the MU's technical functions. Essentially, all of the recommendations mentioned above would be applicable in this option.

The second option would entail a PVO, such as Save the Children, carrying out all of the work including the community participation, health education, maintenance, and technical work. Indeed, this would be a more complicated approach, but would have the attendant benefit of bringing a PVO's good community-level work to bear on the project. In this option, it would be necessary for the PVO to acquire a technical staff similar to that proposed in the foregoing recommendations, in addition to a technical staff at least equal to that now existing at the Management Unit. If a PVO like Save the Children were used which employs a promoter-rich staff to carry out community work, the number of personnel would become very large. At the present time, Save the Children is employing 40 promoters for its three small project impact areas. Extended to a national level, the number of staff would soon become a thundering horde. It is doubtful any PVO would want to assume this level of effort.

From the institution-building perspective, a PVO at a national level would be an inefficient investment. While a PVO, such as Save the Children, is often successful at the community or regional level, it usually achieves its success with its own people, by-passing skills building opportunities for local government persons. When the PVO retreats from its project area, the investments made are often not sustained.

One powerful advantage to using a PVO is the fact that PVO's are traditionally frugal, and would likely exert close, and strict monitoring over the design, supervision, and construction work that would be carried out by contractors.

In this option, all foregoing recommendations would have to be revamped and made applicable to a PVO.

Funding arrangements for this option would have to be made through an OPG.

On balance, the preferred option would be the first one with ANDA responsible for technical matters and health personnel assuming responsibility for health education. If Save the Children were to express interest in extending its activities in-country, this would represent an ideal mix of resources between the ANDA/MU's technical capacity, Ministry of Health staffing resources in the field and Save the Children's community level work. Save the Children could impart important training to ANDA/MU field promoters and MOH health workers as outlined in the recommendations of this report, and thereby bring their expertise to bear on important sustainability issues in the project.

LIST OF RECOMMENDATIONS

Recommendation # 1: When the transfer of PLANSABAR to ANDA is completed, that ANDA should immediately undertake a technical survey to put back into commission the 35 systems not working.

Recommendation # 2: That improved systems under the pilot project, and any expansion of it over FY89 and FY90 be officially moved to ANDA or PLANSABAR for maintenance and operations upon completion.

Recommendation # 3: That the MU, in consultation with USAID, establish a fair and logical fee schedule that includes a sliding scale for design contracts; and for supervision contracts, if the MU continues to contract out supervision, using the criterion of a higher percentage for smaller projects and a smaller percentage for larger projects.

Recommendation # 4: The MU should study the possible advantage of providing its own supervision from in-house; alternatively, if it continues to use contractors that the MU establish very strict monitoring and coordination procedures.

Recommendation # 5: That definite criteria be established and applied in community selection and that they follow two criteria: (1) unavailability of water at reasonable access, and (2) morbidity and mortality data on water-related diseases.

Recommendation # 6: That the Management Unit request from the Ministry of Health (either the Comite de Supervivencia Infantil or the Division of

Primary Health Care Services, which is presently being formed) a list of priority regions or areas where the incidence of water-related diseases is high.

Recommendation # 7: That requests for water services received by DIDECO and CONARA go directly to the ANDA Management Unit where twice yearly the requests would be reviewed and prioritized according to the established criteria. The list of priority communities would then be presented to the General Manager and President of ANDA for input and approval. The list of communities to receive services would then be passed on to both CONARA and DIDECO.

Recommendation # 8: That additional information on existing community water sources and hygiene practices be collected to assist in selecting the neediest communities. This information could be recorded on a community fact sheet which would also include information on the present level of community organization, and names and locations of development workers. This data would be useful in initiating health education and community participation and could serve as baseline data for project evaluation as well as facilitating the community selection process.

Recommendation # 9: That the MU acquire the services of an experienced sanitary engineer, either through hiring one directly or having one seconded from ANDA's Design Department.

Recommendation # 10: That the MU hire three civil engineers to carry out supervisory work at the regional level.

Recommendation # 11: That the ANDA/MU establish water testing

routines using portable laboratory kits to conduct bacteriological analyses of the water once every two months.

Recommendation # 12: That construction of latrines in beneficiary communities be implemented simultaneously with installations of wells with handpumps, and that sumps be installed at well/handpump sites.

Recommendation # 13: That the MU follow through with plans to establish three regional operations and maintenance shops, staffed with one civil engineer to carry out supervision and one technician to provide maintenance training to communities, and to support communities when spare parts have to be purchased. The regional shop should have one pickup truck. One motorcycle should be provided to enable the technician to reach isolated communities not accessible by the pickup. A driver/mechanic should also be hired.

Recommendation # 14: That prior to initiation of the construction phase the Management Unit work with each community to determine the specific terms of the agreement and that the contract is signed. The community will need to understand clearly what will be required of them and have a plan of how they will fulfill their responsibilities at the time of the signing of the agreement, if the agreement is to be meaningful.

Recommendation # 15: That community-specific terms be built into community contracts. These might include the responsibility of the community to build an access road for drilling equipment, plans for latrine construction at the same time as well-construction or an ANDA commitment to construct a washing

platform for women near the handpump site.

Recommendation # 16: That three distinct phases of community organization be incorporated into the community participation strategy of the ANDA Management Unit as follows:

Pre-implementation Phase,
Construction Phase,
Follow-up Phase.

Recommendation # 17: That project health education activities on water use and hygiene be provided by community-based development workers currently working within rural communities. These include Ayudantes Rurales de Salud, Ayudantes Communutarios de Salud and nurses of the Ministry of Health and Educadoras del Hogar of the Ministry of Agriculture.

Recommendation # 18: That a problem-solving approach to health education be adopted rather than the traditional information-giving approach. The health education methods should involve community members in identifying and resolving water-related problems in their communities.

Recommendation # 19: That primary schools located in the target communities be a second focus for project health education efforts. Simple and fun health education activities should be developed and introduced to the area primary school teachers. The teachers will need to be trained in the use of these new materials and in ways to incorporate health education into the regular school schedule.

Recommendation # 20: That the project provides potable water, latrines and hand-washing facilities to

primary schools in target communities where adequate facilities do not currently exist.

Recommendation # 21: That the Management Unit encourage communities to include at least one woman on the community water committee and that she be trained along with other development workers to carry out health education activities in the community.

Recommendation # 22: That prior to beginning installation of the handpump system, the Management Unit assist communities establish a user fee system particular to their own circumstances and needs. The Unit should help the community estimate the amount of money needed per year to operate and maintain the system and an appropriate amount to have on hand for parts replacement, and then decide on a payment scheme to collect and maintain that amount. The payment scheme should be agreed upon by the commuity before construction of wells begin.

Recommendation # 23: That the Management Unit assist communities set up simple accounting procedures to manage the funds that provides for financial review by community members.

Recommendation # 24: That the management unit provide direct support and feedback to the community worker participating in project efforts at the local level. In practice this would mean that on each trip to the community the MU person would visit the development worker to provide feedback, encouragement and advice.

Recommendation # 25: That direct links be established between area development workers and the community

water committee. This might take the form of an expanded water committee at the local level to include both community members and development workers.

Recommendation # 26: That the Management Unit establish a coordinating committee at the departmental or regional level of representatives of the institutions of the community-level worker.

Recommendation # 27: That the Management Unit hire promoters to lead and coordinate health education and community participation around water and sanitation issues. One promotor should be hired for each thirty communities receiving potable water services though the project.

Recommendation # 28: That the Management Unit consider hiring PLANSABAR promoters and teaming them with younger, less-experienced promoters who would most likely be more open to new, innovative ideas. This combination of the new and the old would result in a very effective team.

Recommendation # 29: That Save the Children be contracted to conduct both the community-level training and the training for ANDA promoters and that mid-level Ministry of Health personnel be involved in the training of community workers.

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CONDUCTED IN 1987

ANNEX 1

ANALYSIS OF INFRASTRUCTURE NEEDS PRIORITIZATION WITH REGARD TO MUNICIPALITY TYPE AND POPULATION

The results of the questionnaire "Identification of Infrastructure Needs Prioritization" were analyzed according to the needs and characteristics of each municipality. A combination of three mayor features which exemplify the municipalities' development level or resource availability for the self fulfillment of their prioritary needs.

a. Quantity and quality of basic public services, such as health, education, telecommunications, electric power, potable water, etc.

b. Access roads, urban streets, commercial and industrial development

c. Urban population, not including marginal settlements and displaced population

There are four types of municipalities on which this analysis was based:

1. Small municipalities

   Municipalities with an urban population ranging from 1000 to 5000 inhabitants, underdeveloped health and education services, and commercial activity mainly based on farming and artisanship.

2. Medium sized Municipalities

Municipalities with populations of approximately 10,000 inhabitants basic services of health, electric power, education, adequate access roads, fairly developed commerce and small industry.

3. Larger Municipalities

Municipalities with populations of more than 10,000 inhabitants, a well-developed service infrastructure, good access roads, and active commercial and industrial organizations. (Departmental capitals and municipalities within Salvador metropolitan area are not included).

4. Major Municipalities

All departmental capitals and municipalities within the metropolitan area of San Salvador, traditionally included in development plans, have access to resources, and integrate political, economic and social activities, all of which impacts their development.

Prioritization of needs is calculated by multiplying. First priority Multiplied by 4, Second Priority Multiplied by 3, Third priority Multiplied by 2, and Fourth priority Multiplied by 1.

The number of times a need appears as a priority is by the corresponding factor, (1-4) and thus a weighted qualification is obtained, establishing the most important needs for the municipalities. (See Graph below).

The following chart shows the needs analysis for the four types of municipalities, with the weighted qualification in parenthesis.

NEEDS ANALYSIS OF SMALL SIZED MUNICIPALITIES

NEEDS	PRIORITIES				
	1	2	3	4	Total
Potable water	48	14	14	15	91
	(192)	(42)	(28)	(15)	(277)
Street or road	24	24	32	20	100
	(96)	(72)	(64)	(20)	(252)
School	15	22	23	12	72
	(60)	(66)	(46)	(12)	(184)
Block pavement	10	9	8	8	35
	(40)	(27)	(16)	(8)	(91)
Community Center	12	7	3	6	26
	(48)	(21)	(6)	(6)	(81)
Townhall	8	9	6	8	31
	(32)	(27)	(12)	(8)	(79)
Electric power	6	9	7	13	35
	(24)	(27)	(14)	(13))	(78)

Clinic	7	9	7	6	31
	(28)	(27)	(14)	(6)	(75)
Bridge	6	9	7	3	25
	(24)	(27)	(14)	(3)	(68)
Sewage	0	10	8	5	23
	(0)	(30)	(16)	(5)	(23)
Market	4	6	2	7	19
	(16)	(18)	(4)	(7)	(45)
Park	2	6	3	4	15
	(8)	(18)	(6)	(4)	(36)

Number of municipalities who answered the questionnaire: 151

NEEDS ANALYSIS OF MEDIUM SIZE MUNICIPALITIES

NEEDS	PRIORITIES				
	1	2	3	4	Total
Potable water	7	1	2	1	15
	(28)	(3)	(4)	(1)	(36)
School	4	4	2	3	13
	(16)	(12)	(4)	(3)	(35)
Block pavement	2	2	1	3	8
	(8)	(6)	(2)	(3)	(19)
Street or road	0	2	4	2	8
	(0)	(6)	(8)	(2)	(16)
Electric power	1	1	2	3	7
	(4)	(3)	(4)	(3)	(14)
Clinic	0	3	2	0	5
	(0)	(9)	(4)	(0)	(13)
Market	2	1	1	0	4
	(8)	(3)	(2)	(0)	(13)
Bridge	1	2	1	0	4
	(4)	(6)	(2)	(0)	(12)
Sewage	1	2	0	1	4
	(4)	(6)	(0)	(1)	(11)
Slaughterhouse	1	1	0	1	3
	(4)	(3)	(0)	(1)	(8)
Refuse	0	0	2	0	2
	(0)	(0)	(4)	(0)	(4)

Number of municipalities: 29

NEED ANALYSIS OF LARGER MUNICIPALITIES

NEEDS	PRIORITIES				
	1	2	3	4	Total
Potable water	4	1	2	2	9
	(16)	(3)	(4)	(2)	(25)
Streets or roads	1	4	1	1	7
	(4)	(12)	(2)	(1)	(17)
Bridge	3	0	0	0	3
	(12)	(0)	(0)	(0)	(12)
School	0	3	1	0	4
	(0)	(9)	(2)	(0)	(11)
Clinic	2	0	1	0	3
	(8)	(0)	(2)	(0)	(10)
Sports ground	0	2	0	1	3
	(0)	(6)	(0)	(1)	(7)
Sewage	0	1	0	3	4
	(0)	(3)	(0)	(3)	(6)
Electric power	0	0	2	2	4
	(0)	(0)	(4)	(2)	(6)

Number of municipalities: 16

NEEDS ANALYSIS OF MAJOR MUNICIPALITIES

MAJOR

NEEDS	PRIORITIES				
	1	2	3	4	Total
Potable water	2	4	5	1	12
	(8)	(12)	(10)	(1)	(31)
Electric power	4	1	4	4	13
	(16)	(3)	(8)	(4)	(31)
Refusal collection	5	0	3	2	30
	(20)	(0)	(3)	(2)	(30)
Street or road	3	5	1	1	10
	(12)	(15)	(2)	(1)	(30)
Market	2	7	0	1	10
	(0)	(21)	(0)	(1)	(30)
Bridge	1	1	2	2	9
	(16)	(3)	(4)	(2)	(25)
School	3	3	1	1	8
	(12)	(9)	(2)	(1)	(24)
Cemetery	1	0	3	1	5
	(4)	(0)	(6)	(1)	(11)
Sewage	0	3	0	1	4
	(0)	(9)	(0)	(1)	(10)
Park	0	1	2	1	4
	(0)	(3)	(4)	(1)	(8)
Sports ground	0	1	0	3	4
	(0)	(3)	(0)	(3)	(6)

Number of Municipalities: 26

ANNEX 2

DIAGNOSTICO DE NECESIDADES DE AGUA POTABLE EN COMUNIDADES ATENDIDAS POR

D I D E C O

COMUNIDAD	MUNICIPIO	DEPARTAMENTO	NO. DE FAMILIAS	AREA KM2	TIPO DE SUELO	NIVEL FREATICO MTS.	ABASTECIMIENTO ACTUAL	ORGANIZACION EXISTENTE	TRES PERSONAS QUE MAS SE INTERESAN POR LA COMUNIDAD
CANTON CATARINA	SAN FCO. MENENDEZ	AHUACHAPAN	150	4.00	ARCILLOSO	6	POZO-RIO	DIRECTIVA	ROBERIO LAZO, JUAN J. MARTINEZ, RICARDO MENDOZA
COL. LA ISLA, CANTON CARA SUCIA	SAN FCO. MENENDEZ	AHUACHAPAN	115	0.50	ARCILLOSO	6	POZO-RIO	DIRECTIVA	FCA. MENJIVAR, ROBERTO LOPEZ, MANUEL MARTINEZ
CANTON LA ESPERANZA	ATIQUIZAYA	AHUACHAPAN	50	8.00	ARCILLOSO	20	TANQUE CAPT.	DIRECTIVA PRO MEJOR.	GREGORIO CHICHILLA, JOSE N. GOCHEZ, EDILBERTO RECINOS
CANTON PEPENANCE	ATIQUIZAYA	AHUACHAPAN	400	15.00	ARCILLOSO	16	TANQUE CAPT.	DIRECTIVA PRO MEJOR.	NOE CASTRO, YOHALMO MANGANDI, MANUEL FIGUEROA
CANTON LOMAS DE ALARCON	ATIQUIZAYA	AHUACHAPAN	300	8.00	ARCILLOSO	16	NACIMIENTO	COCARA	CONCEPCION AGUILAR, RICARDO QUEZADA, RAMON VILLALTA
CANTON PARAISO	TURIN	AHUACHAPAN	150	10.00	ARCILLOSO	20	POZO	DIRECTIVA PRO MEJOR.	PEDRO A. HERRERA, MANUEL CARTAGENA, CRUZ A. LOPEZ
CANTON LA CONCEPCION	SAN PEDRO PUXTLA	AHUACHAPAN	100	4.00	TIERRA FERTIL	25	NACIMIENTO.-LLOVIDA	DIRECTIVA COMUNAL	JUAN F. VASQUEZ, MANUEL ALEGRIA, AGUSTIN AGUILERA
CANTON MORROCRANCE ARRIBA	GUAYMANGO	AHUACHAPAN	138	10.00	TIERRA NEGRA		RIO	DIRECTIVA	FREDY VIZCARRA, SANTOS ARTERO, JOSE F. ESCALANTE
LA FORTUNA	SANTA ANA	SANTA ANA	150	1.50	ARCILLOSO	5	COMPRADA	DIRECTIVA PRO MEJOR.	DELMI CAMPOS, ANDREA AQUINO, CARMELINA AQUINO
COLONIA PROVIDENCIA, CANTON PRIMAVERA	SANTA ANA	SANTA ANA	350	1.50	ARCILLOSO	6	COMPRADA	DIRECTIVA PRO MEJOR.	MARIA DE MENDOZA, MERCEDES ALFARO, JULIA CONSUEGRA
COLONIA SOMAYCO, CANTON SANTA ISABEL	SANTA ANA	SANTA ANA	60	0.50	ARCILLOSO	5	COMPRADA	DIRECTIVA PRO MEJOR.	EDUARDO SALAZAR, PEDRO GIRON, OFELIA VENTURA
CANTON LAS ARADAS, CASERIO EL BEJUCO	SANTA ANA	SANTA ANA	75	3.00	ARCILLOSO	60	COMPRADA	PIRAMIDAL	ANTONIA VIDES, DANIEL INTERIANO, WILFREDO MENDEZ
COLONIA SANTA GERTRUDIS	SANTA ANA	SANTA ANA	80	0.50	ARCILLOSO	10	POZOS	PIRAMIDAL	JORGE RIVERA, GILBERTO AMAYA, RIGOBERTO MORAN
COLONIA ISRAEL, CASERIO EL CASCAJAL	SANTA ANA	SANTA ANA	500	1.50	ARCILLOSO	18	PILA PUBLICA	PIRAMIDAL	ESAU ESTRADA, ANTONIO MARTINEZ, MANUEL ESTRADA
COLONIA GRESIAL	SAN SEBASTIAN SALIT.	SANTA ANA	120	1.00	ROCOSO	13	POZO	PIRAMIDAL	BERTULIO MORENO, MIGUEL A. GUZMAN, ERNESTO ELIZONDO
COL. SAN MARTIN BUENAVISTA Y SAN MIGUEL	CHALCHUAPA	SANTA ANA	250	3.00	TIERRA NEGRA	70	COMPRADA	ADESCO	ABILIO VIDAL, CARLOS MORAN, MARIA LUZ TORRES
COLONIA LAS MARGARITAS	CHALCHUAPA	SANTA ANA	125	2.00	TIERRA NEGRA	90	POZO	DIRECTIVA	JUAN ZUNIGA, ODILIA ERAZO, RAUL LIMA
COLONIA SAN ANTONIO	COATEPEQUE	SANTA ANA	1250		ARCILLOSO	300	NACIMIENTO	DIRECTIVA	SALOMON MARTINEZ, MARIA A. GARCIA, MARIA D. RODRIGUEZ
COLONIA LAS DELICIAS	COATEPEQUE	SANTA ANA	1000		TALPETATE		CHORRO PUBLICO	DIRECTIVA	CRUZ GARCIA, ESPERANZA GALICIA, PEDRO TAMACAS
COLONIA LA CRIBA	CANDELARIA FRONT.	SANTA ANA	250	3.00	ARCILLOSO	60	POZOS	DIRECTIVA	MIGUEL GONZALEZ, FRANCISCO LANDAVERDE, SR. RAMIREZ
CASERIO EL PICHICHE	CANDELARIA FRONT.	SANTA ANA	70	2.00	TALPETATE	60	LLUVIA, TANQUES	DIRECTIVA	ADRIAN GONZALEZ, JOSE MARIA GODOY, ADRIAN MENDOZA
CASERIO VALLE NUEVO, C/ZACAMIL	CANDELARIA FRONT.	SANTA ANA	45	3.00	ARCILLOSO	50	POZOS, TANQUES	COMITE DES. SOCIAL	JESUS TORRES, MERENCIANO BOSQUE, JOSE ZALDANA
CANTON LOS ANGELES	SAN ANTONIO PAJONAL	SANTA ANA	150	3.00	ARCILLA-ROCA	6	LAGO GUIJA		JUAN LINARES, GONZALO LINARES, AQUILINO QUINTANA
CANTON SANTO TOMAS	TEXISTEPEQUE	SANTA ANA	225	4.00	FCO. ARCILLOSO	8	PILAS, POZO	DIRECTIVA COMUNAL	ELBA DUARTE, DORA CARCAMO, FRANCISCO CALDERON
CASERIO OJOS DE AGUA, CANTON SAN MIGUEL	TEXISTEPEQUE	SANTA ANA	150	1.50	FCO. ARCILLOSO	6	POZO	DIRECTIVA COMUNAL	CANDIDO CARRILLO, IGNACIO HERNANDEZ, CARLOS MASCAL
CANTON EL TABLON	METAPAN	SANTA ANA	100	2.00	ARCILLOSO	80	RIO	DIRECTIVA COMUNAL	JUAN J. MARTINEZ, CARLOS SARMIENTO, ULISES ESCARATE
CANTON LA JOYA	METAPAN	SANTA ANA	400	4.00	FCO. ARCILLOSO	8	POZOS	DIRECTIVA COMUNAL	VIRGILIO MAZARIEGO, ROSARIO Y RIGOBERTO RODRIGUEZ
CANTON EL CAPULIN	METAPAN	SANTA ANA	395	3.00	ARCILLOSO	15	POZOS	DIRECTIVA COMUNAL	LUIS FIGUEROA, HECTOR UMANA, CONRADO UMANA
COLONIA SAN JOSE	METAPAN	SANTA ANA	325	2.00	FCO. ARCILLOSO	6	POZOS, PILAS	DIRECTIVA COMUNAL	CANDELARIO BAIRES, JUAN SANDOVAL, VIRGINIA ACOSTA
CANTON EL CHISTE	METAPAN	SANTA ANA	150	2.00	QUEBRADO	6	POZO	DIRECTIVA COMUNAL	HECTOR UMANA, ALBERTO ARROYO, ROMULO PEREZ
CASERIO EL DESAGUE, CANTON GUIJA	METAPAN	SANTA ANA	400	4.00	QUEBRADO	3	LAGO GUIJA	DIRECTIVA COMUNAL	MACARIO SANTOS, GREGORIO RAMOS, MARIO GONZALEZ
CAS. LA CONCHAGUA, CANTON LAS PIEDRAS	METAPAN	SANTA ANA	325	3.00	QUEBRADO	6	NACIMIENTO	DIRECTIVA COMUNAL	ARTURO HERRERA, IRMA DE ZAMORA, ANTONIO PEREZ
CAS. EL COPANO, CANTON LAS PIEDRAS	METAPAN	SANTA ANA	250	2.50	QUEBRADO	20	TANQUE-AGUA LLUVIA	DIRECTIVA COMUNAL	GREGORIO MALDONADO, JOSE MARTINEZ, MAX. GARBERIA
CAS. COL. SAN FRANCISCO, C/BELEN GUIJA	METAPAN	SANTA ANA	450	5.00	ARCILLOSO	5	POZOS	DIRECTIVA COMUNAL	DOMINGO PERAZA, RAUL GIRON, GABRIEL UMANA
CANTON CUYUAPA ARRIBA	STA. CATARINA MAS.	SONSONATE	200	4.00	ARCILLOSO	12	RIO	DIRECTIVA PRO MEJOR.	CARLOS RAMIREZ, MISAEL RAMIREZ, JOSE LUIS MENDEZ
COLONIA LOS ANGELES, C/AGUA SANTA	SAN ANTO. DEL MONTE	SONSONATE	138	2.00	TALPETATE	8	POZO	DIRECTIVA PRO MEJOR.	JUAN MENDEZ, RAUL BAUTISTA, FCO. ZETINO
CASERIO EL NERA, CANTON METALIO	ACAJUTLA	SONSONATE	190	2.50	TALPETATE	8	POZOS	DIRECTIVA PRO MEJOR.	SERAFIN HERNANDEZ, JUAN ACOSTA, SOLEDAD HENRIQUEZ
COLONIA BUENOS AIRES, CANTON METALIO	ACAJUTLA	SONSONATE	140	1.50	TALPETATE	8	POZO	COMITE PRO MEJOR.	BARTOLOME AVALOS, JUVENTINO FINEDA, JOSEFINA LEMUS
CANTON TAICUILUJLAN	NAHUIZALCO	SONSONATE	50	4.00	ARCILLOSO	20	RIO	PRE-ASOCIACION	JOSE M. CRUZ, ANTONIO MUJUN, DINORA MORALES
CANTON ALEMAN	NAHUILINGO	SONSONATE	408	4.00	ARCILLOSO	5	POZOS	DIRECTIVA COMUNAL	GENARO ESQUIVEL, ISRAEL MENDOZA, JULIO GOMEZ
PENA PARTIDA	PUERTO LA LIBERTAD	LA LIBERTAD	350	1.00	ROCOSO	5	TANQUE CAPT.	DIRECTIVA MEJOR. COMUNAL	OCTAVIO CANAS, RAFAEL CARPIO
COLONIA 2 DE MAYO	JAYAQUE	LA LIBERTAD	75	4.00	TIERRA	8	RIO	DIRECTIVA COMUNAL	PEDRO GARCIA, CARLOS CALLEJAS
CANTON EL FARO	COMASAGUA	LA LIBERTAD	100	8.00	PEDREGOSO	14	RIO, POZO	DIRECTIVA COMUNAL	HECTOR CHICAS, ELSA HENRIQUEZ, CARLOS VALLE
CANTON MISATA	TEOTEPEQUE	LA LIBERTAD	500	8.00	PEDREGOSO		RIO	COMITE DE SALUD	JOSE MENJIVAR, MANUEL MENJIVAR, SANTIAGO MENJIVAR
CANTON EL MATAZANO	SANTA TECLA	LA LIBERTAD	750	20.00	QUEBRADO	60	PILAS PUBLICAS	DIRECTIVA COMUNAL	TERESA DE SOSA, NOEMI RAMOS, JOSE E. MARTINEZ
ZAMORA SIVES	NUEVO CUSCATLAN	LA LIBERTAD	62	0.50			RIO	DIRECTIVA COMUNAL	VICTORIA BONILLA, GUILLERMINA TORRES, VICITACION GONZ.

DIAGNOSTICO DE NECESIDADES DE AGUA POTABLE EN COMUNIDADES ATENDIDAS POR DIDECO

COMUNIDAD	MUNICIPIO	DEPARTAMENTO	NO. DE FAMILIAS	AREA KM2	TIPO DE SUELO	NIVEL FREATICO MTS.	ABASTECIMIENTO ACTUAL	ORGANIZACION EXISTENTE	TRES PERSONAS QUE MAS SE INTERESAN POR LA COMUNIDAD
EL PAJARITO	NUEVO CUSCATLAN	LA LIBERTAD	25	0.50			COMPRADA	DIRECTIVA COMUNAL	JUANA DE CORNEJO, JULIA JIMENEZ, EMERITA CARRANZA
ALTOS DE CUSCATLAN	NUEVO CUSCATLAN	LA LIBERTAD	150	0.20	SUELO BLANDO		POZO	DIRECTIVA COMUNAL	MARIA DE MEZA, JUANA KORATAYA, MARIA DEL C. PONCE
LA ESPERANZA	NUEVO CUSCATLAN	LA LIBERTAD	125	1.00		8	COMPRADA	DIRECTIVA COMUNAL	IDALIA MARROQUIN, ENA GRANDE, AMILCAR AGUIRRE
CANTON EL POTONDILLAL	COLON	LA LIBERTAD	414	6.00	TIERRA	50	COMPRADA	COMITE PRO MEJORAMIENTO	FAUSTO GALDAMEZ, CRISTOBAL PEREZ, ALVARO MORIA
CHAPASSALITO, CANTON EL CHAPULIN	COLON	LA LIBERTAD	204	0.20	TIERRA NEGRA		COMPRADA	COMITE PRO MEJORAMIENTO	EULALIO AYALA, ROBERTO JIMENEZ, JOSE R. MEJIA
COLONIA MIRAMAR NO. 1	ZARAGOZA	LA LIBERTAD	180	0.25	ARCILLOSO	8	COMPRADA	DIRECTIVA	JOSE SIGUENZA, EMILIO PERLA, CARMEN LOPEZ
COLONIA SAN ANTONIO NO. 1	ZARAGOZA	LA LIBERTAD	86	0.25	ARCILLOSO	12	CHORRO COMUNAL	DIRECTIVA	EDUARDO MENJIVAR, NATIVIDAD SILVESTRE, FELIX ARTEAGA
CASERIO LAS PALMAS, CANTON EL BORRILLO	ZARAGOZA	LA LIBERTAD	93	2.00	ARCILLOSO	9	CHORRO COMUNAL	DIRECTIVA	JUAN CARRANZA, M. ALICIA GUARDON, MARIA V. FERNANDEZ
COLONIA SAN ANTONIO NO. 2	ZARAGOZA	LA LIBERTAD	76	0.25	ARCILLOSO	10	COMPRADA	DIRECTIVA	JOSE E. CALERO, ARTURO VASQUEZ, RUDENCIO CIENFUEGOS
CANTON EL ESCALON	SAN JOSE VILLANUEVA	LA LIBERTAD	380	3.50	ARCILLOSO	10	POZOS ARTESIANOS	DIRECTIVA	MARGOT MONTERROSA
EL MATAZANO No. 2	SAN JOSE VILLANUEVA	LA LIBERTAD	56	2.00	PEDREGOSO	5	RIO	DIRECTIVA	PABLO MORALES, MARIA RAMIREZ, JOSEFINA GOMEZ
COLONIA SAN VICENTE	SAN JUAN OPICO	LA LIBERTAD	26	0.01	ARCILLOSO		INDIVIDUAL	COMITE PRO MEJORAMIENTO	JOSE FLORES, FIDEL PINEDA, BLANCA PINEDA
CANTON SAN ANTONIO TEHUICHO	SAN JUAN OPICO	LA LIBERTAD	48	1.00	ARCILLOSO		INDIVIDUAL	COMITE PRO MEJORAMIENTO	JOSE SANCHEZ, GERARDO MEJIA, JOSE AZCUNAGA
CASERIO CASA DE TABRO, C/SANTA LUCIA	CIUDAD ARCE	LA LIBERTAD	56	1.00	ARCILLOSO			COMITE PRO MEJORAMIENTO	JUAN MAJANO, LUCIA PEREZ, BENJAMIN GUERRA
CANTON PIEDRAS GORDAS	SAN MIGUEL DE MERC.	CHALATENANGO	34	4.00	FCO. ARCILLOSO	10	POZO, MANANTIAL	DIRECTIVA PRO MEJOR.	ELIAS OLIVA, FERNANDO GUARDADO, ANGEL ORTIZ
CANTON EL SALITRE	SAN MIGUEL DE MERC.	CHALATENANGO	74	5.00	ARCILLOSO	6	POZO, MANANTIAL	DIRECTIVA PRO MEJOR.	ESAIAS ALBERTO, FELIX SERRANO, ROMULO ALBERTO
COLONIA LAS BRISAS	CHALATENANGO	CHALATENANGO	30	1.00	ARCILLOSO	6	POZO, RIO	COMITE PRO MEJORAMIENTO	MARCO HENRIQUEZ, ABEL HERNANDEZ, DOLORES TOBIAS
CASERIO EL CHUPTAL, CANTON UPATORO	CHALATENANGO	CHALATENANGO	45	8.00	ARCILLOSO	10	RIO, MANANTIAL	COMITE PRO MEJORAMIENTO	MARIA DE TOVAR, ANA DE TOBAR, ALFONSO ZELAYA
BARRIO LA SIERPE, SECTOR 3 Y 4	CHALATENANGO	CHALATENANGO	180	1.00	PEDREGOSO	0.3	RIO	DIRECTIVA PRO MEJOR.	ABRAHAM HERNANDEZ, ALEJANDRINA MONCADA, JULIO HERNANDEZ
CASERIO LAS CUEVITAS	CHALATENANGO	CHALATENANGO	17	1.00	ARCILLOSO	18	POZO, RIO	CLUB AMAS COMUNAL	JOSE MEJIA, FIDENCIO MEJIA, ORLANDO MEJIA
CANTON COSTA MARINA	AZACUALPA	CHALATENANGO	198	3.00	TALPETATE, PED.	0.4	POZO PRIVADO	DIRECTIVA PRO MEJOR.	ANA RODRIGUEZ, JOSE HERNANDEZ, MIGUEL FRANCO
CANTON EL LLANO	AZACUALPA	CHALATENANGO	189	1.00	ARCILLOSO	0.7	POZO PRIVADO	DIRECTIVA PRO MEJOR.	AMALIA GUARDADO, PABLO ARTEAGA, LETICIA ROMERO
CANTON GUTIERREZ	DULCE NOMBRE DE MAR.	CHALATENANGO	45	2.50	FCO. ARENOSO	13	RIO	DIRECTIVA PRO MEJOR.	JUAN CLAVEL, EDUARDO ALVARENGA, MANUEL ARREGO
CANTON EL TABLON	EL PARAISO	CHALATENANGO	261	3.00	FCO. ARCILLOSO	10	POZO	DIRECTIVA	OVIDIO ORELLANA, VICENTE QUIJADA, GABRIEL TOVAR
CANTON VALLE NUEVO	EL PARAISO	CHALATENANGO	35	2.00	FCO. ARCILLOSO	2	POZO	DIRECTIVA PRO MEJOR.	JULIO TEJADA, JOSE FUENTES, ANTONIO FUENTES
CANTON BARILLAS	COMALAPA	CHALATENANGO	73	2.00	FCO. ARENOSO	12	POZO	DIRECTIVA PRO MEJOR.	JESUS MORAN, DAMASCO ALVARENGA, VICTOR MORAN
CANTON ACHIOTES	COMALAPA	CHALATENANGO	255	7.00	FCO. ARENOSO	25	POZO	COMITE PRO MEJORAMIENTO	EDITO PERAZA, MIRTALA ORTEGA, MIGUEL MELARA
CANTON EL JOCOTILLO	CONCEPCION QUEZALT.	CHALATENANGO	65	4.50	FCO. ARENOSO	20	MANANTIAL	COMITE PRO MEJORAMIENTO	ENRIQUE URBINA, JOSE GUARDADO, ROSA CASTRO
CASERIO EL COBANO	SANTA RITA	CHALATENANGO	66	2.00	FCO. ARENOSO	13	POZO DOMICILIAR	DIRECTIVA PRO MEJOR.	EXEQUIEL MELGAR, CARLOS FRANCO, JOSE ECHEVERRIA
CANTON TOBIAS	SANTA RITA	CHALATENANGO	98	2.00	FCO. ARENOSO	14	POZO	DIRECTIVA PRO MEJOR.	JOSE MELGAR, NARCISO MATA, IRMA MATA
CANTON PIEDRAS GORDAS	SANTA RITA	CHALATENANGO	594	9.00	FCO. ARCILLOSO	25	POZO, RIO	DIRECTIVA PRO MEJOR.	FLORENTINA LOPEZ, LUCIO GUIJADA, JUAN F. ROMERO
CANTON LA GRANADILLA	LA PALMA	CHALATENANGO	180	12.00	FCO. ARCILLOSO	0	NACIMIENTO	COMITE DE DESARROLLO	CONSUELO SANTAMARIA, FRANCISCO FLORES, MANUEL SALGUERO
CAS. LAS DELICIAS, C/SAN JOSE SACARA	LA PALMA	CHALATENANGO	60	3.50	ARENA, ARCILLA	0	NACIMIENTO	COMITE DE DESARROLLO	ARSENIO FLORES, ADULFO REYES, TIMOTEO RIVERA
CANTON EL PEPETO	LA PALMA	CHALATENANGO	177	20.00	ARENA, ARCILLA	0	MANANTIAL	COMITE DE DESARROLLO	ANTONIO RODRIGUEZ, ALBERTO MALDONADO, RAUL RODRIGUEZ
CAS. EL CRISTAL, C/TALCHALOYA	LA PALMA	CHALATENANGO	50	2.50	TALPETATE	0	MANANTIAL	COMITE PRO MEJORAMIENTO	ANDRES LANDAVERDE, AGUSTIN MURCIA, EFRAIN LANDAVERDE
CAS. LOS PINOS, C/SANTA ROSA	SAN IGNACIO	CHALATENANGO	40	3.00	TALPETATE	0	NACIMIENTO	COMITE PRO MEJORAMIENTO	SANTOS CALDERON, ESTANISLAO REYES, JUAN MANCIA
CANTON EL CENTRO	SAN IGNACIO	CHALATENANGO	150	4.00	FCO. ARCILLOSO	0	MANANTIAL	COMITE DES. COMUNAL	BELARMINO GRANADOS, FAUSTINO ALVARADO, RAFAEL REGALADO
CANTON PIO CHIQUITO	SAN IGNACIO	CHALATENANGO	50	15.00	FCO. ARCILLOSO	0	NACIMIENTO	COMITE DES. COMUNAL	ADELMO VASQUEZ, ANGEL HUEZO, FERNANDO GALDAMEZ
CANTON EL PINAR	SAN IGNACIO	CHALATENANGO	100	3.00	FCO. ARCILLOSO	0	MANANTIAL	COMITE DES. COMUNAL	GONZALO MENA, ADRIAN POSADA, SAMUEL LANDAVERDE
CANTON SANTA ROSA	SAN IGNACIO	CHALATENANGO	85	2.00	FCO. ARCILLOSO	0	NACIMIENTO	SOC. PADRES DE FAMILIA	VALERIANO LOPEZ, ANTONIO LOPEZ, RAYMUNDO ESAZO
CANTON SAN RAMON	CITALA	CHALATENANGO	180	10.00	ARCILLOSO	0	NACIMIENTO	COMITE DES. COMUNAL	CATARINO CASTANEDA, JOSE DIAZ, FRANCISCO GUEVARA
COLONIA ALCAINE No. 2	SAN MARCOS	SAN SALVADOR	1000	3.00	QUEBRADO		GRAVEDAD	DIRECTIVA COMUNAL	PEDRO BAIRES, FIDEL VASQUEZ, EUGENIA PENA
COLONIA LOS ANDES No. 2	SAN MARCOS	SAN SALVADOR	500	2.00	QUEBRADO		ACARREADA	DIRECTIVA COMUNAL	PABLO ALONSO, MARINA MARTINEZ, JUAN BLAS HERNANDEZ
COLONIA LOS ALPES	SAN MARCOS	SAN SALVADOR	1500	3.00	QUEBRADO		COMPRADA	DIRECTIVA COMUNAL	MAURICIO MAZARIEGO, ANA DE GUADRON, MARGARITA ALFARO
SAN LUIS PORTALES, SAN JACINTO	SAN SALVADOR	SAN SALVADOR	245	0.01	ARCILLOSO	100	POZO	DIRECTIVA COMUNAL	GONZALO HERNANDEZ, ALEJANDRO GUIDO, DANIEL BARAHONA
OJO DE AGUA	SAN SALVADOR	SAN SALVADOR	78	0.01	ARCILLOSO	1	NACIMIENTO	DIRECTIVA COMUNAL	CLARA ORELLANA, JOSE MARTINEZ, MAXIMILIANO VASQUEZ

DIAGNOSTICO DE NECESIDADES DE AGUA POTABLE EN COMUNIDADES ATENDIDAS POR

D I D E C O

COMUNIDAD	MUNICIPIO	DEPARTAMENTO	NO. DE FAMILIAS	AREA KM2	TIPO DE SUELO	NIVEL FREATICO MTS.	ABASTECIMIENTO ACTUAL	ORGANIZACION EXISTENTE	TRES PERSONAS QUE MAS SE INTERESAN POR LA COMUNIDAD
COLONIA 10 DE OCTUBRE	SAN SALVADOR	SAN SALVADOR		0.01	TIERRA BLANCA	1	COMPRADA	DIRECTIVA COMUNAL	BERTA ARGUETA, EVELIN CORNEJO, ELBA ARGUETA
CANTON EL CIPRES	SANTO TOMAS	SAN SALVADOR	40	3.50	TIERRA NEGRA		CHORRO PUBLICO	DIRECTIVA COMUNAL	DONITILA HERNANDEZ, TERESA PEREZ, MARIA LUZ HERNANDEZ
COLONIA LAS MERCEDES, C/CHALTIPA	STGO. TEXACUANGOS	SAN SALVADOR	150	4.00	ARENOSO	10	SERV. DOMICILIAR	DIRECTIVA COMUNAL	MARINA DE CARBAJAL, REMIGIO MORAN, POLICARPIO TORRES
ADESCO FLORES SECTOR No. 4	ILOPANGO	SAN SALVADOR	400			9	PIPAS	DIRECTIVA CENTRAL	FRANCISCO BARAHONA, DANIEL BELTRAN, DODAFREDO HERNANDEZ
COL. SAN ANTONIO No. 1 Y No. 2	APOPA	SAN SALVADOR	50	0.01		30	POZOS	DIRECTIVA	IVAN CONTRERAS, RAYMUNDO GUEVARA, PAULA ROSA
COLONIA LAS CANAS	APOPA	SAN SALVADOR	60	0.01	ARCILLOSO	35	POZOS	DIRECTIVA	BERTA CALLES, RODOLFO CALLES, ISABEL AYALA
MONTECARLO	CIUDAD DELGADO	SAN SALVADOR	100	0.01	ARCILLOSO	25	COMPRADA	DIRECTIVA COMUNAL	BLANCA ACOSTA, ANA SALINAS, VICTORINA DURAN
CASERIO USALCO	PERULAPIA	CUSCATLAN	57	1.40	ARENOSO	7	MANANTIALES	DIRECTIVA COMUNAL	JUAN M. ZELADA, ERNESTO CASTRO, MANUEL BARAY
CANTON BARRIO ABAJO	STA. CRUZ ANALQUITO	CUSCATLAN	200	18.00	TIERRA BLANCA	5	POZOS	DIRECTIVA	TOMAS JUAREZ, RAFAEL ALVAREZ, MARIA A. ROSALES
CANTON EL COFINAL	SAN RAFAEL CEDROS	CUSCATLAN	55	2.00	ARCILLOSO	25	POZOS	DIRECTIVA	CARMEN MUNOZ, MARIA L. UMANA, RAMONA SANCHEZ
CANTON SANTA LUCIA	EL CARMEN	CUSCATLAN	180	12.00	ARCILLOSO	30	POZOS	DIRECTIVA	GUMERCINDA HERRERA, JESUS HERNANDEZ, SOFIA HERNANDEZ
CANTON SAN ANDRES	MONTE SAN JUAN	CUSCATLAN	800	27.00	ARCILLOSO	10	NACIMIENTO	DIRECTIVA	ALEJANDRO RUIZ, ESTANISLAO PEREZ, FRANCISCO SANTOS
AGUA CALIENTE	SAN JOSE GUAYABAL	CUSCATLAN	400	10.00	ARCILLOSO	12	POZO	COMITE PRO MEJORAMIENTO	VICTOR TROJ, CARLOS ALAS, MANUEL MARTINEZ
SANTA ISABEL SECTOR 1	SAN RAMON	CUSCATLAN	30	4.50	TIERRA BLANCA	350	ARROYOS	DIRECTIVA DESAR. COMUNAL	RAFAEL ALEGRIA, ELIAS CRUZ, MARIA INES FLORES
CANTON CANDELARIA	SAN FCO. CHINAMECA	LA PAZ	500	1.00	ARCILLOSO	100	NACIMIENTO	COMITE PRO MEJORAMIENTO	FRANCISCO GUZMAN, BONIFACIO MARMOL, CONCEPCION GONZALEZ
SAN FRANCISCO CHINAMECA	SAN FCO. CHINAMECA	LA PAZ	6000	1.00	ARCILLOSO	40	NACIMIENTO	COMITE PRO DESARROLLO	MEDARDO SANCHEZ, MARIA PENA, JUAN CRUZ
SAN JOSE OBRAJUELO	SAN RAFAEL OBRAJUELO	LA PAZ	110	2.00	ARCILLOSO	20	NACIMIENTO	DIRECTIVA	AGUSTIN PORTILLO, PEDRO GONZALEZ, JORGE MOLINA
SAN ANTONIO LOS BLANCOS	SAN LUIS LA HERRAD.	LA PAZ	585	5.00	ARENOSO	3	POZOS	DIRECTIVA PRO AGUA	HERNAN CORTEZ, VICTOR CARDOZA, JOSE MIRANDA
CANTON EL LLANO	SAN LUIS LA HERRAD.	LA PAZ	500	4.00	ARENOSO	15	RIOS	COMITE PRO MEJORAMIENTO	JOSE ESCOBAR, ALVARO GARCIA, MARTA CUATROCAMPOS
CANTON COMALAPA	SAN JUAN TALPA	LA PAZ	600	1.50	TALPETATE		RIOS, POZOS	DIRECTIVA PRO MEJORAM.	CARLOS REYES, ESPERANZA GOMEZ, ANTONIO CORNEJO
CANTON EL SAUCE	SANTIAGO NONUALCO	LA PAZ	500	3.00	ARENOSO	15	RIO	COMITE PRO MEJORAMIENTO	LAZARO CHARITA, JOSE DIONISIO, NICOLAS DE LEON
SAN PEDRO LA PALMA	TAPALHUACA	LA PAZ	500	2.00	ARCILLOSO	15	NACIMIENTOS	COMITE PRO MEJORAMIENTO	EUGENIO TORRES, MARIA RECINOS, DAVID PORTILLO
CANTON LA BASA	TAPALHUACA	LA PAZ	550	2.00	VARIABLE	60	VERTIENTES	COMITE PRO MEJORAMIENTO	JOSE GALVEZ, JOSE GUIDO, MARIA ORELLANA
CANTON CONCEPCION LOURDES	SAN EMIGDIO	LA PAZ	500	2.00	ARCILLOSO	200	ACARREADA	DIRECTIVA PRO MEJORAM.	RAMON MOLINA, JULIAN MOLINA, RAYMUNDO PEREZ
CANTON EL SOCORRO	SAN ANTONIO MASAHUAT	LA PAZ	500	2.00	VARIABLE	100	VERTIENTES	DIRECTIVA PRO MEJORAM.	JOSE PEREZ, PAULINA MARTINEZ, ERLINDA GONZALEZ
CANTON SAN RAFAEL	ZACATECOLUCA	LA PAZ	200	2.00	ARCILLOSO	8	POZOS	DIRECTIVA PROGRESO	LINDOV CARRANZA, BLANCA JIMENEZ, EDICACION ARRIAZA
COLONIA EL NILO	ZACATECOLUCA	LA PAZ	80	1.50	ARCILLOSO	2	RIO	DIRECTIVA	PASTOR AREVALO, MARIANO SERRANO, ULISES TORRES
CUYULTITAN	CUYULTITAN	LA PAZ	1000	8.00	ARCILLOSO	.6	NACIMIENTOS	COMITE PRO MEJORAMIENTO	OSCAR CALDERON, ANDRES AREVALO, SAUL ORELLANA
CANTON BARAHONA	SAN PEDRO MASAHUAT	LA PAZ	800	4.00	ARCILLOSO	100	NACIMIENTO	COMITE PRO MEJORAMIENTO	ABELARDO LARA, LUIS LOPEZ, TEOFILO MENJIVAR
CANTON SANTA CRUZ EL TUNAL	EL ROSARIO	LA PAZ	200	3.00	APENOSO	15	POZO	DIRECTIVA PRO MEJORAM.	MARGARITA SANDOVAL, RAMON MUNGUIA, LAZARO MENJIVAR
CANTON EL CHILE	SAN JUAN NONUALCO	LA PAZ	800	1.00	FRANCO		VERTIENTES	ORG. DESARROLLO COMUNAL	CARLOS DOANTES, RAUL CAMPOS, JESUS MENDOZA
COLONIA LA FORTALEZA	SAN LUIS	LA PAZ	40	2.00	ARCILLOSO	10	RIO	DIRECTIVA	CARMEN DE HERNANDEZ, BERTA BARRERA, MARGARITA ALEMAN
CANTON SAN FRANCISCO	SAN LORENZO	SAN VICENTE	500	5.00	ARCILLOSO	60		DIRECTIVA DESAR. COMUNAL	LIDIA CASTILLO, PASTOR CORDOVA, FRANCISCO CASTILLO
CANTON SANTA LUCIA	SAN LORENZO	SAN VICENTE	400	4.00	ARCILLOSO	50	POZOS DE INV.	DIRECTIVA DESAR. COMUNAL	ROBERTO FLORES, JESUS CORDOVA, HUMBERTO BARRERA
CANTON LA CRUZ	SAN LORENZO	SAN VICENTE	400	3.00	ARCILLOSO	60	QUEBRADA	DIRECTIVA DESAR. COMUNAL	MANUEL PALACIOS, EMILIA BARRERA, NATIVIDAD AYALA
CANTON LAS ANIMAS	SAN LORENZO	SAN VICENTE	600	6.00	ARCILLOSO	60	QUEBRADA	DIRECTIVA DESAR. COMUNAL	SANTIAGO MARTINEZ, EVELIO BARRERA, FRANCISCO BARRERA
CASERIO LOS CURIAS, CANTON LA CRUZ	SAN LORENZO	SAN VICENTE	300	1.00	ARCILLOSO	60	QUEBRADA	DIRECTIVA DESAR. COMUNAL	PEDRO CURIAS, RAFAEL CURIAS, ESTEBAN CURIAS
CAS. LAS AMAPOLAS, CANTON SAN FRANCISCO	SAN ILDEFONSO	SAN VICENTE	73	3.00	ARCILLOSO	18	NACIMIENTO	COMITE PRO MEJORAMIENTO	VIDAL FLORES, PABLO RUIZ, NICOLAS FLORES
CAS. EL POSTILLO, CANTON SAN FRANCISCO	SAN ILDEFONSO	SAN VICENTE	40	2.00	ARCILLOSO	20	NACIMIENTO	COMITE PRO MEJORAMIENTO	LUIS RUIZ, MIGUEL ANAYA, VIRGILIO RUIZ
CAS. EL DIVISADERO, C/CANDELARIA LEMPA	SAN ILDEFONSO	SAN VICENTE	65	2.00	ARCILLOSO	25	VERTIENTE	COMITE PRO MEJORAMIENTO	JOSE PINEDA, MARCOS CONSTANZA, JOSE RIVAS
CAS. SAN JOSE CUMISTE, C/CAMP. LEMPA	SAN ILDEFONSO	SAN VICENTE	100	4.00	TALPETATE	20	VERTIENTE	COMITE PRO MEJORAMIENTO	AGAPITO ALDANA, JULIO HERNANDEZ, LUIS BELTRAN
CAS. EL JICARO, CANTON SAN LORENZO	SAN ILDEFONSO	SAN VICENTE	45	2.00	PEDREGOSO	20	NACIMIENTO	COMITE PRO MEJORAMIENTO	HERNAN SOLANO, ERNAIDES ZAVALA, ALCIDES SOLANO
CANTON LAS LAJAS Y CANOAS	SAN ILDEFONSO	SAN VICENTE	150	5.00	PEDREGOSO	18	VERTIENTE	COMITE PRO MEJORAMIENTO	VIDAL TORRES, MARIETA CASTILLO, AMALDA LOPEZ
CANTON MARADIAGA	SAN ILDEFONSO	SAN VICENTE	260	4.00	PEDREGOSO	20	NACIMIENTO	COMITE PRO MEJORAMIENTO	RAUL MARAVILLA, DANIEL PANAMENO, RUFINO BARRIOS
CAS. EL TABLON, C/SAN JUAN DE MERINO	SANTA CLARA	SAN VICENTE	265	4.00	ARCILLOSO	50	VERTIENTE	COMITE PRO MEJORAMIENTO	BONIFACIO MARROQUIN, JOSE MARTINEZ, JUAN HERNANDEZ
CAS. MACASPILO, CANTON SANTA ROSA	SANTA CLARA	SAN VICENTE	350	6.00	ARCILLOSO	40	VERTIENTE	COMITE PRO MEJORAMIENTO	RAUL ALVARADO, BERTA ALVARADO, RUFINO VELASCO

DIAGNOSTICO DE NECESIDADES DE AGUA POTABLE EN COMUNIDADES ATENDIDAS POR DIDECO

COMUNIDAD	MUNICIPIO	DEPARTAMENTO	NO. DE FAMILIAS	AREA KM2	TIPO DE SUELO	NIVEL FREATICO MTS.	ABASTECIMIENTO ACTUAL	ORGANIZACION EXISTENTE	TRES PERSONAS QUE MAS SE INTERESAN POR LA COMUNIDAD
CAS. SAN LAZARO, CANTON SAN PEDRO	APASTEPEQUE	SAN VICENTE	800	5.00	ARCILLOSO	30	NACIMIENTO	DIRECTIVA	JOSE BERRIOS, MARTIN LAZO, LUIS RAMIREZ
CAS. LOS ESPINOS, CANTON CUYANTEPEQUE	SENSUNTEPEQUE	CABAÑAS	80	4.00	ARCILLOSO	30	RIO	DIRECTIVA COMUNAL	MARIANO IRAHETA, FRANCISCO BAIRES, MARGARITO BAIRES
CAS. LAS CORONAS, CANTON EL AGUACATE	SENSUNTEPEQUE	CABAÑAS	80	3.00	ARCILLOSO	20	MANANTIAL	DIRECTIVA COMUNAL	MARTIN HERNANDEZ, ANGEL HERNANDEZ, LITO HERNANDEZ
CAS. EL JUNQUILLO, CANTON EL AMATE	SENSUNTEPEQUE	CABAÑAS	90	4.00	ARCILLOSO	15	MANANTIAL	DIRECTIVA COMUNAL	JULIAN MORENO, JUAN AREVALO, DIONISIO MARTINEZ
CANTON RIO GRANDE	SENSUNTEPEQUE	CABAÑAS	70	2.50	FCO. ARCILLOSO	0	NACIMIENTO	DIRECTIVA COMUNAL	GONZALO DIAZ, MANUEL GUEVARA, JUAN FUENTES
CAS. EL GUINEO, CANTON SAN MATIAS	SENSUNTEPEQUE	CABAÑAS	50	2.00	ARENOSO	40	POZOS, QUEBRADA	DIRECTIVA COMUNAL	SERGIO CORTEZ, FRANCISCO COREAS, JOSE COREAS
CAS. CAMALOTE, CANTON SAN LORENZO	SENSUNTEPEQUE	CABAÑAS	45	2.80	ARENOSO	15	POZOS, QUEBRADA	DIRECTIVA COMUNAL	FRANCISCO RAMIREZ, JOSE CORTEZ, JOSE RAMIREZ
CAS. EL TABLON, CANTON SAN MATIAS	SENSUNTEPEQUE	CABAÑAS	70	2.60	ARENOSO	40	POZOS, QUEBRADA	DIRECTIVA COMUNAL	TERESA DE RIVAS, SALVADORA POSTAS, MANUEL CORTEZ
ENCARGADA DEL GUAYABO, CAMP. NO. 2	SENSUNTEPEQUE	CABAÑAS	150	3.50	ARENOSO	40	POZOS, QUEBRADA	DIRECTIVA COMUNAL	JULIO GALDAMEZ, ARMANDO CHAVEZ, JOAQUIN LOPEZ
CAS. EL JCAYOL, CANTON ROJAS	SENSUNTEPEQUE	CABAÑAS	50	2.00	QUEBRADO	40	POZO, RIO	DIRECTIVA AMAS DE CASA	MARIA MENDEZ, PEDRINA VILLANUEVA, CRISTINA PONCE
COLONIA QUINTEROS	SENSUNTEPEQUE	CABAÑAS	60	2.40	QUEBRADO		POZO	DIRECTIVA AMAS DE CASA	MARIA AVILES, ELENA GONZALEZ, ARCADIA BONILLA
CANTON ROJAS	SENSUNTEPEQUE	CABAÑAS	95	5.00	QUEBRADO		RIO	DIRECTIVA PRO MEJOR.	MANUEL GONZALEZ, MIGUEL MENDEZ, JOSE LOPEZ
CAS. MONTECRISTO, CANTON EL RINCON	VILLA DOLORES	CABAÑAS	70	4.00	ARCILLOSO	40	RIO	DIRECTIVA COMUNAL	ERNESTO DIAS, MODESTO QUINTEROS, ERNESTO ALFARO
HACIENDA SAN BRUNO	VILLA DOLORES	CABAÑAS	80	1.00	ARCILLOSO	3	POZO	COOPERATIVA	HERIBERTO ZAVALA, GUADALUPE LOPEZ, FERNANDO QUINTEROS
CAS. SAN FIDEL, CANTON BANADERO	GUACOTECTI	CABAÑAS	100	6.00	QUEBRADO	0	NACIMIENTO	DIRECTIVA COMUNAL	JOSE MEJIA, OFELIA DE ALVAREZ, VIDAL AMAYA
CANTON AGUA ZARCA	GUACOTECTI	CABAÑAS	30	3.00	QUEBRADO	0	NACIMIENTO	DIRECTIVA COMUNAL	JOSE MEJIA, EFRAIN RIVAS, DOMINGO CANAS
CANTON PALACIOS	ILOBASCO	CABAÑAS	100	2.20	ARENOSO	30	POZOS, QUEBRADA	DIRECTIVA COMUNAL	ERUDINO ARGUETA, SALVADOR CASTELLANOS, ANTONIO ECHEVERRIA
CAS. EL CENTRO, CANTON HOYOS	ILOBASCO	CABAÑAS	100	2.00	ARCILLOSO	40	POZO	DIRECTIVA COMUNAL	PEDRO MERCADO, WENCESLAO FLORES, NICOLAS MENDOZA
CAS. SAN ANTONIO, CANTON AGUA ZARCA	ILOBASCO	CABAÑAS	50	2.00	ARCILLOSO	40	RIO	DIRECTIVA COMUNAL	FERNANDO JOVEL, LUCIO ANGEL, ALEJANDRO CUBIAS
CAS. SANTA LUCIA, CANTON NAQUILIHUAT	ILOBASCO	CABAÑAS	300	2.50	ARCILLOSO	40	POZO	ADESCO	ERNESTO VELASCO, ANGEL MEJIA, MARCOS MARTINEZ
CAS. POTRERILLOS, C/SAN FCO. IRAHETA	ILOBASCO	CABAÑAS	150	2.50	ARENOSO	50	POZO	DIRECTIVA COMUNAL	SALVADOR VALLADARES, ROGEL ALFARO, LEONIDAS ARIAS
CAS. LA MILAGROSA, CANTON SANTA CRUZ	ILOBASCO	CABAÑAS	200	1.80	ARCILLOSO	30	RIO	DIRECTIVA COMUNAL	MARIO AGUILAR, MARFELINO AYALA, ALIGIO ACEVEDO
CANTON SAN FRANCISCO	SAN ISIDRO	CABAÑAS	100	5.00	ARCILLOSO	20	MANANTIAL	ADESCO	RICARDO ECHEVERRIA, NAPOLEON MORENO, JOSE CARDONA
CANTON LA LOMA	VILLA VICTORIA	CABAÑAS	50	1.00	QUEBRADO	20	QUEBRADA	DIRECTIVA AMAS DE CASA	ANA DIAZ, ALBA CORTEZ, CAROLINA TORRES
CANTON SAN PEDRO	VILLA VICTORIA	CABAÑAS	75	7.00	QUEBRADO	50	RIO	DIRECTIVA PRO MEJOR.	ALBINO ESCALANTE, MAXIMILIANO MEMBRENO, PEDRO CARBALLO
COLONIA MORILLO	USULUTAN	USULUTAN	98	2.00	FCO. ARCILLOSO	40	POZOS, COMPRADA	COMITE PRO MEJORAMIENTO	ROBERTO MARTINEZ, SALVADOR JOYA, MANUEL LINARES
CANTON LA PRESA	USULUTAN	USULUTAN	352	5.00	FCO. ARCILLOSO	15	POZO	COMITE PRO MEJORAMIENTO	NICOLAS BERMUDEZ, MARIO BARRERA, MANUEL ORTIZ
COLONIA EL COCAL	USULUTAN	USULUTAN	225	5.00	FCO. ARCILLOSO	10	POZO	COMITE PRO MEJORAMIENTO	JOSE RODRIGUEZ, ANDREA PALOMO, CLAUDIA ARAUJO
BARRIO EL CALVARIO	CONCEPCION BATRES	USULUTAN	100	1.50	FCO. ARCILLOSO	25	POZO	COMITE PRO MEJORAMIENTO	ALONSO SARAVIA, ALCIDES MORALES, REYNALDO SANCHEZ
EFRAIN QUIN	EFRAYQUIN	USULUTAN	6000	1.00	PLANO	9	NACIMIENTO, RIO	COMITE	ALCALDE, DIRECTOR ESCOLAR, COMANDANTE LOCAL
CASERIO EL MONO, CANTON MAVILLAL	SAN MIGUEL	SAN MIGUEL	140	15.00	FCO. ARCILLOSO	15	POZOS	DIRECTIVA PRO MEJOR.	JOSE JUANO, MARCELINA MANZANARES, FERMIN MEDRANO
CASERIO EL PITO, CANTON CALACATAL	SAN MIGUEL	SAN MIGUEL	450	29.00	POCOSO	95	COMPRADA	DIRECTIVA PRO MEJOR.	RAMIRO APARICIO, ALFREDO GRANADOS, RAUL CONTRERAS
COLONIA EL PALMAR	SAN MIGUEL	SAN MIGUEL	150	1.50	ARCILLOSO	10	POZO	DIRECTIVA PRO MEJOR.	LEONIDAS URQUILLA, MIRIAM ARRIAGA, SAMUEL TURCIOS
CANTON SAN DIEGO	SAN CARLOS	MORAZAN	56	16.00	ARCILLOSO	12	RIO, POZO	DIRECTIVA PRO MEJOR.	FELIPE FUENTES, CRISTOBAL GONZALEZ, TERESA LUNA
CANTON VALLE NUEVO	SAN CARLOS	MORAZAN	75	4.00	ARCILLOSO	12	POZO	DIRECTIVA PRO MEJOR.	ESTANISLAO GOMEZ, ENRIQUE REYES, CAYETANO GONZALEZ
BARRIO LA PAZ	SAN CARLOS	MORAZAN	56	4.00	ARCILLOSO	16	POZO	DIRECTIVA PRO MEJOR.	SUSANA ESCOBAR, TERESA QUINTANILLA, JUANA DE UMANA
CAS. GUALINDO CENTRO, CANTON GUALINDO	LOLOTIQUILLO	MORAZAN	250	2.00	ARCILLOSO	5	POZO	COMITE	DOLORES MOLINA, MATILDE VASQUEZ, ANGELINA PORTILLO
CASERIO LAS MATAS Y LAS CRUCITAS	CHILANGA	MORAZAN	150	5.00	ARCILLOSO	0	NACIMIENTO	COMITE PRO MEJORAMIENTO	JUAN PEREZ, ARNESIO PEREZ, ELIAS PERLA
CANTON EL PEDERNAL	CHILANGA	MORAZAN	300	4.00	ARCILLOSO	0	NACIMIENTO	COMITE PRO MEJORAMIENTO	ALONSO MARQUEZ, PEDRO PEREZ, JOSE FLORES
CANTON LOMA TENDIDA	DIVISADERO	MORAZAN	95	2.00	TALPETATE	12		DIRECTIVA PADRES DE FMA.	CASIMIRO MARTINEZ, ANTONIO COREAS, HECTOR FLORES
CANTON SAN PEDRO RIO SECO	DIVISADERO	MORAZAN	225	3.00	ARCILLOSO	22		DIRECTIVA PRO MEJOR.	JUAN SALMERON, ROBERTO UMAÑA, FCO. HERNANDEZ
CANTON SAN PEDRO CARRIZAL	DIVISADERO	MORAZAN	140	2.50	ARCILLOSO	20	POZO	DIRECTIVA PRO MEJOR.	OSCAR UMAÑA, JOSE CARBALLO, PAZ FLORES
CASERIO LOS ROMERO, CANTON EL TRIUNFO	GOTERA	MORAZAN	125	0.01	ARCILLOSO	0	CAPTACION	DIRECTIVA PRO MEJOR.	EMESIO SANCHEZ, SANTOS SANCHEZ, SANTOS CABALLERO
CANTON AGUA CALIENTE	LA UNION	LA UNION	82	5.00	FCO. ARCILLOSO	7	POZO, NACIMIENTO	DIRECTIVA PRO MEJOR.	JOSE FERNANDEZ, MARIO NOLASCO, FRANCISCO HERNANDEZ
CASERIO LA CINCUYA, CANTON SIRAMA	LA UNION	LA UNION	80	2.00	ARCILLOSO	20	POZO	DIRECTIVA PRO MEJOR.	MANUEL MERINO, IRENE GALEAS, MARIA RODRIGUEZ
[illegible]	LA UNION	LA UNION	40	1.00	ARCILLOSO	20		DIRECTIVA PRO MEJOR.	LINO USEDA, SANTIAGO MARTINEZ, LORENZO ARIAS

DIAGNOSTICO DE NECESIDADES DE AGUA POTABLE EN COMUNIDADES ATENDIDAS POR D I D E C O

COMUNIDAD	MUNICIPIO	DEPARTAMENTO	NO. DE FAMILIAS	AREA KM2	TIPO DE SUELO	NIVEL FREATICO MTS.	ABASTECIMIENTO ACTUAL	ORGANIZACION EXISTENTE	TRES PERSONAS QUE MAS SE INTERESAN POR LA COMUNIDAD
BARRIO EL GUAYABITO, CANTON OLOMEGA	EL CARMEN	LA UNION	220	3.00	ARCILLOSO	28	POZO	DIRECTIVA PRO MEJOR.	OSCAR CAMPOS, HECTOR VELASQUEZ, MARIANO RUBIO
CANTON SAN JOSE	SAN ALEJO	LA UNION	64	3.00	SEMIARCILLOSO	14	RIO	DIRECTIVA PRO MEJOR.	MARGARITA FERMAN, ROBERTO MORALES, DORIS MORALES
CANTON AGUA FRIA	SAN ALEJO	LA UNION	45	4.00	SEMIARCILLOSO	15	POZO	DIRECTIVA PRO MEJOR.	SILVIA CIMTRERAS, ELSI VIERA, MAXIMO FUENTES
CANTON PLAYA EL TAMARINDO	CONCHAGUA	LA UNION	1000		ARENOSO		ACARREADA	DIRECTIVA PRO MEJOR.	ALEXANDER HENRIQUEZ, OSCAR MARTINEZ, ADRIAN MARTINEZ
CAS. BUENAVISTA, LOS CORRALES, C/CIPRES	CONCHAGUA	LA UNION	100		ARCILLOSO	6	CAPTACION	DIRECTIVA	MARCELINO CASTILLO, ANDREA SORTO, ESTEBAN MORALES

1425

Total 539 32

182

ANNEX 3

THE RURAL DRINKING WATER SUPPLY PROGRAMME IN INDIA AND THE DEVELOPMENT OF A DEPENDABLE DEEP-WELL HANDPUMP

Holenarasipur V. Krishnaswamy
General Manager
Richardson & Cruddas (1972) Ltd.
Madras, India
(On behalf of the Government of India)

INTRODUCTION

The U.N. Conference of Human Settlements (HABITAT) held in 1976 recommended that safe water supply and hygienic waste disposal should receive priority from governments and international agencies in order to achieve the target of serving all the population by 1990. These laudable objectives were approved in the U.N. Water Conference held at Mar-del-Plata in March 1977, and the decision was made that 1981-90 would be observed as the "International Drinking Water Supply and Sanitation Decade". These recommendations were later endorsed by the 31st U.N. General Assembly, which met in late 1977. India also signed the resolution seeking to achieve the targets by 1990, namely provision of a minimum level of service and access to safe water supply and sanitation for the people of the country. Accordingly, the Decade Programme in India was launched on April 1, 1981.

At the beginning of the Decade in India, in April 1981, about 77 percent of the urban population and 31 percent of the rural population had been provided with protected drinking water supply facilities. The Government of India has fixed a target to cover 100 percent of the population with protected water supply, both in urban and rural sectors, by March 1991. Meeting this target is expected to benefit new populations of 71.7 million persons in urban areas and about 446 million persons in rural areas.

PROGRAMME FOR DRINKING WATER SUPPLY

The provision of drinking water supply to villages has been given high priority. In order to identify the villages which needed immediate attention, a country-wide survey was conducted in the early 1970s through the initiative of the respective State Governments/Union Territory Administrations. The criteria for identification of such villages prescribed by the Government of India were as follows:

> Villages where no water source existed within a distance of 1.6 kilometres or where water was available at a depth of more than 15 metres (in hilly areas, villages where water sources were available at an elevation difference of more than 100 metres from the habitation);

OR

Villages where the water sources had excessive amounts of salt, iron, fluorides and other toxic elements hazardous to health;

OR

Villages which were exposed to the risk of waterborne diseases, such as cholera, guinea worms, etc.

These villages have been termed as "Problem Villages". Out of about 576,000 villages, about 446,000 villages had some sort of drinking water supply problem in March 1983. During 1983-84, 50,138 villages were provided with problem drinking water. About 42,000 problem villages are expected to be covered during 1984-85.

INDIA MARK II HANDPUMP

History

Supplying safe drinking water to all villages of India is a major national task. The most important contribution made by the Government of India to the rural community, especially the problem villages, in support of the drinking water supply programme, is the DEPENDABLE, TROUBLE-FREE, DEEP-WELL HANDPUMP. The critical aspect is ensuring a durable trouble-free service and easy-to-repair handpump--the most vulnerable part of the maintenance system.

For many years, all State Governments have been drilling borewells and fitting them with cast-iron handpumps of traditional design. These pumps could not withstand daily use by several villagers. There were frequent breakdowns, ranging as high as 80 percent at any one time. The following were the major disadvantages in the cast-iron pumps.

The pump design involved many linkages, which increased breakdown rates and the cost of spare parts. Certain spare parts and the body of the pump were made of cast iron and could not be easily reconditioned. The pumps were very heavy and prone to crack while in transit. The flange-to-flange bottom arrangement did not serve with rigidity over a period of time. The pipes were jointed directly to the body through a nipple and a reducer, and this arrangement was not providing prolonged service. When the threads in the body wore out, the body ceased to function. When the spout was damaged, repairs involved drilling and tapping. The handle was not sturdy, which lessened the mechanical advantage. Replacements were frequently made. In these traditional pumps, the components were not well-defined; therefore, there was no interchangeability of components. Because of low mechanical advantage and lighter construction, great effort was required for operation of the pump.

Development

In 1976, Richardson & Cruddas (1972) Ltd., (A Government of India Undertaking), in close cooperation with UNICEF and MERADO (A Government of India Search Unit), developed a fabricated handpump for deep-well purposes, after extensive research in various parts and field trials. Extensive field trials were carried out during the development of an acceptable cylinder.

What emerged was a top-quality standard pump which is today universally known as INDIA MARK II DEEP-WELL HANDPUMP (Figure 1). Today it is one of the most proven and cost-effective deep-well handpumps in the world.

After the field trials of 1,000 Mark II Pumps during 1977-78, it was very clear that the pump was highly reliable and easy to operate and maintain. The frequency of breakdown was less than 10 percent as compared to over 80 percent in traditional pumps. The pump body is fabricated from steel plates--this means a lighter body with high-strength properties as compared to a cast-iron body. The pumphead is hot-dip galvanised to make the body rust-free for years. The mechanical advantage is increased to 8:1, and the use of a heavy-weight handle (instead of a steel pipe) makes the operation very easy. Even children of 6 years-of-age are able to operate this pump with ease. The weight of the handle compensates for the weight of the eight connecting rods (24 metres in length). This considerably reduces the effort required for operation. The pump has only one pivot, thereby reducing the number of spare parts required for servicing. The maintenance cost of the pump comes to below 40 U.S. Dollars per annum as opposed to 100 U.S. Dollars for the traditional pump. The base is firmly grouted in cement concrete which provides rigidity.

Standardisation

The Central Public Health and Environmental Engineering Organisation (CPHEEO), the technical wing of the Ministry of Works and Housing, Government of India, took the initiative in 1977 to formulate Indian Standards for the Mark II Deep-well Handpump with the objective of standardizing the pump in India. Indian Standard Institution (ISI) brought out the specification in 1979. The specification gave detailed designs of components, schemes of inspection, samplings and criteria for acceptance of the pump. This standard is being reviewed every year with changes incorporated wherever necessary to improve the performance of the pump. The ISI specification, viz IS.9301-1979, was revised in 1982 and again is undergoing revision. The design is not patented by any firm; therefore, any organisation can manufacture these quality pumps. As the pump is well-defined through drawings of all parts and standardisation, the purchaser knows very well what is being purchased; inspection of the pump also has become easier. All the State Governments in India have accepted this pump for their programmes, and India now has one India Mark II Deep-well Handpump for all of their programmes. Over 440,000 pumps have already been installed in India, and this figure is likely to reach 800,000 by 1990, including old model pumps being replaced under the rejuvenation scheme. In order to maintain the quality of pumps, independent agencies are rigidly inspecting the pumps at the manufacturers' works before dispatch. On the initiative of CPHEEO, the Indian Standards Institution is now preparing a standard for installation and maintenance of this pump.

Further Development

India Mark II Handpumps can be modified for shallow-well applications as well as extra deep-well applications. The development by Richardson & Cruddas in this particular field is noteworthy. The pump has been modified by R & C for extra deep-well purposes to draw water from 100 metres. These pumps have been supplied to meet the conditions in the Sokoto State of Nigeria. These are perhaps the pumps with the deepest application in the world today.

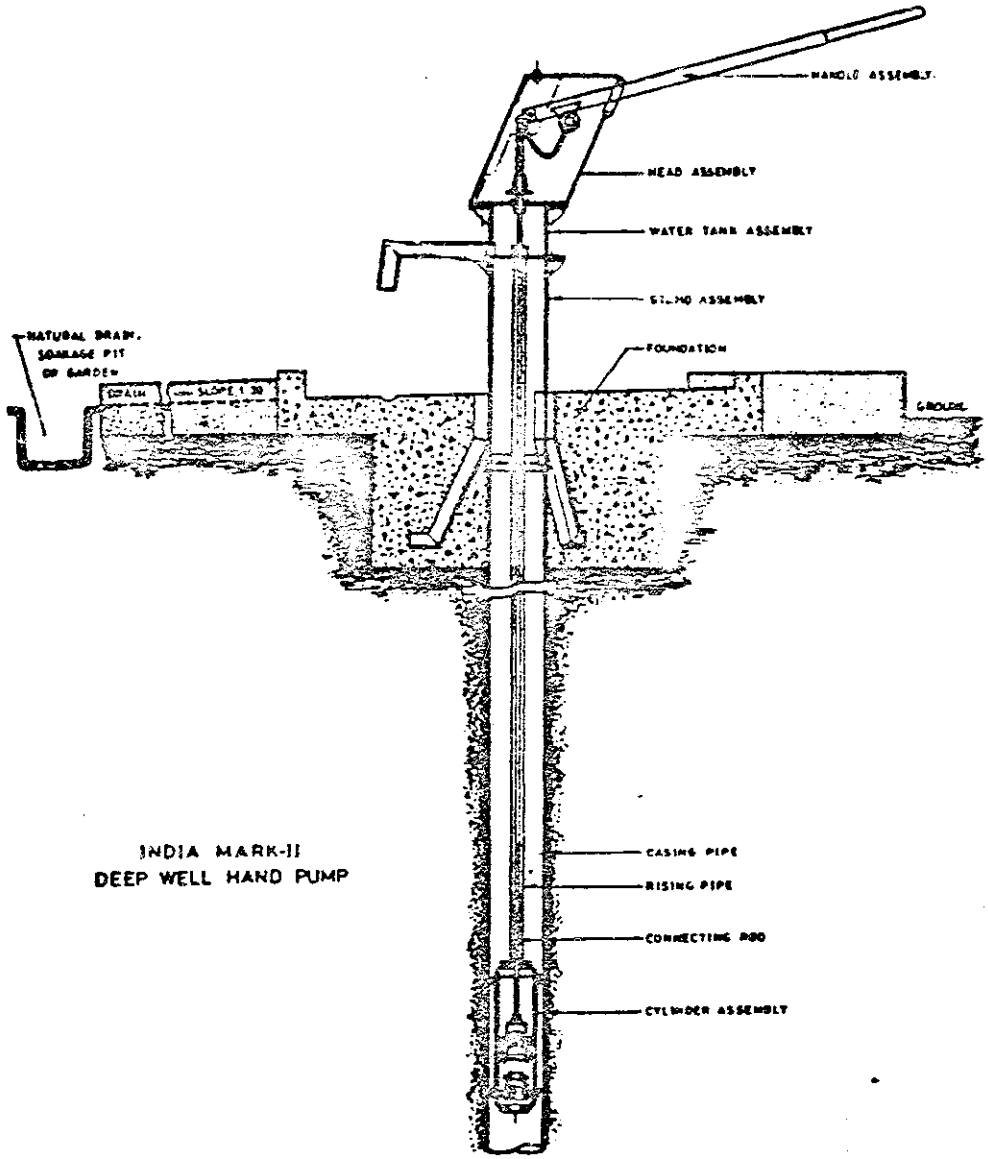
HANDLE ASSEMBLY
HEAD ASSEMBLY
WATER TANK ASSEMBLY
STAND ASSEMBLY
FOUNDATION
NATURAL DRAIN, SOAKAGE PIT OR GARDEN
DRAIN
SLOPE 1 IN 30
GROUND
CASING PIPE
RISING PIPE
CONNECTING ROD
CYLINDER ASSEMBLY
INDIA MARK-II
DEEP WELL HAND PUMP

FIGURE 1

Shallow-well application has been well-received for drawing water from depths of 8 to 10 metres.

Further development work on this pump, in close cooperation with UNICEF and the World Bank, is taking place in Tamil Nadu, and various concepts are being tested in field trials. The objectives of further development work is to make this pump freely and truly a village-level operation and maintenance (VLOM) pump.

Special Tools

Special tools have been developed by Richardson & Cruddas (1972) Ltd. for installation and maintenance of India Mark II Pumps. This is a revolutionary development in that these tools make the installation and maintenance of the pump much simpler. No crane/hoist is required for installation of this pump. The pump for a 30-metre depth can be installed in just an hour with the help of three workers.

Quality Control

The fabricated handpump is a simple design requiring very accurate construction. The pump is subjected to an average of nearly 14 million strokes per year. It is therefore necessary and essential that the entire process from raw material supply and production of parts and sub-assemblies to final assembly is subjected to continual quality control preceded by quality assurance. As the handpump forms a very important part of rural/suburban water supply schemes, the purchasing agency must make sure that the manufacturer has strict 'internal quality control' systems covering the following check points:

(a) Check of incoming parts;

(b) Stage control check of components and sub-assemblies, including welding;

(c) Sub-assembly clearance for surface treatment;

(d) Sub-assembly clearance after surface treatments but before assembly;

(e) In-line assembly inspection and testing.

In addition, the purchaser must ascertain the following availabilities at the manufacturer's premises:

(a) Jigs and fixtures for locating the following assemblies:

Conversion head—guide bushing in relation to flange; flange, side plates, and back plates in relation to each other; left and right bushings with reference to guide bushing; handle window frame; front, bottom and side plates.

Water tank—Pipe coupler on the water tank bottom flange; spout pipe, bottom flange, tank pipe and top flange in relation to each other; gusset-locating fixture.

Handle assembly--Square bar, bearing housing and roller-chain guide; support plates.

Stand assembly--Flange in relation to stand pipe; collar and legs in relation to stand pipe and flange gussets.

Chain assembly - Location of roller chain and chain coupler in relation to each other.

(b) All necessary slip gauges, ring and plug gauges, micrometer, elcometer, shore hardness tester, etc. (basic needs).

The workmanship and finish should be checked with particular emphasis on welding, mating of flanges, minimum distortion, required clearances, thickness and quality of galvanising, lineability, interchangeability, etc.

The manufacturer must also have a well-defined internal inspection procedure which should be verifiable with the help of records, formats, forms showing accepted and rejected parts and disposal of rejected parts, test certificates for physical and chemical properties, etc.

Finally, in addition to the quality control exercised by the manufacturer, inspection by the purchaser is necessary to ensure that the goods comply with the contract specification, that the manufacturing processes have been properly carried out and that the goods are properly packed for dispatch. The better the control exercised by the firm, the less stringent the need be for inspection instituted by the purchaser.

The whole exercise of quality control and inspection by the purchaser should be viewed with the ultimate aim of receiving defect-free, easily installed handpumps to provide a continuous supply of drinking water to the people in the remote and inaccessible problem villages, where the problem of maintenance should be minimal.

THE MAINTENANCE SYSTEM

It is not enough for the technology of the pump to be designed well; equally important for the efficient working of a handpump is the installation and maintenance system. The operational performance of the handpump forms the basis for community acceptance of the programme as a whole. The effectiveness of the maintenance system in turn directly affects the life and performance of the handpump and influences operational maintenance costs.

Continuous usage of the pump subjects it to wear and tear. There is also a correlation between the quality of platform construction/materials used and the frequency of breakdowns. It is therefore essential that members of the maintenance system carry out the following responsibilities:

(a) Obtain prompt information about failure of pumps with the least possible communication gap;

(b) Keep the surrounding platform clean and ensure the proper usage of the pump;

(c) Regularly apply grease on the chain and tighten the bolts and nuts;

(d) Examine the above-ground mechanism every month and carry out repairs as necessary;

(e) Undertake repairs of underground mechanism/major repairs of above-ground parts, within reasonable time, on receipt of "Failure Reports".

The above points are effectively achieved in India by the adoption of what is generally known as the "Three-tier Maintenance System". The structure of this system provides for

- One village handpump caretaker for every pump;

- One 'block' level mechanic for no more than 50 pumps;

- One district-level mobile maintenance team covering 500 installations.

The functions of the above tiers are as follows:

The village caretaker is responsible for keeping the handpump site dry and clean; for servicing the handpumps once a week, including tightening the bolts and nuts and applying grease on chain assembly; for channeling excess water into a garden or soak pit; for explaining and demonstrating the correct method of handpump operation to users of the pump; and for reporting promptly all handpump breakdowns to the District Engineer. He reports by mailing pre-printed, prestamped and pre-addressed "Handpump Failure" Postcards on which he only makes a tick mark against the appropriate space mentioning the specific type of failure. The Caretaker is selected from educated volunteers in the village. Caretakers are very important persons in the Maintenance System, because if they conscientiously and regularly perform their duties and responsibilities, they significantly contribute towards providing people with a continuous source of safe, clean, drinking water.

A "Block" Level Mechanic with tools and a bicycle visits on a regular basis, usually once a month, all the handpumps in his jurisdiction. He can carry out minor repairs that arise in the pumphead, but cannot deal with the problems of the below-ground mechanisms. He informs the District Engineer whenever a major repair is anticipated or needed.

The District-Level Mobile Team, a key element in the modernized Handpump Maintenance System, consists of four men (a Junior Engineer, a Senior Mechanic, a Mechanic-cum-Driver, and a Fitter), equipped with a diesel pick-up truck and a small workshop at the District Office. Each team is expected to carry out both preventive and corrective maintenance of both above-ground and below-ground mechanisms.

The above system is continuously reviewed and updated. The cost of maintenance is met by the State Governments.

COST FACTORS

(a) A complete India Mark II Deep-well Handpump including cylinder and connecting rod of 30 metres, costs 150 U.S. Dollars.

(b) The estimated annual recurring cost per pump is about 40 U.S. Dollars, which includes spare parts and cash costs of the mobile team. This is nearly 40 percent of the annual maintenance cost of the other types of pumps, such as cast-iron double guide, Jalna, etc.

CONCLUSION

No doubt the development of the India Mark II Deep-well Handpump was a big stride in providing safe and assured water for the rural population as well as fringe portions of the urban population. The search for a bigger stride continues. The World Bank has embarked in India on a project to further improve the below-ground mechanism of the India Mark II Deep-well Handpump, involving UNICEF, RICHARDSON & CRUDDAS, WAVIN INDIA, and the Government of the Tamil Nadu State. In the present form of the pump, the riser main is lifted along with the cylinder body and the connecting rod, to carry out any repair required in the plunger assembly and check valve assembly of the cylinder. At present, only the replacement of the cupwasher, which accounts for 75 percent of the repairs in the cylinder components, calls for the removal of all the above-mentioned parts. The object of the new experiment is to find a way of retaining the cylinder body and rising main, but lifting the connecting rods with the lower and upper valve assemblies only. This will greatly reduce the cost of maintenance and improve the mobility of maintenance teams, as they do not have to carry heavy tools. This will also reduce the downtime of the pump. The field trials of the modified below-ground mechanism is being carried out. If this venture becomes successful, the entire maintenance scheme will go through revolutionary change.

ANNEX 4

COMMUNITY FACT SHEET

Name of Community:

Department:

Location:

Number of Families:

Description of Terrain:

Access:

A. Information on Existing Community Structure.

Is there a Comite Pro-mejoramiento? Yes ___ No ___

Names of members: _____
_____
_____
_____
_____

Is there a Comite Pro-agua? Yes ___ No ___

Names of members and titles: _____
_____
_____
_____
_____

B. Information on Current Water/Sanitation Conditions.

Where are people currently getting water?

_____
_____
_____
_____

Approximately how much time daily is spent by households on obtaining water?

_____

Percentage of households with latrines:

_____

Is community within priority area identified by Ministry of Health?

____ Yes ____ No

C. Information on Other Development Workers in the Area:

	(name)	(location)
Health Worker -	_____	_____
Primary Teacher	_____	_____
Ag worker	_____	_____
DIDECO promotor	_____	_____
Others	_____	_____
	_____	_____
	_____	_____

D. Summary of Technical Survey:

Availibility of water:

Distance of source to community:

Is access to community with drilling equipment possible?

SUMMARY:

Date request received	_____	through	_____
Date of initial visit	_____	by	_____
Date of subsequent visits	_____		_____
	_____		_____
	_____		_____
	_____		_____
	_____		_____
	_____		_____
	_____		_____
	_____		_____
	_____		_____

Rating of need for services:
____ Critical
____ Average
____ Not Critical

Latrine program needed:
____ Yes
____ No

Date Services Provided: _____

100

ANNEX 5

CONVENIO PARA LA IMPLEMENTACION DEL PROGRAMA DE AGUA Y SANEAMIENTO COMUNITARIO

La Administracion Nacional de Acueductos y Alcantarillados (ANDA) y la Directiva Pro Agua y Saneamiento Comunitario de Hacienda Santa Barbara
Municipio El Paraiso
Departamento Chalatenango
Acuerdan:

La Primera (ANDA), administrar la construcción de tres (3) pozo(s), la instalación de tres (3) bomba(s) manuales.
Para realizar esta labor (ANDA) se compromete a:
1. Elaborar los documentos necesarios para la contratación de las empresas que supervisaran y/o construiran las obras mencionadas.
2. Administrar los contratos y velar por la ejecución de las obras.
3. Tomar muestras de los pozos construidos bajo este convenio mensualmente y efectuar pruebas para la detección de coliformes en su Laboratorio.

La Segunda (la Comunidad), administrar las obras construidas bajo este convenio de tal manera que le garantice a los habitantes de la comunidad el servicio y la utilidad de dichas obras. Para la administración la Comunidad se compromete a:

1) Elejir una Directiva Pro-Agua y Saneamiento Comuntario de por lo menos tres personas, miembros de la comunidad, quienes firmarán el Acta de Recepción de las Obras, informarán a ANDA y velarán por la construcción de las obras recibidas bajo este convenio. En el caso que el convenio se suscriba

.../

con una municipalidad la Directiva será electa por los miembros del Concejo Municipal.

2) Constituir y administrar un Fondo para el Agua y el Saneamiento Comunitario con el aporte de los habitantes de la Comunidad Beneficiada por las obras construidas. Cada núcleo familiar contribuiráun mínimo de cinco colones (¢5.oo), pudiendo la comunidad imponer una cuota más alta si fuera necesario. El fondo será utilizado para:

a - Pagar a una persona que de mantenimiento y cuide las bombas y los pozos, asegurando así el buen uso del equipo y la buena calidad del agua producida.

b - Comprar los repuestos que fueren necesarios para la reparación de las bombas manuales instaladas bajo este convenio.

c - Reposición parcial o total del equipo de bombeo instalado.

3) En este mismo Acto se hace entrega formal de la obra antes descrita, quedando como únicos responsables por negligencia ó mal uso de los equipos la Comunidad.

De conformidad firman ambas partes en cinco ejemplares de un mismo tenor y a un solo acto en Hda. Sta. Barbara a los diecinueve días del mes de Noviembre de mil novecientos ochenta y siete.-

.../

FORM. 1

102

POR LA ADMINISTRACION
NACIONAL DE ACUEDUCTOS
Y ALCANTARILLADOS

POR LA DIRECTIVA DE AGUA
Y SANEAMIENTO COMUNITARIO

VICTOR MANUEL LEMUS
PRESIDENTE

JULIO A. LANDAVE
TESORERO

LUIS VINICIO BELTRAN
SECRETARIO

ANNEX 6

SUGGESTED JOB DESCRIPTIONS

ANDA Promoter

community organization:

- establishes a functional water committee that represents the entire community and includes at least one woman.
- assists the community establish an appropriate user fee system and mechanisms for fee collection, accounting procedures and financial review.
- facilitates appropriate site selection within the community for handpumps.
- helps to resolve conflicts among community members over water issues.
- facilitates community participation in building the system.

health education:

- identifies development workers in the community who can assist in health education efforts and supports and provides feedback to those workers.
- assures that the local health worker has adequate supplies to treat simple water-related diseases (especially ORT packets) and that water-related diseases are identified and treated, or referred to appropriate health facility.
- establishes and liaises with the area health education committee to assure that health education activities are being conducted at the community level, that proper support and feedback is being provided and that adequate resources are available for project activities.

At mid -level: (i.e. regional or departmental MOE, MOH, MOA)

- coordinates and supervises health education activities at the local level,
  (or at minimum, accepts and supports role of community worker in health education re: water and sanitation issues activities, i.e. legitimate task of worker).
- provides technical assistance in health education and water-related matters.
- (possibly disburses necessary funds for education and support activities at the local level).

At the community level:

health worker (ACS, ARS or enfermera):

- identifies and treats or refers water-related diseases.
- conducts group health education activities.
- assures that adequate hygiene conditions are maintained at handpump site.

primary school teacher:

- using innovative educational methods, conducts regular health education activities with students
- assures that students use proper hygiene habits while in school
- assures that school latrine is maintained properly

educadoras del hogar

- conducts group health education activities re water.

ANNEX 7

Scope of Work

El Salvador: PP Amendment

Background

USAID/El Salvador has requested WASH assistance in evaluating a pilot program and developing inputs for a Project Paper (PP) amendment for the Potable Water and Environmental Support Component of the Public Services Restoration Project. The AID mission used recommendations from a previous WASH consultancy in February 1986 in developing a concept paper for a proposed project. A pilot project based on the concept paper has been underway for approximately one year, funded with ESF local currency generations. The National Adminstration for Water and Sewage (ANDA) has created a project implementation unit for the management of the pilot program. $5.6 million equivalent was allocated in CY 1987 for the desegn, supervision and construction of 13 small water systems and for the drilling of 218 wells and installation of handpumps. In addition 400 Mark II handpumps have been purchased, 8 drilling rigs are in the country, and 2 are expected to arrive in mid February 1988.

USAID/ES is considering an extension of the pilot activities within project 0279 over a two-year period starting in FY 1989. In order to proceed with a project amendment design and related documentation, USAID/ES requires an evaluation of the pilot program, including recommendations for any changes; in-depth analysis of institutional relationships; development of training and evaluation programs; and preparation of social, economic and environmental impact statements.

The proposed activity is expected to include:

A. Existing water and sewage systems repair and upgrading.

B. Design, supervision and construction of small water and sewage systems for smaller urban and rural areas.

C. Well drilling and handpump installation for small rural communities where small water systems are not feasible.

D. Community organization for a capital recovery function, well and handpump caretaking, and water and environmental instruction and information transfer.

E. Small regional water analysis laboratories and repair shops.

F. Training of institutional and community personnel required for water testing; equipment installation, operation and maintenance; and water use and health education.

Responsibilities

I. Objective

To evaluate the pilot water/wastewater activity and establish the feasibility of the program.

II. Specific Tasks

A. Review the following documents, and others as appropriate:

1. WASH report No. 187, "Preliminary Design for Handpump Installation Project in El Salvador."

2. USAID/El Salvador concept paper, " Domestic Water Project."

3. The conclusions of the mission management retreat held on October 15-17, 1987.

4. The USAID action plan for FY 88-89.

5. The USAID/El Salvador FY 1989 congressional presentation.

6. AID policy paper - Domestic water and sanitation (1982).

B. Review previous relevant studies prepared by WASH. The team is expected to have a working knowledge of WASH experience as reflected in its field reports No. 187 and 209.

C. Evaluate the USAID/El Salvador-assisted pilot domestic water activity with respect to the following:

1. extent of community participation
2. need for and extent of health education activities
3. areas in which costs can be recovered from users
4. effectiveness of training and additional training needs
5. effectiveness of operations and maintenance
6. institutional relationships
7. technical assessment.

D. Meet with and solicit opinion from the following offices and agencies:

1. USAID/El Salvador:
   Office directors (HPN, IRD and PRJ)
   Mission Management

2. GOES:
   Ministry of Planning
   ANDA (GOES Water Authority)
   Ministry of Health

3. Other donors:
   IDB San Salvador office

E. Develop outlines and training programs for maintenance, water source development, and environmental sanitation.

The Final Report

The report shall be written in English and structured and organized so that its components can be used in the project paper amendments standard study areas. Accordingly, the report shall contain, but be not necessarily limited to, the following sections, and shall follow the instructions in AID handbook 3.

A. Technical analysis, including statement of the perceived problem; statement of activity goal and purpose; expected achievements and accomplishments; and outline of the activity, and comments/recommendations on suitability of nature, extent and budget for activities.

B. Economic analysis, including cost-effectiveness based on pilot activities and development of cost-benefit data for full program activities (to be done by USAID mission).

C. Financial analysis of activities designated to be financed in whole or in part by user fees, and recommendations on financing other activities with user fees.

D. Institutional analysis, including GOES and AID offices and agencies. Identify all technical assistance audiences and recipients, and analysis and impact of other donor participation.

E. Estimated costs and methods of funding.

F. Logical framework.

Logistic Support

All support services are the responsibility of the WASH project.

Deliverables

A. Within five (5) working days of arrival the consultant will provide to USAID a work plan which will include:

1. Proposed interviews with GOES officials.

2. Listing of any additional USAID and GOES documentation required.

3. Schedule of work showing proposed delivery date of draft report.

B. Within ten (10) days of arrival, the consultant will submit to USAID a detailed annotated outline of the final report for review and discussion.

C. At least one week prior to the completion date, the consultant will provide a draft of the report to the USAID for review and comment. The contractor will be present during the mission review and will incorporate any corrections or changes into the draft final report.

Relationships

The contractor shall report to the IRD office director, or his designee. The GOES liaison officials will be designated upon arrival of the contractor to El Salvador.

Timing

The field work will be carried out 2-28 May. The team planning meeting will take place 28-29 April at WASH.

Personnel

The assignment will be carried out by a three-person team:

- Project Design Specialist/Team Leader
- Engineer
- Health Educator