

AGUA DEL PUEBLO
RURAL POTABLE WATER AND LATRINE
METHODOLOGY DEVELOPMENT PROJECT



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agua
del pueblo

SEPTEMBER 14, 1976

PROJECT TITLE: AGUA DEL PUEBLO RURAL POTABLE WATER AND
LATRINE METHODOLOGY DEVELOPMENT PROJECT

TOTAL OPG REQUEST: \$ 24,000.

PROJECT LOCATION: Guatemala City

PVO NAME AND LOCATION: AGUA DEL PUEBLO
Santa Cruz del Quiché
Guatemala

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TABLE OF CONTENTS

	<u>PAGE NO</u>
PVO DESCRIPTION	1
I. PROJECT PURPOSE AND DESCRIPTION	1
A. Project Purpose	1
B. General Description of Project	2
C. Project Background	3
1. Elements and Development of the Field-Tested Methodology	3
2. New Elements of the Methodology	7
a. Self-financing for Construction Materials	7
b. Rural Water Technicians	9
D. Statement of Project Relationship to Other Consideration of PVO Funding	11
II. IMPLEMENTATION PLAN	13
A. Development of Methodology for Self-Financing	14
1. Determination of Potential Funding Sources	14
2. Determination of the ability of villages to pay back loans	15
B. Development of Methodology for Rural Water Technician (T.A.R.) Training Program	16
C. Development of Methodology for Rural Water Technician (T.A.R.) Utilization	19
D. Integration of All Aspects of Methodology and Promotion of Its Application	20
E. Time and Cost Inputs for Each Aspect of the Methodology Development	21

TABLE OF CONTENTS

	<u>PAGE NO.</u>
III. FINANCIAL PLAN	22
A. A.I.D.	22
B. Agua del Pueblo	23
C. Agua del Pueblo Project Preparation Costs	23

APPENDIXES

	<u>PAGE NO.</u>
APPENDIX A: BENEFITS OF RURAL POTABLE WATER SYSTEMS	25
I. PUBLIC HEALTH BENEFITS	25
II. PRODUCTIVITY BENEFITS	27
III. IMPROVEMENTS IN VILLAGE INSTITUTIONS AND FURTHER COMMUNITY DEVELOPMENT	28
IV. IMPROVING THE ROLE AND STATUS OF WOMEN IN RURAL COMMUNITIES	29
V. FIRE PROTECTION	31
APPENDIX B: SELECTION CRITERIA FOR RURAL WATER TECHNICIAN TRAINEES	32
APPENDIX C: CONSULTING FEE SCHEDULE AND COMMENTS	33
APPENDIX D: AGUA DEL PUEBLO FIELD-TESTED METHODOLOGY	34

PVO DESCRIPTION

Agua del Pueblo (ADP) is a non-profit institution incorporated in the state of Missouri, U.S.A. (because Missouri law would not accept a name in Spanish, Agua del Pueblo is incorporated as The People's Consultants). As a technical assistance institution ADP has worked since 1972 in small rural highland villages of Guatemala, Central America. While ADP has been involved in a variety of technical assistance projects, our efforts have been concentrated on potable water systems for small villages.

I. PROJECT PURPOSE AND DESCRIPTION

A. Project Purpose

The purpose of this project is to develop a complete methodology for a rural potable water supply and latrine construction program, and to prepare for the field testing of that methodology. Also, a methodology is to be developed for the training and utilization of Rural Water Technicians.

The methodology, once complete, would constitute an effective way of employing resources to most efficiently serve the potable water and excreta disposal needs of Guatemala's rural inhabitants. This methodology would be made available to all interested groups.

Application of the methodology, either by public or private institutions, would benefit the poor rural majority in Guatemala by

improving their living conditions, their economic potential, and by acting as a catalyst for further community development projects. It is hoped that the GOG, AID, and ADP will later jointly participate in the application of the methodology in a demonstration project.

B. General Description of Project

Through over four years of experience in Guatemala, ADP has developed the framework of a methodology that is an effective way of tackling the rural potable water and escreta disposal problem. Many elements of this methodology have been field-tested through ADP's projects. (Refer to Appendix D).

ADP feels it important to further develop its methodology to include other important elements, including an improved approach to financing of projects, and utilization of Rural Water Technicians. These new elements, however, remain to be tested, because there is no sufficient analysis of their viability in the Guatemalan institutional context. Thus, the methodology is incomplete until such analysis is executed.

In this project ADP will analyze and develop two innovations in order to close these analytic gaps and complete the methodology. The first innovation involves the financing of rural water systems and latrines for small communities which are poor. As a partial solution to the present resource gap ADP is suggesting a greater reliance on

village self-financing. Under this facet of the methodology, the participating villages would be required to pay for, through a loan, the major portion of the costs for construction materials for their water systems and latrines. The proposed project would analyze the availability of financial sources willing to make such a loan, the ability of the villages to be responsible for the loan, and the whole procedure for loan payments and collection. Initial discussions with possible financial sources have been encouraging.

The second innovation involves the technical requirements for design, construction, and maintenance of rural potable water systems and latrines for small communities. As a solution to the present technical gap in the rural potable water field, ADP is suggesting a training program for Rural Water Technicians (hereafter referred to as T.A.R., which stands for the Spanish "Técnico de Agua Rural"). Under this training program, rural persons would learn to plan, design, construct, and maintain such systems. The proposed project will analyze the economic justification for the T.A.R. position; the acceptability of the T.A.R. position within the Guatemalan institutional context; the availability of Guatemalan institutions willing to participate in the training of the T.A.R.; and the curriculum design.

C. Project Background

1. Elements and Development of the Field-Tested Methodology

Since 1972, ADP has worked in rural Guatemala on a variety

of technical assistance projects, including construction of schools, a clinic, a bridge, and a small hydroelectric plant for a rural hospital. Our expertise, however, is found in the rural potable water and latrine field.

In line with a commitment to a self-help development philosophy, ADP has been formulating the general outlines of a working methodology for the introduction of rural potable water systems. From our independent experience in building six water systems serving over 5,000 people, and from our present work (as contract employees of CARE) on a major regional potable water program in El Quiché, ADP has successfully field-tested major elements of the methodology.

ADP's field-tested methodology requires maximum village participation during all stages of the water projects: Planning, design, construction, education and maintenance. The village is ultimately responsible for deciding, with ADP technical guidance, the nature of the water supply system to be built. With that decision made, design and budget are finalized, and the village itself, under ADP supervision, constructs the water system. By donating their labor and locally available materials, the villages directly shoulder a major cost of the water system, and thereby reduce the need for external financial support.

Another major element of ADP's field-tested methodology is a commitment to having technicians in the field maintaining close

contact with the rural environment. By locating our offices in the rural area and by recruiting rural Guatemalans for our staff, ADP is in the position to see that its technicians spend considerable time in the field doing on-the-site work, and are close at hand when problems arise. Inputs from the rural environment, picked up through ADP field presence, are closely coordinated by means of a team approach ADP uses for every project. In this way, every team member gains from the knowledge of every other member, and every member is in close contact with the actual field work.

The effect of requiring a major village contribution and of having technicians in the field is a greater sensitivity to local desires, and greater sensitivity to socio-cultural factors that cannot be ignored for any successful project. As part of our field-tested methodology, therefore, ADP has developed a sensitive, yet firmly structured approach to the relationship between the village and the technical assistance institution. Clearly delineating the responsibilities of each party, this element of the methodology assures minimum misunderstanding and maximum cooperation between the village and the technical assistance institution. (See Appendix D).

To maintain such a high level of village participation and communication, ADP insists on working through a village committee, elected by the village members and meeting the legal requirements to collect mutually-agreed upon fees and oversee village projects. Furthermore, contact with the village is supervised by a Guatemalan

social worker, rural health technician, or promoter who is intimately familiar with the particular community. The committee, working with the guidance of the social worker, organizes the necessary village inputs, both decision-making and physical inputs, to the water system and latrine construction project.

One can summarize some of the more notable elements of the field-tested methodology as follows. Such elements include maximum community involvement in the execution of water system and latrine construction, coordination with health education programs such as that implemented by the Rural Health Technicians of the Ministry of Public Health, use of volunteer labor for all unskilled work, labor intensive construction techniques, creation and utilization of locally elected village water committees to oversee the village input, feasibility studies at the earliest possible stage, and use of regional field offices. Also included in the field-tested methodology is a process by which the village moves through programmed stages, including an early stage when it is decided whether or not it will be included in the program, followed by stages for education and organization of the community while engineering design work proceeds, and continuing into the construction and completion stages. (See Appendix D). A detailed site selection and survey has also been developed.

Taken together, these elements of ADP's methodology have promoted the success of our work in rural Guatemala. The success,

however, has been limited by several structural constraints presently found in the rural potable water field. In this sense ADP's methodology is incomplete. The proposed project will analyze the means by which these constraints are overcome, and will thereby formulate an integrated methodology that can be practically applied.

2. New Elements of the Methodology

a. Self-financing for Construction Materials

The current small rural potable water system picture in Guatemala is characterized by several fundamental problems or constraints. There is universal agreement that present efforts by public and private institutions to solve the rural potable water problem, though considerable, are nevertheless inadequate. While the reasons for this are complex, at least two important constraints involve financial and technical resources.

ADP's own experience in the small rural potable water field has brought it face-to-face with these two constraints. The financing of small rural water systems has consistently been an obstacle to the expansion of ADP's work, and ADP experience is not unique. The long list of villages that have been waiting up to ten years for government institutions to finance their water systems attest to the scarcity of government resources for rural water systems.

By keeping ADP technical overhead costs to a minimum, and by requiring villages to contribute labor and locally-available materials, ADP has been able to reduce the dollar costs of a water system. Even with this cost reduction, however, it has been very difficult for the villages to locate construction funds. Funds from central or local government budgets or from foreign assistance groups have been insecure and inadequate.

For this reason, ADP has formulated a new element of its methodology: village self-financing. The idea is that villages will not only shoulder the labor costs and supply locally-available materials, but also the villages will be required to pay for the other material costs with the help of a loan. A recent authoritative World Bank paper argues that,

villages should ... be required to pay as much as they can of the costs of constructing and operating their systems ... A number of strong reasons exist for requiring payment by villages toward construction and recurrent costs:

- * It is desirable that beneficiaries should contribute toward the cost of services received.
- * It makes more funds available to the program, and by reducing the use of government funds to meet recurrent costs, allows more to be spent on extending new systems to other rural areas.
- * It will help ensure that funds are available to meet operating expenses and the cost of minor repairs.
- * It instills a sense of responsibility on the part of the villagers for the new system.
- * It will help ensure that the level of service to be provided is appropriate to the needs and desires of the village. (Village Water Supply; A World Bank Paper, March 1976, pp. 10-11).

While we believe the justification for the self-financing concept is strong and that the concept is practical, and while many villages have indicated their interest in such a program to ADP, the feasibility of the concept within the context of Guatemala still needs to be systematically analyzed. Analysis is also needed with regard to the various possible approaches to self-financing, institutional arrangements, credit terms, etc. ADP in the proposed project will carry out such analysis.

b. Rural Water Technicians

A second major problem in the rural potable water field in Guatemala is a technical resources constraint. Through our experience we have noted the extreme lack of qualified technical personnel willing to work in rural areas at a reasonable rate of compensation. Perhaps the very existence of ADP is the best evidence for such a technical resources gap. Although this problem is not limited to Guatemala, it may possibly be more acute here. The World Bank paper identifies as one of the major problems of rural water supply programs the lack of trained manpower. (Village Water Supply: A World Bank Paper, p. 7).

Particularly missing are a sufficient number of engineers who are competent to design and supervise the construction of rural water systems. Although the number of engineers is increasing, the demand for them is increasing even more rapidly. Furthermore, there

are almost no Guatemalan engineers who would be content to live outside Guatemala City. Engineers who work on projects outside of the capital city almost always continue to live in the city, and, consequently, their time in the field is reduced, because of transportation time. As engineers gain experience and seniority they often demand positions which do not require their field presence, and this leaves only an inadequate number of less-experienced engineers to work on rural water systems in the more remote areas.

Experience is critical in this field, much more so than engineering theory, because this is a fairly uncomplicated branch of engineering. Thus an experienced technician with minimal training (perhaps 18 months) might earn half of what an inexperienced young civil engineer does, and still be more productive and more valuable.

In Guatemala there exists a vocational "gap". There are a large number of tradesmen (plumbers, masons, etc.), and a growing number of very highly trained civil engineers. However, there are few people in between these extremes, who could handle simple engineering construction supervision (under the official direction of an engineer), and yet not be so poorly qualified that they would have to demand an engineer's rate of compensation.

The solution to this problem is to take persons who are already content to live in the rural region and who have sufficient technical aptitude (see Appendix B for a discussion of T.A.R. qualifications),

and train them specifically for the job of Rural Water Technician ("Téc-nico de Agua Rural", or T.A.R.). This problem and its solution are ana-logous to the AID/Ministry of Public Health program for training Rural Health Technicians.

A 1975 W.H.O. publication on community water supply in the developing countries calls for "a reorientation of training and uti-lization of manpower to get the job done by personnel with minimal but adequate training." (Community Water Supply and Excreta Disposal Situation in the Developing Countries, W.H.O. Offset Publication No. 15, 1975, p. 34).

This new element of the methodology especially requires fur-ther analysis. Before it can be applied to the rural potable water field extensive analysis must be undertaken to determine the feasibi-lity of the T.A.R. concept in the Guatemalan institutional context.

D. Statement of Project Relationship to other Considerations of PVO Funding

The specific purpose of this project is to develop a method-ology that will demonstrate an effective way to meet one of the pressing needs of the poor majority in Guatemala. The target group is the high-land rural Indian communities which have served previously as the basis for formulation of the methodology and as the locales for field-testing. These Indian highland communities represent one of the lowest and most marginalized income groups in Guatemala.

The methodology to be developed is based specifically on the concept that domestic resources ought to be put to greater use through village self-financing. Further, the rationale for the T.A.R. program is to ensure that benefits from a water program will spread to a larger number of people over an extended period of time through the transfer of technical resources.

As to the general beneficial developmental effect of the introduction of rural potable water systems, it can be argued that they are universally accepted (see Appendix A for specific discussion of the benefits of potable water systems). Particular attention should be paid to the important contribution potable water systems make to improving the role and status of women in rural communities.

Institutions which have already indicated interest in utilizing all or part of the methodology to be developed include U.N.E.P.A.R. (the rural water systems construction division of the Ministry of Public Health), the National Community Development Program, Catholic Relief Services and C.A.R.I.T.A.S., and the Behrhorst Foundation and Clinic.

It is hoped that upon completion of the methodology development proposed in this project, its direct benefits will be demonstrated by actual application of the methodology. It is anticipated that a second larger grant will be solicited from A.I.D. to cover certain of the costs of an integrated Rural Water Systems and Latrine Construction

Program and Rural Water Technician (T.A.R.) Training Program. Although the proposed distribution of inputs may change as the methodology is more fully developed, it is presently anticipated that a grant will be solicited from A.I.D. to cover technical, training, and administrative expenses for a three-year period, beginning in mid or late 1977. Discussions with other P.V.O.'s thus far indicate that they will be able to supply funds to be loaned directly to the communities to cover costs of construction materials, via a revolving fund. Eventually it is intended that the Ministry of Public Health will take over the program.

II. IMPLEMENTATION PLAN

The implementation of the project will take place over a six-month period, from a base of operations in Guatemala City. It will include extensive collection of data, analysis, and a broad spectrum of consultations to analyze all possible sources of the required inputs in the methodology which will be developed, including financial, technical and administrative inputs. Among the purposes of the consultations will be the identification of the most viable sources of these inputs as well as the best methodology to coordinate the inputs that will be utilized. The methodology to be developed will be specific in naming the appropriate institutions which could serve as input sources, and will include assurances that the named institutions are capable and willing to provide such inputs. The various aspects of the methodology will be interrelated, requiring an iterative approach to their development.

The methodology development will involve a variety of tasks that are delineated in the sections below.

A. Development of Methodology for Self-Financing

1. Determination of Potential Funding Sources

In this section we will determine the potential sources of funds for each aspect of the methodology. As stated earlier, although the proposed distribution of inputs may change as the methodology is more fully developed, it is presently anticipated that a grant would be solicited from A.I.D. to cover the first three years of technical, training and administrative expenses. Discussions with other P.V.O.'s, including most notably the Behrhorst Foundation and Clinic, Church World Services, and C.A.R.I.T.A.S, thus far indicate that they would be able to supply funds totalling roughly \$250,000, to be loaned directly to the communities to cover costs of construction materials, via a revolving fund. Still to be ironed-out are the limitations which such P.V.O.'s might place on the use of their funds, including possible limitations on geographical location, size and type of communities, other counterpart groups, and the time frame within which the funds could be utilized.

The following groups will be consulted:

i. The Behrhorst Foundation and Clinic

- consultations will be held in both their New York headquarters and their Guatemalan field offices.

- ii. Catholic Relief Services and C.A.R.I.T.A.S.
 - consultations will be held in Guatemala.
- iii. The Penny Foundation
 - consultations will be held in Guatemala
- iv. Church World Services
 - consultations will be held in the U.S.
- v. Partners of America
 - consultations will be held in Guatemala
- vi. Other Guatemalan-based institutions.
- vii. Other U.S.-based institutions.

2. Determination of the ability of villages to pay back loans

In this section we will determine the pool of villages in a position to repay various types of loans, and determine the most viable loan arrangement. We will analyze possible financial arrangements, including credit terms, degree of supervision required, and collection procedure. Included in this analysis will be determination if our preliminary concept of loaning funds for all materials costs and having technical and administrative costs covered by outside institutions, is viable. Also, arrangements will have to be made with a counterpart institution which is capable of overseeing the collection of loan payments over an extended period of time, such as the Penny Foundation or the Behrhorst Foundation.

a. The following groups will be consulted:

- i. ROCAP (regarding studies of per capita income in Guatemala)
- ii. The National University at San Carlos (regarding their studies of per capita income and related subjects).
- iii. The National Program for Community Development (regarding their experience with revolving funds).
- iv. The Ministry of Public Health (regarding their experience with monthly water payments).
- v. INCAP (regarding their studies of community development).
- vi. The Penny Foundation (regarding their experience with loan repayments).
- vii. The Behrhorst Foundation.

✓ b. Research on previous self-financing projects and related subjects will be carried out in both Guatemala and the U.S.

✓ c. A written report will be produced on the feasibility of village self-financing for water projects in rural Guatemala, including analysis of possible methods of doing so.

B. Development of Methodology for Rural Water Technician (T.A.R.) Training Program

In order to form an optimum training program for the T.A.R.'s,

first an analysis of their tasks and functions will have to be performed. Then a curriculum including classroom and on-the-job experience will have to be developed.

It is anticipated that the Guatemala Academy of Medical, Physical and Natural Sciences will be contracted to design the T.A.R. training program, either partially or completely (it is anticipated that roughly \$1,000 of the consulting fees included in the Financial Plan will go directly to the Academy of Sciences for this purpose). The Academy staff are experts on task analysis, curriculum development, and the methodology of teaching specific subjects. They already have performed a similar study on the training of Rural Health Technicians, which is another A.L.D. funded program with many similarities to the T.A.R. program. Also, the Academy has consulted on many other occasions with INTECAP, which it is anticipated will fill the role of training counterpart in the final methodology. The Academy has already expressed interest in participating in the development of the T.A.R. training program.

1. The following tasks will be performed:
 - a. Arrangements will be made for a Guatemalan counterpart group such as INTECAP, to participate in the training program. The nature and degree of their participation will be determined.
 - b. The potential pool of qualified persons for the positions of T.A.R. trainees will be determined.

- c. A selection and testing procedure for applicants for the T.A.R. trainee positions will be determined (see Appendix B).
 - d. Appropriate training stipends will be determined.
 - e. The curriculum will be developed.
 - f. Training location and costs will be determined.
 - g. Appropriate selection, and training or orientation, for teachers will be determined.
 - h. A procedure for periodic evaluation and testing of the trainees will be developed.
 - i. Arrangements for on-going consultants to the training program will be made.
 - j. Methods and personnel for field supervision will be determined.
 - k. Preliminary plans for on-going refresher courses will be made.
2. The following groups will be consulted:
- a. The Guatemalan Academy of Medical, Physical, and Natural Sciences.
 - b. I.N.T.E.C.A.P. (the Guatemalan Institution for Capability

and Productivity Improvement, which is responsible for adult vocational training).

- c. The Sanitary Engineering Department of the National University of San Carlos.
- d. The Ministry of Public Health.
- e. Guatemalan institutions which might eventually utilize the T.A.R.'s.

C. Development of Methodology for Rural Water Technician (T.A.R.) Utilization

Appropriate utilization, including potential employers, for the T.A.R.'s will be determined. It is presently anticipated that they will form the full technical staff for field offices responsible for the construction of rural water systems and latrines. They could report to an engineer who would make regular visits to the field office but need not spend his full time in the field. The feasibility of this and other utilization schemes will be determined, as will their acceptability to Guatemalan institutions which are involved in this area. A cost-benefit study will be undertaken and a report will be made describing the degree of acceptance of the T.A.R. concept.

- 1. The following groups will be consulted:

- a. The Ministry of Public Health

- b. The National College (Professional Association) of Engineers
 - c. I.N.T.E.C.A.P.
 - d. INFOM (The National Institute for Municipal Development)
 - e. Private engineering firms
 - f. The National Program for Community Development
 - g. The Guatemalan Civil Service Bureau
- D. Integration of all Aspects of Methodology and Promotion of its Application
- 1. The following tasks will be performed:
 - a. Further consultations will be held with all groups earlier consulted regarding specific aspects of the methodology.
 - b. A cost-benefit study of the overall integrated methodology will be undertaken.
 - c. Intentions and commitments to utilize the T.A.R.'s will be sought.
 - d. A report will be made describing the total integrated methodology.

E. Time and Cost Inputs for Each Aspect of the Methodology Development

It is presently impossible to say precisely what fraction of the total budget will apply to each part of the methodology development. This is especially true in light of the overlapping nature of many of the tasks required for each part. Nonetheless, it is fair to say that roughly equal amounts of time and money will be devoted to each major part of the methodology, resulting in the following approximate breakdown:

a. Determination of potential funding sources	\$ 4,800
b. Determination of the ability of villages to pay back loans	\$ 4,800
c. Development of methodology for Rural Water Technician (T.A.R.) Training Program	\$ 4,800
d. Development of methodology for Rural Water Technician (T.A.R.) Utilization	\$ 4,800
e. Integration of all Aspects of Methodology and Promotion of its Application	<u>\$ 4,800</u>
TOTAL	<u>\$24,000</u>

III. FINANCIAL PLANA. A.I.D.1. Personnel:

a. U.S.

i. Project Director/Coordinator
(\$1,200/month, prorated for
3/4 time = \$900/month, for 6
months) \$ 5, 400

b. U.S., Local, Third-Country

i. Consultant fees (refer to Ap-
pendix C, Fee Schedule) \$ 5,000

c. Local

i. Secretarial and Bookkeeping/
Accounting \$ 1,700

ii. Legal fees \$ 300

2. Operating Costs:

a. Office rent (new Guatemala City office
will be opened especially for this pro-
ject) \$ 800

b. Office supplies \$ 1,900

c. Long-distance phone calls \$ 600

d. Leased car (fees, gas) \$ 3,100

e. Travel -

i. Airfare & ground transportation
including:

- 3 round-trips U.S. to Guatemala
or vice-versa, with stops in New
York and Washington \$ 2,100

- 2 round trips New York to Washing-
ton, or Chicago to Washington, or
Chicago to New York

ii. Per diems (for both Director and Consultants), including:

- Approx. 15 days in U. S. at \$11
- Approx. 25 days in Guatemala City at \$18
- Approx. 50 days in Guatemala outside of capital city at \$12

\$ 1,500

- f. U.S. Overhead (Fixed OPG contribution to partially cover items which include project related tasks of U.S. registered agent & related expenses)

\$ 600

3. Contingencies:

\$ 1,000

TOTAL OPG REQUEST

\$24,000

B. Agua del Pueblo

1. Personnel:

- a. Consulting
(10 man-days by members of ADP at \$70)

\$ 700

2. Operating Costs:

- a. U.S. overhead (project related costs over and above that covered by \$600 in OPG request, estimated)

\$ 400

TOTAL ADP TOTAL

\$ 1,100

C. Agua del Pueblo Project Preparation Costs

The following expenses took place prior to project approval and start-up, and thus A.I.D. procedures do not permit their inclusion in the formal financial plan presented above. Nonetheless, because these expenses were made by ADP and were necessary for the potential

success of the project, they are presented below to make possible a full perspective of the project financing. All of the expenses presented below took place during July, August, and September 1976, and were directly related to the project. In such cases where the items were directly contributed, their values are listed.

1. <u>Personnel costs:</u>		
a. Project Director/Coordinator (1 1/2 man-months at \$1,200)		\$ 1,800
b. Consulting by ADP members (15 man-days at \$70)		\$ 1,100
c. Secretarial fees		\$ 75
2. <u>Operating costs:</u>		
a. Office rent (pro-rated)		\$ 100
b. Office supplies		\$ 125
c. Long-distance phone calls		\$ 100
d. Vehicle expenses (maintenance, gas)		\$ 200
e. Travel:		
i. Airfare and ground transportation including: - 1 round-trip New York to Guatemala by interim ADP Director Richard Raines		\$ 500
ii. Per Diem (for interim ADP Director)		\$ 200
f. U.S. Overhead		\$ 200
TOTAL ADP PROJECT PREPARATION COSTS		\$ 4,400

APPENDIX A

BENEFITS OF RURAL POTABLE WATER SYSTEMS

"Are community water supply and excreta disposal facilities to be regarded as health services, as social services or as infrastructure for economic development? They are all of these." (Community Water Supply and Excreta Disposal Situation in the Developing Countries, W.H.O. Offset Publication No. 15, 1975, p. 13).

The benefits of water supply and excreta disposal can be discussed in the categories of Public Health Benefits, Productivity Benefits, Improvements in Village Institutions, Improving the Role and Status of Women, and Fire Protection. The following sections will discuss these benefits in the rural Guatemalan context.

I. PUBLIC HEALTH BENEFITS

"In most small towns and villages in rural areas, more health benefits can be gained from money spent on a water-supply programme than in any other way." (Water Supply for Rural Areas and Small Communities, W.H.O. Monograph No. 42, 1959, p. 10).

The inhabitants of Guatemala's rural highland areas are generally scattered in dispersed small villages ranging in size from two hundred to two thousand persons. The majority of the residents of these villages are descendants of the once-great Mayan civilization. Almost all of these communities are without a potable water system.

In many villages, water is drawn from small, muddy streams, or even from muddy holes in the ground that pass for wells. The people launder clothes and bathe in the same water used for consumption. Moreover, these sources are contaminated by human and animal defecation carried by the runoff of surface water. As a result, amebiasis, bacillary dysentery, and other parasitic ailments are ubiquitous. Furthermore, viral and infectious hepatitis, shigella, salmonella, and enteric bacterial infections are prevalent.

In a study done by Agua del Pueblo in August, 1974, in the small rural village of Panimaquib, Sololá, before the introduction of potable water, one hundred per cent of the children sampled from ages zero through ten proved positive in tests for ascaris, a parasitic round worm.

The low quality drinking water and lack of latrines contributes greatly to the generally poor public health in rural Guatemala, as evidenced by a child mortality rate for zero to five years of thirty-five percent.

Given the small percentage of communities with safe, clean water supplies, it is not surprising that the leading causes of death in Guatemala are gastritis and enteritis.

Many village water sources are not only impure, but are generally located far from the users' homes. Women carry jugs balanced

on their heads over rugged terrain for distances of up to four kilometers. Under such conditions, the amount of water used for consumption is almost always near the minimum required for survival. The use of large amounts of water for personal hygiene and home cleanliness is a luxury these villagers cannot afford. The unsanitary environment resulting from insufficient water and lack of latrines creates a breeding ground for other infectious diseases.

II PRODUCTIVITY BENEFITS

Millions of man-days are undoubtedly lost annually because of illness and death from water-borne diseases, although no actual count is possible. Further man-days are lost in the transport of water from the source to the home.

There are three ways in which illness from water-borne diseases can limit the economic potential of a community. Firstly, monies are drained from the community in order to pay for medicines, doctors' fees, and the transportation costs involved in securing treatment. These poor communities are already without a strong economic base. The diversion of funds outside of the community further erodes this base.

Secondly, illness and death from water-borne diseases lowers the potential production from the community. Income lost from sick days is also lost to the community, and at times the lost labor prevents full realization of the agricultural potential of the area.

Thirdly, enteric and parasitic diseases result in poor utilization of food (with diarrhea food can pass directly through the body with insignificant utilization). This causes a wastage of scarce food resources.

III IMPROVEMENTS IN VILLAGE INSTITUTIONS AND FURTHER COMMUNITY DEVELOPMENT

"Many villages in developing countries lack an organization of community leaders capable of dealing with present-day problems. It is sometimes argued that a community water supply project is one way of encouraging the emergence of such leadership, which would be able subsequently to deal with other community problems. It is also argued that because the village is required to pay for a valued service such as water supply, it will develop a 'habit of payment' for other worthwhile goods, and that this willingness to pay will indicate to planners that the village should be selected for further development. Both of these arguments are intuitively reasonable, but are as yet little supported by evidence."

(Village Water Supply: A World Bank Paper, March 1976, p.59)

Agua Del Pueblo has seen evidence that the above "intuitively reasonable" statement is in fact true and important. In most towns in which we have worked the community has gone on to build a new and better school, or to borrow money to buy materials to build better homes, or

to institute an adult education program in reading, writing, and basic mathematics. We attribute this new community involvement to three factors:

- a) The community organization needed for a water system and latrine construction project creates a structure through which other community activities can be channelled.
- b) The outside technical personnel needed to introduce a water supply and latrine program, also serve as a reference source for developmental ideas, financial availabilities, and methods of dealing with the power structure.
- c) The realization of a potable water system and latrine construction removes many previous community feelings of hopelessness and encourages the belief that by working together the community can improve its living environment.

It is the conviction of Agua Del Pueblo that the natural consequence of a potable water system and latrine construction project which utilizes a maximum community input, will be an increased amount of organized community activity.

IV IMPROVING THE ROLE AND STATUS OF WOMEN IN RURAL COMMUNITIES

In rural Guatemala virtually all of the water related tasks

fall to the women. While the men are out in the fields, the women stay home to cook, take care of the children, clean the house, wash clothes, and carry water home. The economic, social, and environmental restrictions are such that women neither have the opportunity to move out of this role nor to even improve their conditions while remaining within their traditional role.

The majority of the rural families in Guatemala have no water in their homes, and the women must make numerous daily trips to a river, lake, well, mud-hole, or in fortunate cases to a centrally located tap. They go to wash clothing, to obtain water for household use, and to bathe. The unfortunate fact is that these water sources are, as often as not, contaminated. Women must carry a two or three gallon jug home from the water source several times a day, and must make several trips a week to this source to wash clothing.

In an Agua Del Pueblo study, women in San Lucas Toliman were found to spend the equivalent of as many as 45 man-days per year in transit just to obtain the use of water. This is an incredible loss of time that could be more productively utilized, even within her traditional role, in more attention to household sanitary measures, family health, better meal preparation, or producing such salable items as weaving or pottery. Furthermore, with more available time certain women will choose to play a greater role in their community, providing leadership for community projects. Also women will find it possible to pursue

educational courses and begin the long journey to reshaping their role and status and thereby improving their lives and those of their family and neighbors.

In villages where a potable water tap has been installed for every several houses, the women are quick to see the advantage of such a close water source and, in fact, are often instrumental in pushing the community into accepting the expense and commitments required in installing a potable water system.

V. FIRE PROTECTION

In August 1976 an Agua del Pueblo member was driving through one of the new "shanty-town" villages that sprung up on the outskirts of the capital after the February 1976 earthquake. A two-year old infant had been left alone with a candle for light. The candle had fallen over and the dwelling went up in flames. The infant's body was charred and covered with third-degree burns. Neighbors hailed the ADP member to a stop, and he drove the screaming child and some neighbors to the hospital, where the child died. The neighbors mentioned that they had not been able to quickly put out the fire because they had no water system. It was only because it had rained that morning and they had collected some rain-water (intended for drinking), that they had been able to keep the fire from spreading.

The fire protection afforded by a water system can obviously be critical. If water supply is readily available, many fires can be extinguished before they cause much damage.

APPENDIX B
SELECTION CRITERIA FOR RURAL WATER TECHNICIAN TRAINEES

The methodology to be developed will include setting the criteria for determining if applicants for the positions of Rural Water Technician Trainees have sufficient technical and other aptitude. It is anticipated that this will include setting up a test to see if the applicants are competent in Guatemalan high school level algebra, physics, and chemistry. They would also have to read, write, and speak fluent Spanish, and would have to have been raised or already live in a rural area. Past these basic requirements, preference would be given to applicants who speak one of the major Guatemalan Indian languages, and/or have experience in a related field such as plumbing or surveying, and/or once began studies at an engineering school but could not continue for economic reasons.

APPENDIX C
CONSULTING FEE SCHEDULE AND COMMENTS

We will pay appropriate and competitive fees, except in the case of ADP members who will receive a maximum of \$70 per day. (It should perhaps be noted that this \$70 is modest in light of the fact that ADP members are experienced and respected engineers and administrators with degrees from such universities as Cornell, Harvard, Stanford, The University of Toronto, and Columbia). The following are anticipated typical fees, but in fact fees will vary with circumstances.

Local professionals	\$. 50/day
Non-Guatemalan professional specialists already in Guatemala, excepting ADP members (we anticipate consulting fee if any such specialists)	100/day
ADP members	70/day
U.S. professionals consulted within U.S. (we anticipate consulting fee if any such specialists)	100/day
Guatemalan Academy of Sciences Anticipated fee for preparation of Rural Water Technicians Training curriculum	1,000/total fee

We anticipate that the consulting fees will roughly be distributed as follows:

30 days by ADP members, charged to OPG, each \$70	\$2,100.00
10 days by ADP members, charged to ADP, each \$70	700.00
Guatemalan Academy of Sciences	1,000.00
38 days by local professionals, each \$50	<u>1,900.00</u>
TOTAL CONSULTING FEES	<u>\$5,700.00</u>

APPENDIX D
AGUA DEL PUEBLO FIELD-TESTED METHODOLOGY

The general principles of the ADP field-tested methodology are described in section I.C.1. of this proposal ("Elements and Development of the Field-tested Methodology"). In order to apply the concepts of its methodology to the CARE/AID/Ministry of Public Health water and latrine project in the department (state) of El Quiche, ADP prepared a detailed description of the stages of the methodology. The concept is that communities pass through stages, including selection for inclusion in the program, preparation, design, pre-construction, construction, and utilization/maintenance.

The following pages contain the detailed description of the ADP field-tested methodology, written IN SPANISH. For convenience the first page of the Spanish text is preceded by a translation of that page into English. This first page contains a brief summary of the detailed description of the methodology found on the following pages.

METHODOLOGY OF THE BASIC SANITATION PROGRAM FOR
RURAL AREAS IN EL QUICHE

December, 1975

I. SELECTION STAGE

- S1. Initial Contact (between project representative and community)
- S2. Initial Investigation
- S3. Initial Decision (to continue or to eliminate community from inclusion in the project)
- S4. Preparation for visits to community (by project representative)
- S5. Initial visit to community.
- S6. Second decision (to continue or to eliminate from inclusion)
- S7. Community meeting to declare agreement (with project objectives)
- S8. Creation of community water committee
- S9. Creation of formal request (by community for inclusion in project)
- S10. Third decision (to continue or to eliminate from inclusion)

II. PREPARATION STAGE

- P1. Consolidation begun
- P2. Reaffirmation (by community)
- P3. Placing of marker flags (indicating tentative locations of public water outlets)
- P4. Final placement of marker flags (indicating locations of public water outlets)

III DESIGN STAGE

- D1. Scheduling of work
- D2. Surveying
- D3. Engineering design
- D4. Legal arrangements (for piping right-of-way, etc.)
- D5. Completion of consolidation

IV PRE-CONSTRUCTION STAGE

- PC1. Fixing of inputs for Environmental Sanitation Department
(Ministry of Health) and CARE
- PC2. Fee agreements (to cover on-going maintenance)
- PC3. Contracting of supervising plumber/mason
- PC4. Legal agreement with county for their input

V CONSTRUCTION STAGE

- C1. Sending of construction materials
- C2. Execution

VI MAINTENANCE STAGE

- M1. Inauguration
- M2. Final Agreement
- M3. Maintenance
- M4. Evaluation

METODOLOGIA DEL PROGRAMA DE SANEAMIENTO
BASICAS AREAS RURALES EL ZUICHE

DICIEMBRE 1975

I. FASE DE SELECCION

- S1. Primer Contacto
- S2. Investigación Inicial
- S3. Primera Decisión
- S4. Preparación de Visitas
- S5. Visita Preliminar
- S6. Segunda Decisión
- S7. Asamblea de Afirmación
- S8. Formación del Comité
- S9. Formación de la Solicitud
- S10. Tercera Decisión

II. FASE DE PREPARACION

- P1. Consolidación
- P2. Reafirmación
- P3. Colocación de Bancieras
- P4. Fijación Formal de Bancieras

III. FASE DE DISEÑO

- D1. Programación de Trabajos
- D2. Topografía
- D3. Diseño de Ingeniería
- D4. Legalizaciones
- D5. Terminación de Consolidación

IV. FASE DE PRE-CONSTRUCCION

- PC1. Fijación de Aportes Saneamiento Ambiental y OARE
- PC2. Convenio de Tarifas
- PC3. Contratación de Maestro de Obras
- PC4. Legalización de Aporte Municipal

V. FASE DE CONSTRUCCION

- C1. Envío de Materiales
- C2. Ejecución

VI. FASE DE MANTENIMIENTO

- M1. Inauguración
- M2. Convenio Final
- M3. Mantenimiento
- M4. Evaluación

METODOLOGIA DEL PROGRAMA DE SANEAMIENTO
PARA AREAS RURALES DEL QUICHE

Oct. 1975

1. PAPEL DE SELECCION

1.1. PRIMER CONTACTO

El/los interesados pedirán información sobre el programa al TSR en las oficinas de Santa Cruz.

1.1.1. Si es al TSR:

1.1.1.1. Avisar a Santa Cruz por medio del Formulario S1 Primer Contacto.

1.1.1.2. Santa Cruz avisará al TSR sobre la factibilidad de viajar a la comunidad para llenar Formulario S2.1 Investigación Inicial.

1.1.2. Si es en las oficinas de Santa Cruz:

1.1.2.1. Llenar Formulario S1 Primer Contacto.

1.1.2.2. Llenar Formulario 2.1 Investigación Inicial al interesado para viajar, o

1.1.2.3. Mandar Formulario 2.1 Investigación Inicial al TSR respectivo y explicar la necesidad de viajar a la comunidad para llenarlo.

2. INVESTIGACION INICIAL

2.1. El TSR local viajar a la comunidad para llenar Formulario S2.1 Investigación Inicial.

2.2. Enviar dicho formulario a Santa Cruz del Quiché.

3. PRIMERA DECISION

3.1. El Equipo estudia Form. S2.1 Investigación Inicial y con base en los datos relacionados con la factibilidad de la fuente y el cálculo de costo por habitante, toma la decisión, clasificando en cuatro categorías:

Usar Formulario S3.1 Primera Decisión

- 3.1.1 Prioridad 1 (Se continúa la investigación)
- 3.1.2 Prioridad 2 (Cuando el costo por habitante es algo)
- 3.1.3 Esperando Datos (Clarificación de Investigación Inicial necesaria)
- 3.1.4 Fungtorizado (Cuando la fuente no es adecuada o existe otro obstáculo)

NOTA: Las comunidades de las tres últimas categorías pueden subir a Prioridad 1.

3.2 Enviar los resultados al TSP local.

- 3.2.1 Si la decisión es Prioridad 1, mandar Forms. S4.1 Escalas, S8.2 Infraestructuras, S4.1a Convocación de Primera Asamblea, S4.2 Primera Asamblea, S4.4 Resultados de la Primera Asamblea, S8 Comité.
- 3.2.2 Si la decisión no es Prioridad 1, mandar instrucciones.

4. PREPARACION PAFA VISITAS (Si la decisión es Prioridad 1)

- 4.1 Si la decisión es Prioridad 1, el TSP en base de reuniones y visitas domiciliars, convocará una asamblea, recopilando datos para Formularios S4.1 Escalas, S8.2 Infraestructuras, y si existe comité, Formulario S8 Comité.
- 4.2 Asamblea general con el siguiente objeto: (Véase Form. S4.2 Primera Asamblea)
 - 4.2.1 Todavía no se puede contraer ningún compromiso con la comunidad.
 - 4.2.2 Concientización.
 - 4.2.3 Explicación del programa, incluyendo requisitos.
 - 4.2.4 Decisión de la comunidad si quieren seguir, no contrayendo ningún compromiso.
 - 4.2.5 Establecer cual es el mejor día para reuniones y la Visita Preliminar.
 - 4.2.6 Explicar que van haber visitas domiciliars y entrevistas.

- 4.3 Cumplir Formularios S4.1 Escalas y S4.4 Resultados de la Primera Asamblea.
- 4.4 Seguir con Formulario S8.2 Infraestructuras
- 4.5 Cuando el TSR considere que la comunidad está preparada, debe avisar al equipo del Quiché. Mandar Formularios S4.1 Escalas, S4.4 Resultados de la Primera Asamblea, y si existe comité, S8 Comité.

5. VISITA PRELIMINAR

- 5.1 Programar Visita y dar aviso al TSR. Mandar Formulario S5.2 Convocación de Visita Preliminar.
- 5.2 Convocación de Visita Preliminar, solo con los líderes. Véase Formulario S5.2 Convocación de Visita Preliminar.
- 5.3 TSR avisa al equipo del Quiché sobre la factibilidad de Visita.
- 5.4 Realización de Visita.
 - 5.4.1 Trabajos Técnicos, incluyendo altimetría y croquis preliminar. Usar Formulario S5.4.1 Visita Preliminar Técnica. Y Formulario S5.4.1a Altimetría
 - 5.4.2 Trabajos Sociales. Véase Formulario S5.4.2 Visita Preliminar Social
 - 5.4.2.1 Revisar con el TSR los Formularios:
 - S4.4 Resultados de la Primera Asamblea
 - S4.1 Escalas
 - S8.2 Infraestructuras
 - S8 Comité (si hay comité)
 - 5.4.2.2 Visitas a los líderes detectados por el TSR, efectuar charlas sobre concientización estableciendo capacidades.

5.5 El Equipo del Quiché con el TSR local averiguará si tiene todo el apoyo de la municipalidad del lugar, en reunión con la corporación municipal, o por lo menos que esté dispuesto a dar mano de obra especializada. Llenar Form S5.5 Aporte Municipal.

6. SEGUNDA DECISION

6.1 Con base en los resultados de los trabajos técnicos, sociales y el aporte municipal, se toma la decisión sobre la factibilidad del proyecto. Hecho por el equipo del Quiché y el TSR del lugar. Mandar resultados a Saneamiento Ambiental.

Usar Form. 6.1 Segunda Decisión. Se clasifican en tres categorías:

- 6.1.1 Aceptado
- 6.1.2 Esperando Datos
- 6.1.3 Purgatorizado

NOTA: Las comunidades de las dos últimas categorías pueden subir.

6.2 Informar al TSR local.

6.2.1 Si la decisión es aceptada, mandar Forms. S7. 1a Guía Primera Entrevista Informal, S7.1b 1 Entrevista Informal, S7.4 Asamblea de Afirmación

6.2.2 Si la decisión no es aceptada, mandar instrucciones.

7. ASAMBLEA DE AFIRMACION (Si la Decisión es Aceptada)

7.1 Convocación de Asamblea de Afirmación. Debe hacerse a base de reuniones y visitas domiciliarias. Usar Forms. S7. 1a Guía Primer Entrevista Informal y S7.1b Primer Entrevista Informal

7.2 TSR avisa al equipo del Quiché sobre factibilidad de asamblea.

7.3 Seguir llenando Form. S8.2 Infraestructuras

7.4 Realización de Asamblea de Afirmación. Usar Form. S7.4 Asamblea de Afirmación.

- 7.4.1 Concientización
- 7.4.2 Explicación del Programa
- 7.4.3 Averiguar si la comunidad está de acuerdo con el programa, dando énfasis en los requisitos.
- 7.4.4 Decisión de la Comunidad.
- 7.4.5 Si no hay comité adecuado, programar Asamblea de Formación del Comité.
- 7.4.6 Ahora podemos decir que vamos hacer el proyecto, si la comunidad está dispuesta.

- 7.5 Llenar Form. S7.5 Resultados de Asamblea de Afirmación.
- 7.6 Reafirmar si tiene apoyo de la municipalidad junto con el alcalde o corporación municipal. Llenar Form. S7.6 lo. Reafirmación de Aporte Municipal
- 7.7 Programar con el TSR la formación del Comité, si no hay comité adecuado. Entregar Form. S8.1 Convocación Asamblea de Comité.
8. FORMACION DEL COMITE (Si no hay comité adecuado)
- 8.1 Convocación de Asamblea por medio de visitas domiciliarias, platicando sobre candidatos para el comité. Usar Form. S8.1 Convocación Asamblea del Comité.
- 8.2 Cumplir Form. S8.2 Infraestructuras
- 8.3 TSR avisa al equipo del Quiché sobre la factibilidad de la asamblea.
- 8.4 Asamblea para formar Comité. Usar Form. S8.4 Asamblea Comité:
- 8.4.1 Concientización
- 8.4.2 Volver a hacer énfasis sobre los requisitos en forma de preguntas.
- 8.4.3 Explicación de las responsabilidades del Comité.
- 8.4.4 Elegir el Comité.
- 8.4.5 Planificar Sesión de Solicitud.
- 8.5 Reunión con el Comité. Usar Form. S8.5 Reunión Comité.
- 8.5.1 Concientización
- 8.5.2 Responsabilidades del Comité.
- 8.5.3 Adiestramiento de la Formación de la Solicitud.
Entregar Forms.:
- S9. la Guía 2o. Entrevista Informal
- S9. 1b 2o. Entrevista Informal
- S9.2 Asamblea de la Solicitud
- S9.2.3 Solicitud
- 8.5.4 Orientación sobre Asuntos Legales
- 8.5.5 Planificar Reunión con la Municipalidad para Legalizar Comité y Reafirmar Aporte Municipal.
- 8.5.6 Llenar Form. S8 Comité
- 8.6 Llenar Form. S8.6 Resultados de la Formación del Comité

- 8.7 Reunión Municipalidad.
 - 8.7.1 Legalización del Comité. Véase Form. S8.7.1 Legalización del Comité.
 - 8.7.2 Reafirmar si el Comité tiene el apoyo de la municipalidad, el alcalde o la corporación municipal. Llenar Form. S8.7.2 2a. Reafirmación de Aporte Municipal.

9. FORMACION DE LA SOLICITUD

- 9.1 Convocar la Asamblea por medio de Visitas Domiciliares. Usar Forms. S9.1a Guía 2a. Entrevista Informal y S9.1b 2a. Entrevista Informal
- 9.2 Realización de Asamblea. Usar Form. S9.2 Asamblea de Solicitud.
 - 9.2.1 Concientización.
 - 9.2.2 Volver a explicar los Requisitos por medio de Preguntas.
 - 9.2.3 Decisión de la Comunidad
 - 9.2.4 Firmar Solicitud. Usar Form. S9.2.3 Solicitud
- 9.3 Mandar Resultados al Quiché.

10. TERCERA DECISION

- 10.1 Realización de Decisión. Esta decisión se hace con base en los resultados de la solicitud. Fijando factor de prioridad. Mandar resultados a Saneamiento Ambiental. Se clasifican en dos categorías:
 - 10.1.1 Aceptado (80% o más firmas)
 - 10.1.2 Esperando Firmas
- 10.2 Avisar TSR y Comité del Lugar.
 - 10.2.1 Si se acepta mandar: Forms. F1.1.1 Reunión Comité F1.1.2 Migración F.1.13 Asamblea de Confirmación, F.1.14 Preferencias de Programación, F1.1.5 Legalización de la Fuente, F1.1.6 Muestras de Agua, F1.1.7 Resultados de Consolidación.

II. FASE DE PREPARACION

1. CONSOLIDACION

El tiempo destinado para esta etapa depende del factor de prioridad, que está ajustado en base a los resultados de la preferencia de la comunidad. Puede ser de tres semanas a nueve meses.

1.1. Primer Mes

- 1.1.1 Reunión con el Comité. Usar Form. P1.1.1 Reunión Comité
 - 1.1.1.1 Concientización
 - 1.1.1.2 Explicación de Trabajos Sigüientes, incluyendo preferencia de épocas de trabajo.
 - 1.1.1.3 Adiestramiento sobre Asuntos Legales
 - 1.1.1.4 Libro especial de jornales
 - 1.1.1.5 Programación de Asamblea de Consolidación

- 1.1.2 Convocación de Asamblea de Consolidación por medio de visitas domiciliarias. Llenar Form. P1.1.2 Migración

- 1.1.3 Asamblea de Confirmación. Usar Form. P1.1.3 Asamblea de Confirmación
 - 1.1.3.1 Concientización
 - 1.1.3.2 Confirmar Requisitos
 - 1.1.3.3 Explicación de Requisitos
 - 1.1.3.4 Confirmación de Migración
 - 1.1.3.5. Escoger mejores épocas para colocar banderas, topografía y construcción.

- 1.1.4 Llenar Form P1.1.4 Preferencias de Programación

- 1.1.5 Legalizaciones
 - 1.1.5.1 Fuente. Véase Form. P1.1.5 Legalización de Fuente
 - 1.1.5.2 Comité. (si no se ha hecho en etapas anteriores) Véase Form. Sd.7.1 Legalización de Comité

- 1.1.6 Muestras de Agua. Véase Form. P1.1.6 Muestras de Agua

1.1.7 Llenar Form. P1.1.7 Resultados de Consolidación

1.1.8 Mandar informes al Quiché:
Form. P1.1.2 Migración
Form. P1.1.4 Preferencias de Programación
Form. P1.1.7 Resultados de Consolidación
 Copia de la legalización de la fuente.

1.1.9 Ajustar Factor de Prioridad. Programas siguientes etapas con base en el Form. P1.1.4 Preferencias de Programación.

1.1.10 Mandar por Letrinas

1.1.11 Quiché avisará al TSR y al Comité. Mandar al TSR los formularios respectivos.

NOTA: CADA MES EL COMITE DEBERA REUNIRSE Y REALIZAR UNA ASAMBLEA GENERAL PARA MANTENER EL INTERES.

1.2 Segundo Mes

1.2.1 Croquis. Véase Form. P1.2.1 Croquis

1.2.2 Censo. Véase Form. P1.2.2 Censo

1.2.3 Revisión de Croquis y Censo

1.2.4 Corregir Croquis y Censo

1.2.5 Mandar Informes al Quiché:

Copia del Croquis

Forms. P1.2.2 Censo

1.3 Tercer Mes

Programa de Educación. Véase Form. P1.3 Programa de Educación

1.4 Del Cuarto al Octavo Mes

Programa de Letrinización. Véase Form. P1.4 Letrinización

1.5 Noveno Mes

Programa de Reforestación. Véase Form. P1.5 Reforestación

2. REAFIRMACION

- 2.1 Reunión con el Comité
 - 2.1.1 Concientización
 - 2.1.2 Explicación de Banderas
 - 2.1.3 Programación de la Colocación de Banderas y Topografía.
- 2.2 Asamblea General
 - 2.2.1 Concientización
 - 2.2.2 Explicación de Banderas
 - 2.2.3 Programación de la colocación de Banderas y Topografía.
 - 2.2.4 Volver hacer énfasis en los requisitos.
- 2.3 Asuntos Técnicos (si no se ha hecho en etapa anterior)
 - 2.3.1 Croquis
 - 2.3.2 Censo
 - 2.3.3 Revisión de Censo y Croquis
 - 2.3.4 Corregir Croquis y Censo
- 2.4 Si Hay Tiempo Terminar Puntos en Consolidación
- 2.5 Avisar al Quiché

3. COLOCACION DE BANDERAS

- 3.1 Reunión con el Comité
- 3.2 Asamblea General. Explicar Banderas
- 3.3 Entrevistas Formales. Véase Form. P3.3a Guía Entrevistas Formales y P3.3b Entrevistas Formales
- 3.4 Colocación de Banderas por medio de Visitas Domiciliarias, dejando los que dependen de niveles.
- 3.5 Informar al Quiché.

4. FIJACION FORMAL DE BANDERAS

- 4.1 Reunión con el Comité. (Si hay preguntas sobre 3, 2 o 1 casas, debe explicarse sobre las aportaciones, hablando en forma clara, para evitar malas interpretaciones en la asamblea general.)

- 4.2 Asamblea
 - 4.2.1 Si han habido preguntas en la reunión del Comité, y hay preguntas en la asamblea general, el Comité puede explicar lo de las aportaciones.
 - 4.2.2 Si no han habido preguntas en la reunión con el Comité, y si hay en la asamblea, debe dejarse para la próxima semana y explicar al Comité en reunión para que se encarguen de informar a la comunidad.
 - 4.2.3 Si no hay ninguna pregunta, las banderas deben dejarse como están.
- 4.3 Si hay necesidad de recolocar banderas, debido a conexiones de 3, 2 o 1 casas, las banderas deben cambiarse haciendo visitas domiciliarias.
- 4.4 Reunión del Comité
- 4.5 Asamblea General
- 4.6 Informar al Quiché

III FASE DE DISEÑO

- 1. PROGRAMACION DE TRABAJOS
 - 1.1 Reunión del Comité
 - 1.2 Asamblea General
- 2. TOPOGRAFIA
 - 2.1 Recorrido
 - 2.2 Planimetría y Altimetría
(Se necesitan de 6 a 10 ayudantes de la comunidad)
 - 2.3 Revisión de Topografía
- 3. DISEÑO DE INGENIERIA
 - 3.1 Cálculos sobre Libroto del Campo
 - 3.2 Dibujo Planta y Perfil
 - 3.3 Diseño de Ingeniería Preliminar
 - 3.4 Cambios Topográficos
 - 3.5 Diseño de Ingeniería Final
 - 3.6 Dibujo
 - 3.7 Lista de Materiales

4. LEGALIZACIONES

- 4.1 Acta de Conexiones Domiciliarias y Casos de 2 o 3 Familias con Entrega de Dinero.
- 4.2 Servidumbres de Paso de Tubería
- 4.3 Terreno de Tanque de Distribución
- 4.4 Servicios Públicos

5. TERMINACION DE PUNTOS NO HECHOS EN ETAPA DE CONSOLIDACION

- 5.1 Programa de Educación
- 5.2 Letrinización
- 5.3 Reforestación

IV FASE DE PRECONSTRUCCION'

1. FIJACION DE APORTES SANEAMIENTO AMBIENTAL Y CARE

- 1.1 Preparación del Expediente
- 1.2 Envío del Expediente a Guatemala
- 1.3 Revisión por Saneamiento Ambiental
- 1.4 Reunión con Ingenieros por el Aspecto de Cálculos y Presupuestos

2. CONVENIO DE TARIFAS

Levantar un acta en la comunidad para confirmar el pago de las tarifas mensuales para mantenimiento del servicio. Funcionarios de Saneamiento Ambiental.

3. CONTRATACIONES DE MAESTRO DE OBRA

- 3.1 Estudio de planos y reconocimiento del terreno por personas interesadas en mano de obra especializada.
- 3.2 Presentación de cotizaciones a la municipalidad.
- 3.3 Reunión con la Corporación Municipal para la apertura de plicas y otorgamiento de la obra al mejor postor.
- 3.4 Firma del contrato de mano de obra especializada y aviso a Saneamiento Ambiental.