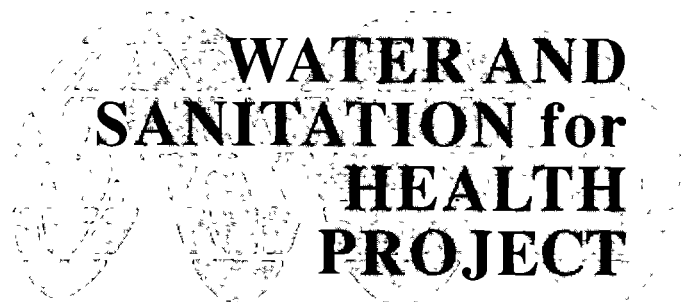


FINAL EVALUATION OF THE CARE/BOLIVIA CHILD SURVIVAL AND RURAL SANITATION PROJECT

Field Report No. 312
August 1990



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

Wash Field Report No. 312

**FINAL EVALUATION OF THE CARE/BOLIVIA CHILD SURVIVAL
AND RURAL SANITATION PROJECT**

Prepared for the USAID Mission to Bolivia
under WASH Activity No. 145

by

Andrew W. Karp
Patricia Martin
and
Sharon Guild

ISN 7993
827 B090

August 1990

Water and Sanitation for Health Project
Contract No DPE-5973-Z-00-8081-00, Project No. 836-1249
is sponsored by the Office of Health, Bureau for Science and Technology
U.S. Agency for International Development
Washington, DC 20523

RELATED WASH REPORTS

CARE/USAID/Bolivia Child Survival/Rural Sanitation Project Mid-Term Evaluation Workshop. Field Report No. 248. December 1988. *(Also available in Spanish.)*

CARE/USAID/Bolivia Child Survival/Rural Sanitation Project Review Workshop. Field Report No. 226. December 1987. *(Also available in Spanish.)*

CARE/Bolivia Water Supply and Small Scale Irrigation Program: A Final Evaluation of the USAID-Financed Project. Field Report No. 162. April 1986.

CONTENTS

CHAPTER	Page
ACKNOWLEDGMENTS	vii
ACRONYMS	ix
EXECUTIVE SUMMARY	xi
1. INTRODUCTION	1
1.1 Background	1
1.2 Scope of Work	1
1.3 The Evaluation Team	2
1.4 Evaluation Methodology	2
1.5 The National Context	4
2. PHOTOGRAPHIC OVERVIEW	7
3. THE INTEGRATED PROJECT	19
3.1 Design of the Integrated Project	19
3.1.1 Overall Design	19
3.1.2 Counterpart Design Issues	20
3.1.2.1 Water and Sanitation Component	20
3.1.2.2 Health Component	22
3.1.2.3 Community Participation Component	22
3.2 Implementation	23
3.2.1 Start-up/Project Review Workshop	23
3.2.2 Actual Integration of the Components	24
3.2.3 Project Coordination and Communication	26
3.2.4 Counterpart Performance and Strengthening	27
3.2.5 Changes to the Project Design during Implementation	28
3.2.6 Project Information System	29
3.2.6.1 Analysis of Passive Morbidity and Mortality Reporting	30

3.3	Cost Overruns	32
3.3.1	Central Questions Regarding Project Costs	32
3.3.2	Project Costs	32
3.3.3	Justification for Costs of the Water Component	33
3.3.4	Justification for Costs of the Latrine Component	35
3.3.5	Justification for Costs of the Health and Community Development Component	36
3.3.6	Explanation of the Cost Overrun	36
3.3.7	Financial Monitoring	36
4	WATER AND SANITATION	41
4.1	Design	41
4.1.1	Design of Water Supply Systems	41
4.1.2	Design of Latrines	41
4.2	Implementation	42
4.2.1	Water System Construction	42
4.2.1.1	Community Selection	42
4.2.1.2	Water Site Selection	42
4.2.1.3	Water Quality	43
4.2.1.4	Construction	44
4.2.1.5	Community Acceptance	44
4.2.1.6	Administration	45
4.2.1.7	Fees for Construction and Water System Connections	45
4.2.1.8	Completion Progress	46
4.2.2	Latrine Construction	46
4.2.2.1	Latrine Types	46
4.2.2.2	Fees	46
4.2.2.3	Community Acceptance	47
4.2.3	Water System Maintenance	47
4.2.3.1	Community Organization	47
4.2.3.2	Fees and Collection System	48
4.2.3.3	Maintenance Equipment and Materials	48
4.2.3.4	Water Treatment	48

4.3	Achievements	49
4.3.1	Sustainability of the Water and Sanitation Facilities	49
4.3.1.1	General Sustainability	49
4.3.1.2	Training and Performance of System Operators ..	50
4.3.1.3	Training and Performance of Village Water Committees	50
4.3.1.4	Existence and Adequacy of Backup Systems for Water and Sanitation Maintenance	50
4.4	Conclusions	51
5.	HEALTH EDUCATION	53
5.1	Design	53
5.2	Implementation	54
5.2.1	General Overview	54
5.2.2	Health Education	54
5.2.2.1	Educational Materials	54
5.2.2.2	Training in the Communities	55
5.2.3	Health Promoters	55
5.2.3.1	Selection	55
5.2.3.2	Training	55
5.2.3.3	Supervision	56
5.2.3.4	Incentives	56
5.2.3.5	Community Acceptance	56
5.3	Achievements	57
5.3.1	Accomplishments	57
5.3.1.1	Immunizations	57
5.3.1.2	Oral Rehydration Therapy	58
5.3.1.3	Growth Monitoring and Nutrition	59
5.3.1.4	Iodine Deficiency Disease	62
5.3.1.5	Hygiene Education	62
5.3.1.6	Latrine use	63
5.3.2	Sustainability	63
5.3.2.1	Immunizations	63
5.3.2.2	Oral Rehydration Therapy	64
5.3.2.3	Growth Monitoring	64
5.3.2.4	Iodine Deficiency Disease	64
5.3.2.5	Maternal Education in Hygiene	64
5.3.2.6	Latrine Use	65
5.3.2.7	Sustainability of Health Promoters	65
5.3.2.8	Existence and Adequacy of Backup Systems for Health Care	65

5.3.3	Project Impact on Child Diarrheal Morbidity and on Child Mortality	65
5.4	Conclusions	66
6.	COMMUNITY PARTICIPATION	67
6.1	Design	67
6.2	Implementation	68
6.2.1	Organization Types and Experience with Them	68
6.2.1.1	Water Committees	68
6.2.1.2	Mothers' Clubs	69
6.2.1.3	Leaders' Councils	71
6.3	Achievements	71
6.3.1	Overall Participation and Sustainability	71
6.3.2	Women's Participation and the Project's Impact on Women	72
6.4	Conclusions	73
7.	FAMILY GARDENS, NUTRITION, AND MICRO-IRRIGATION	75
7.1	Design	75
7.2	Implementation	75
7.3	Achievements	76
7.4	Conclusions	76
8.	RECOMMENDATIONS	77
8.1	Overall Recommendations	77
8.1.1	Project Duration and Scheduling	77
8.1.2	Coordination and Communication	77
8.1.3	Geographic Coverage	78
8.1.4	Midterm and Final Evaluations	78
8.1.5	Financial Monitoring	79

8.2	Water and Sanitation Component	79
8.2.1	Latrine Coverage	80
8.2.2	Pumped Systems	80
8.2.3	Monthly Water Fees	81
8.2.4	Ensuring Good Quality Water	81
8.2.5	Maximum Allowable Distance to Water Sources	81
8.2.6	Water Distribution Based on Pressure Zones	82
8.2.7	Timely Delivery of Construction Materials	82
8.2.8	Improvement of Existing Systems	83
8.2.9	Metering and Other Water Conservation Mechanisms	83
8.2.10	Backup for Operations and Maintenance	83
8.3	Health Component	84
8.3.1	Design	84
8.3.2	Immunizations	84
8.3.3	Diarrhea and Oral Rehydration Therapy	84
8.3.4	Growth Monitoring and Nutrition	85
8.3.5	Iodine Deficiency Disease Prevention	86
8.3.6	Maternal Education	86
8.3.7	Information System	86
8.4	Community Participation Component	87
8.5	Micro-irrigation and Family Gardens	88

TABLES

1.	Costs for Each Component of the Project	33
2.	Sources of Project Funds	34
3.	Costs of Various Types of Latrines	35
4.	Items That Contributed to the Cost Overrun	37

MAP OF PROJECT AREA	5
----------------------------	----------

ANNEXES

A.	Scope of Work For the Final Evaluation	89
B.	Interview Forms	97
C.	List of Persons Interviewed	117
D.	Itinerary of the Evaluation Team	119
E.	Project Information System	121
F.	Illustrative Schedule For On-Going Implementation of Integrated Water and Sanitation/Child Survival Projects	133

ACKNOWLEDGMENTS

The members of the evaluation team greatly appreciate the collaboration and support provided by CARE's staff both at headquarters and the regional field offices. Without the time and effort they spent making arrangements for field visits, providing documents and transportation, translating in Quechua and Aymara, and answering our endless questions, we could never have gotten our job done. They made it not only possible but pleasant.

We would also like to thank AID/Bolivia for all the assistance and information provided by many staff members.

Staff members of the counterpart institutions, the Regional Development Corporations, and the Regional Health Units (Unidades Sanitarias) were very helpful in providing information and explaining their roles in this complex project. We thank them for their collaboration.

And, especially, we are infinitely grateful to the countless people across the five departments of Bolivia we visited who welcomed us into their communities and answered our many questions with courtesy, good humor, and enormous patience.

We wish all of you well in this and future development efforts.

ABOUT THE AUTHORS

Andrew Karp is an independent consultant currently living in Guatemala. He is a sanitary engineer with extensive experience in water supply and sanitation projects in low-income communities. He has worked in Latin America and Africa.

Patricia Martin is an independent consultant specializing in community participation, women in development, and social analysis. She has worked extensively in Latin America.

Sharon Guild is a Regional Technical Advisor in primary health care for CARE in East Africa, currently living in Kenya. She is a pediatrician who has worked in primary health care for the past five years.

ACRONYMS

ARI	Acute respiratory infection
B	Boliviano (Bolivian currency unit)
BEC	Budget Expenditure Control
CARE	Cooperative for American Relief Everywhere
CORDEOR	Regional Development Corporation, Department of Oruro
CORDEPAZ	Regional Development Corporation, Department of La Paz
DSA	<i>Dirección de Sanamiento Ambiental</i> , Department of Environmental Health
FRLC	Federal Reserve Letter of Credit
NGO	Nongovernmental organization
ORS	Oral rehydration solution
ORT	Oral rehydration therapy
PAHO	Pan American Health Organization
PROCOSI	Umbrella organization of PVOs in Bolivia
PVO	Private voluntary organization
UNICEF	United Nations Children's Fund
US	<i>Unidad Sanitaria</i> , Regional Health Unit
USAID	U.S. Agency for International Development
VIP	Ventilated improved pit latrine
WASH	Water and Sanitation for Health Project
WHO	World Health Organization

EXECUTIVE SUMMARY

This report constitutes the final evaluation of the four-year CARE Child Survival and Rural Sanitation Project in Bolivia financed by the U.S. Agency for International Development (USAID) as Project No. 511-0599. The evaluation was conducted in March 1990 in 20 of the 200 project communities by a three-person team from WASH consisting of a sanitary engineer, a pediatrician/health education specialist, and a specialist in community organization and participation, assisted by an epidemiologist and a civil engineer employed by USAID/Bolivia.

I. Background

The purpose of the project, which began in August 1986, was to address the principal causes of illness and death among children under the age of four in Bolivia's rural communities. It had three integrated components: the provision of health services, including health education; the provision of potable water and sanitation facilities; and community organization and participation.

USAID provided a grant of \$5.0 million, and contributions from counterpart institutions, the participating communities, and CARE totaled \$3.9 million.

Approximately 59,000 people in 200 rural communities have benefited from the project, which was scheduled to end in August 1990.

II. Conclusions

- The project achieved worthwhile results in all three components, confirming that integration was both workable and advantageous, and the overall conclusion of the evaluation is positive. The unanticipated enthusiasm of the communities for the latrine component was remarkable.
- An additional component—micro-irrigation for family gardens—would have furthered the objectives of the project. The original project proposal did include the promotion of family gardens to improve nutrition, but a later amendment eliminated this element.

- The regional development corporations proved to be reasonably good counterparts, except for some serious delays in the payment of funds to CARE which were ultimately remedied.
- The regional health units (*unidades sanitarias*) were less active, in part because they were merely asked to collaborate in what CARE and the corporations had already developed.
- The average per capita cost of the project in communities where all project components were implemented was \$160, which was reasonable considering the relatively high level of service the project provided.
- During most of the life of the project, the financial monitoring control was poor, although in the final year this was improved to an adequate level. As a result of this deficiency, the project management was surprised to discover, two-thirds of the way through the project, that an additional \$0.65 million was needed. USAID approved a \$0.50 million budget increase and CARE made up the balance.
- All water supply systems provided house connections, and generally were well designed and constructed. The quality of the water met World Health Organization guidelines for rural water supplies.
- The latrine component of the project was exceptionally successful and very popular, particularly with users who received latrines with pour-flush water seals. Some of the dry ventilated pit latrines were improperly constructed, had odor problems, and were unpopular.
- The health education component achieved most of its objectives, including a 90 percent immunization coverage, 50 percent ORT use, and 85 percent regular attendance for growth monitoring.
- The plan to place trained nurses and auxiliaries as supervisors in the villages 20 days a month provided excellent on-the-job training for promoters.
- A major accomplishment of the project was the creation or strengthening of community organizations, including water committees, mothers' clubs, and leaders' councils, and the selling of the idea of community ownership of, and responsibility for, the water systems.

- The impact on women was particularly favorable, both by helping to incorporate them in the community leadership through the mothers' clubs, and by saving them the considerable time and energy used in hauling water.

III. **Recommendations**

- Effective integration and coordination require that the preliminary discussions and final signing of a project agreement should recognize all counterpart institutions as full and equal participants. Partly because they were neglected, the regional health units (*unidades sanitarias*) showed little interest.
- USAID could maximize the impact of the projects it supports by urging coordination between projects in the same geographic area. The evaluation team noted several instances where duplication, gaps in coverage, and the resulting conflicts at the community level could have been avoided.
- In determining the appropriate duration and scheduling of a new project, the ongoing nature of water, sanitation, and health needs should be taken into account. An abrupt startup, short duration, and abrupt termination should be avoided. If possible, the project should run for seven years.
- If there is to be a follow-on project, it should begin with as little delay as possible (perhaps by September 1990) so that CARE can retain its experienced field staff.
- The project made the mistake of relying on the Federal Reserve letter of credit (FRLC) balance to indicate the funds that were still expendable. This information reached Bolivia several months after it was current and did not provide the level of detail needed. It would be advantageous if funds for any future project were to be directly transferred by the USAID Mission to CARE/Bolivia, to ensure that both USAID and project management have better financial control.
- Water sources with bacteriological pollution should be treated with a slow sand filter, a low-technology technique that is effective and affordable. Chlorination should not be considered a reliable long-term method of ensuring clean water, because of the need for a constant

supply of the chemical and evidence that throughout the developing world most rural chlorination systems are eventually abandoned.

- The project's policy of subsidizing roughly two-thirds of the cost of all latrines, no matter how expensive, led to a depletion of funds before all those communities requesting latrines of any kind could be served. A moderate fixed subsidy, requiring beneficiaries who select the more expensive models to meet the difference, would be more equitable.
- Any future project should consider how to cover the health care of all children, even those whose parents do not or cannot afford to use the water system.

Chapter 1

INTRODUCTION

1.1 Background

The purpose of the CARE/Bolivia Child Survival and Rural Sanitation Project, financed by the U.S. Agency for International Development (USAID) as Project No. 511-0599, was to address the principal causes of illness and death among children under the age of four in Bolivia's rural communities. The project was carried out in the departments of Chuquisaca, La Paz, Oruro, Potosi, and Tarija. It had three integrated components:

- Provision of health services, including health education
- Provision of potable water and sanitation
- Community organization and participation

USAID provided a grant of \$5.0 million for water supply, basic sanitation, health, and community organization from August 1986 through August 1990. Cash and in-kind contributions from counterpart institutions, the beneficiary communities, and CARE amounted to approximately \$3.9 million, bringing the total project investment to approximately \$8.9 million.

About 59,000 people in 200 rural communities have benefited from the project.

This report constitutes the final evaluation, performed by the Water and Sanitation for Health (WASH) Project in conjunction with CARE, in response to a request received in December 1989.

1.2 Scope of Work

The scope of work (Appendix A) emphasized that

"the purpose of the evaluation is to assist the Mission to assess the strengths and weaknesses, accomplishments and failures of the existing CARE Child Survival and Rural Sanitation Project, and to make recommendations for a follow-on project beginning in FY91."

At a team planning meeting on March 6, 1990, Paul Hartenberger, Chief, Health and Human Resources Office for the USAID Mission, emphasized that the priority should be to present lessons learned from the existing project and recommendations following from them, so as to help CARE prepare the best possible follow-on project.

1.3 The Evaluation Team

The evaluation team, which began work in Bolivia on March 5, 1990, consisted of: Andrew Karp, team leader and sanitary engineer (WASH consultant); Patricia Martin, community participation specialist (WASH consultant); and Sharon Guild, pediatrician and health education specialist (CARE/East Africa Technical Assistance Team).

They were assisted by Joel Kuritsky, epidemiologist, and Matt Chaney, civil engineer, both of USAID/Bolivia, who inspected the work of the project in a limited number of communities to supplement the field observations of the team.

1.4 Evaluation Methodology

The evaluation methodology involved visits to 20 (10 percent) of the project communities, covering all five departments in which the project had been implemented, and interviews with CARE staff in the five departments and with counterpart personnel in four of the five departments.

The community visits ran an average of three-and-a-quarter hours each, and commenced with a group meeting with members of the water committee, the water system operator, and any other community leaders who were available (such as the president of the mothers' club). After the meeting, the members of the evaluation team dispersed as follows:

- The sanitary engineer, accompanied by the water system operator and often by members of the water committee, inspected a few household latrines and water taps, and parts of the water system such as the main pipelines, the storage tank, and the water intake.
- The pediatrician visited some homes and interviewed mothers about health matters.
- The community participation specialist visited other homes and interviewed residents about their participation in the project.

The standard forms used for the interviews are presented in Appendix B.

During the team planning meeting it was decided that:

- Field information would be collected only by members of the evaluation team and the two occasional team members, not by people who had worked directly for the project

- All five departments should be visited and the team should always be present together
- The 20 communities to be chosen would be randomly selected from communities closest to the route the evaluation team would travel

These decisions were necessary for the accomplishment of the scope of work, but they placed limitations on both the gathering and the analysis of information by the health education component.

The health education evaluation attempted to determine what mothers were doing, not simply what they had learned. At houses visited, the "road to health" cards for each child were examined, and the dates of birth, vaccinations, and most recent weighing were noted. Mothers were asked to explain the significance of the color of the yam on the card, and about the occurrence of a cough and/or diarrhea in the past two weeks. They were asked to explain what they had done for a child with diarrhea (whether or not this had been in the last two weeks), and were asked to demonstrate the preparation of either an oral rehydration solution (ORS) or *suero casero* (a homemade sugar and salt solution). Latrines, water connections, and water storage areas were examined for function, use, and cleanliness.

In addition to the home visits, focus group interviews, usually covering both health education and community participation questions, were conducted in eight of the 20 communities visited.

Because of the evaluation logistics, most communities were visited between 9:30 a.m. and 12:30 p.m., or 2:00 p.m. and 5:30 p.m. Ideally, these visits should have started by 7:00 a.m., when the mothers were still home. The houses should have been chosen randomly and revisited if the mother was not in. In fact, the sample visited by the evaluation team was not a random sample because many mothers were not home during the visiting hours chosen and there was seldom time to walk to the more distant houses. The president of the mothers' club, the wife of the president of the water committee, and the next-door neighbor of the promoter were heavily represented in the sample. This was the result of the promoter's taking the evaluators directly to houses where the mothers were known to be at home. In several villages, the decision was made to interview a smaller number of mothers and to seek out families living far from the center of the village. Unfortunately, no mothers were ever found at home.

Because the health practices survey was not a random sample nor of sufficient size to be statistically significant, this report places little emphasis on the percentages of practices found. Rather, the findings are viewed qualitatively to see if they support the reporting of the information system and if they indicate any consistent practices.

1.5 The National Context

The project focus on small rural communities reflects the population distribution in the country. Bolivia, with a total population approaching seven million, is the least densely populated and most rural country in South America. There are an average of only six inhabitants per square kilometer, and approximately one-half of the national population lives in rural areas.

The overwhelming majority of the project beneficiaries work in the agricultural sector and are extremely poor. Again, this reflects the national context, in which 46 percent of the economically active population is employed in the agricultural sector, and the average rural inhabitant (*campesino*) has an income of only about one-quarter of the per capita gross national product. UNICEF has determined that 85 percent of the population lives below the poverty threshold, which is the third lowest in the world (UNICEF, 1990). According to a 1985 study by the International Fund for Agricultural Development, between 46 and 73 percent of the rural population is "critically poor," a definition that takes into consideration extremely low income levels, poor nutrition, high infant mortality, low life expectancy, and other factors.

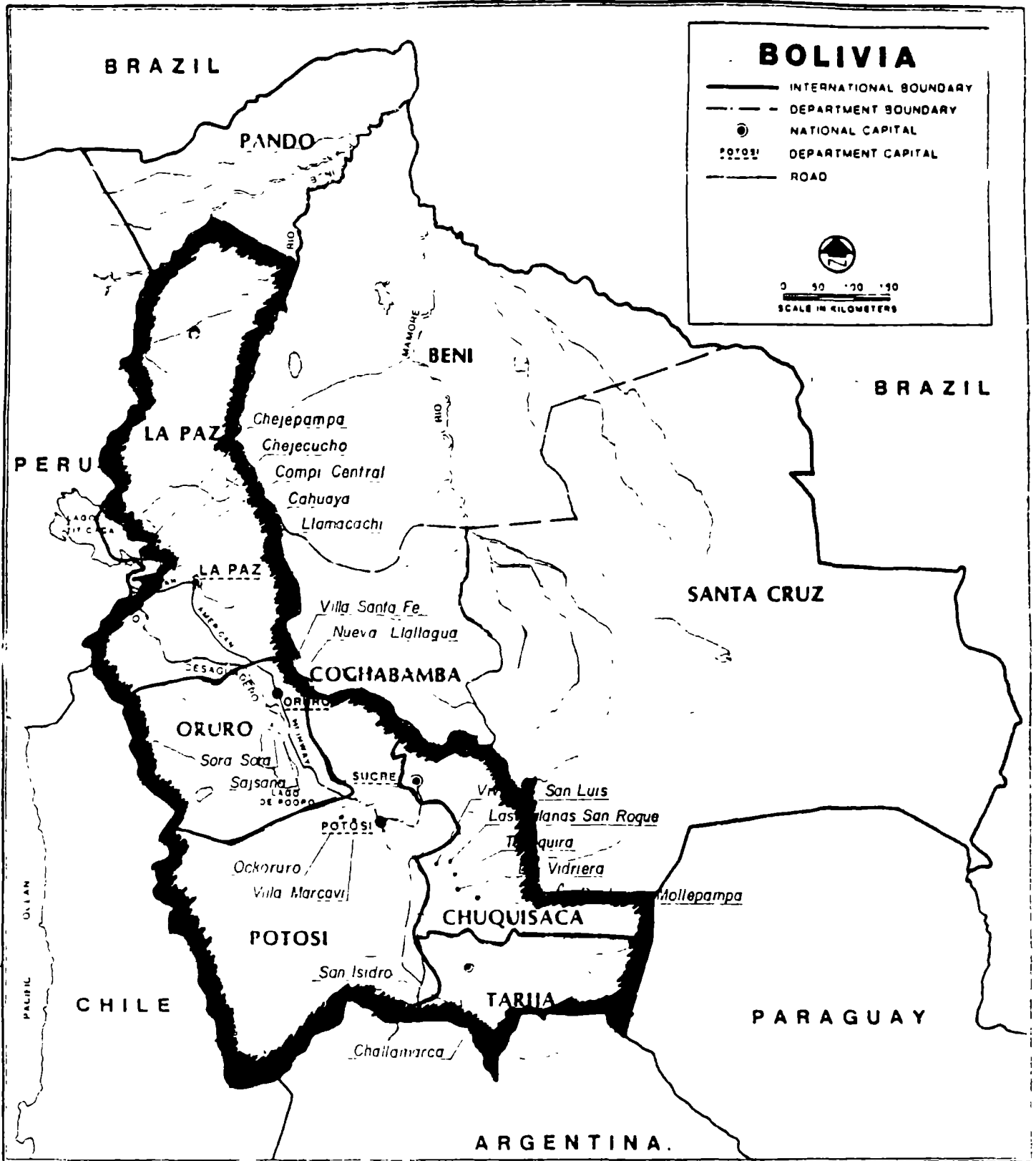
Bolivia has low coverage in water systems and health services, especially in the rural areas where the project has been implemented. Less than 31 percent of the rural population has water services, less than 13 percent has latrines, with a much lower percentage using them, and less than 30 percent has regular health services (Instituto Nacional de Estadística, 1989).

Health indicators for Bolivia are generally the worst in Latin America. Average life expectancy is only about 53 years. Infant mortality, at approximately 100 for every 1,000 children under the age of one year, is among the highest. At the start of the project, the national mortality rate for children under five years of age was about 210/1000, and in the *altiplano*, where the project has been implemented, it was about 330/1000. In the *altiplano*, approximately 75 percent of the deaths among children under the age of five are caused by diarrheal and parasitic illnesses (Ministry of Health and WHO/PAHO, 1986).

The Bolivian experience in maintaining rural water systems, using latrines, and providing continuous health services to the rural area has been poor. A high percentage of the latrines in the country are not used, and most of those that are used are poorly maintained. Similarly, in health, the personnel turnover in rural areas is high, and receipt of medicines and vaccines is irregular.

The Ministry of Health budget fell from 9 percent of the national budget in 1979 to 3 percent in 1983 as a result of deteriorating economic conditions. With limited funds and personnel, the Ministry's efforts to reach the rural areas have been minimal. Many national NGOs and international organizations have supplemented such efforts with programs including oral rehydration therapy (ORT), vaccinations, and education in child health care. The CARE project should be seen in this context.

MAP OF PROJECT AREA



Chapter 2

PHOTOGRAPHIC OVERVIEW



Photo 1: This youngster is not afraid of weighing pants and scales. He has been weighed every month by the health promoter in his village since he was an infant, as part of the project's growth monitoring health program



Photo 2: This health promoter from La Palca, Potosi, took the evaluation team to the homes of the families which she has been responsible for teaching. She carried her baby on her back and her "road to health" cards in her bag. In this photo she is showing us one of the growth monitoring charts that the project has promoted



Photo 3: A mother demonstrates how to mix *suero casero*, a homemade sugar and salt rehydration solution to treat infants with severe diarrhea.



Photo 4: The women in the mothers' club in Andamarca, Chuquisaca, have embroidered their own teaching aids on cloth. These are hung on the walls of their meeting room as a colorful decoration as well as a reminder of their health education lessons.



Photo 5: These women are from the same mothers' club as those in the previous photo. They are proud of their club, where they meet every Saturday morning to learn how to keep their children healthy, and bake bread to raise funds for club improvements, like glass windows and furniture



Photo 6: The whole community, women as well as men, has turned out in Ajlla Pata Pata, La Paz, to work on construction of their long-awaited water system. Construction was delayed nearly three years while this community worked out an agreement to share a water source with another community



Photo 7: This woman's recovery from a serious illness has been made a little easier because she now has water and a latrine next to her house in Maquelaya, La Paz. She saves about an hour a day by not having to carry water from a spring, and can do her washing much more quickly and easily



Photo 8: An evaluation team member interviews two women in Maquelaya, La Paz, with the help of an Aymara-speaking CARE supervisor. These women were interested in health and wanted to learn more, but had difficulty attending the meetings every Thursday morning, because this interfered with their cooking and animal-tending duties



Photo 9: In Chalarca, Tarija, the evaluation team found the only woman officer of a water committee among the 20 communities visited. She is obviously proud of her position as treasurer. The women in this community are dynamic—they organized their own mothers' club about seven years ago and built their own meeting place with the help of the community. They have an active program of health education, literacy, cooking, and needlework instruction.



Photo 10: This woman is drawing water from her yard tap, typical of many of the systems constructed by the project. Her village of Andamarca, Chuquisaca, completed its system in October 1989, and the 31 participating families now have a reliable water supply



Photo 11: This combination of a yard tap, wash basin, and latrine in the village of Compi, La Paz, is one of the most popular options the project offers to beneficiaries. The hose in the foreground and the greenhouse in the background point to the very common use of domestic water for garden irrigation, even though the systems were not designed to supply enough water for this purpose.

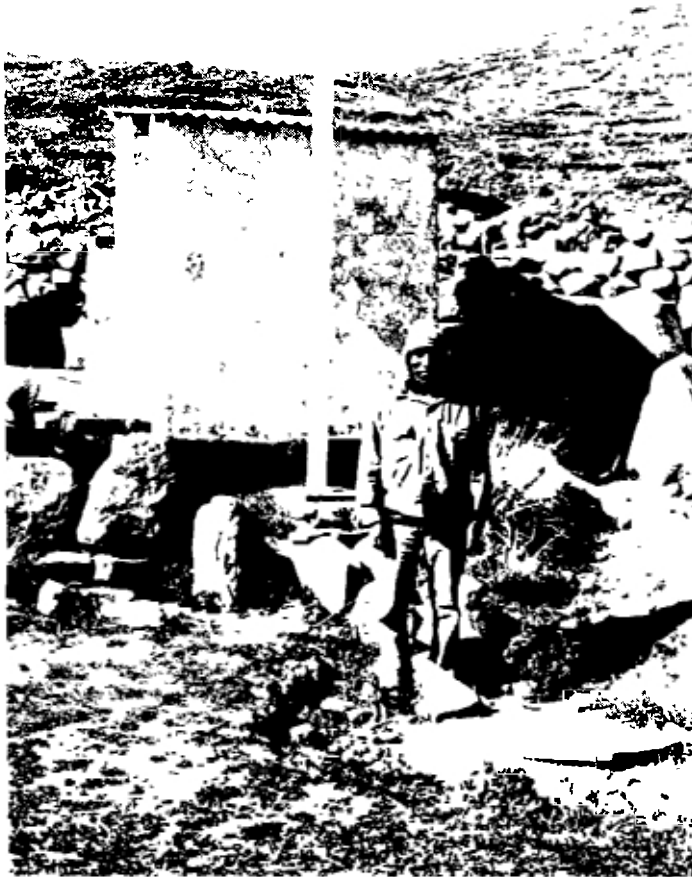


Photo 12: This photo in the village of Maquelaya, La Paz, shows a latrine design very popular with beneficiaries because it has no objectionable odors and does not attract flies. This latrine includes a pour-flush water seal (shown in the next photo), and an absorption pit, the top of which can be seen in the foreground. It also includes a ventilation tube, which is probably unnecessary.

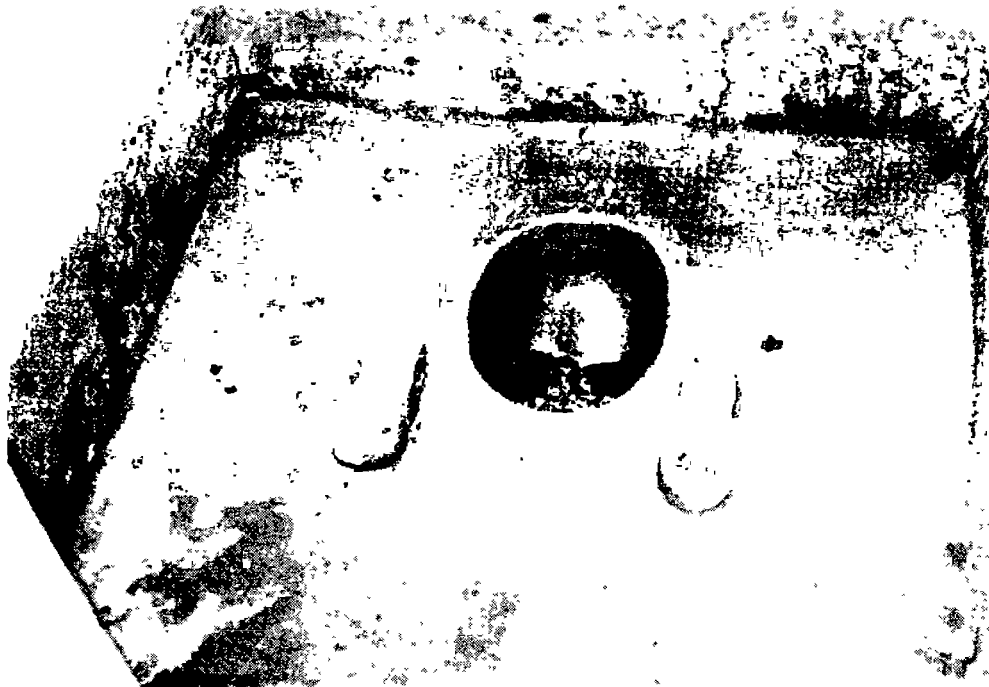


Photo 13: This photo shows the pour-flush water seal in the interior of the latrine pictured in the previous photo



Photo 14: This yard tap and latrine in the village of Monte Sandoval, Chuquisaca, are typical of many in the project. The latrine is of the very popular pour-flush water seal design, which eliminates odor and fly problems.



Photo 15: In the village of San Isidro, Tarija, many families have installed modern and somewhat luxurious bathroom facilities like these, which even include an electrically heated shower. Although these are very popular amongst users who can afford them, they involve a greater financial subsidy from CARE, and require a larger per capita water supply. Such expensive systems should be constructed only where the beneficiaries agree to pay the full cost above that of a more basic system.

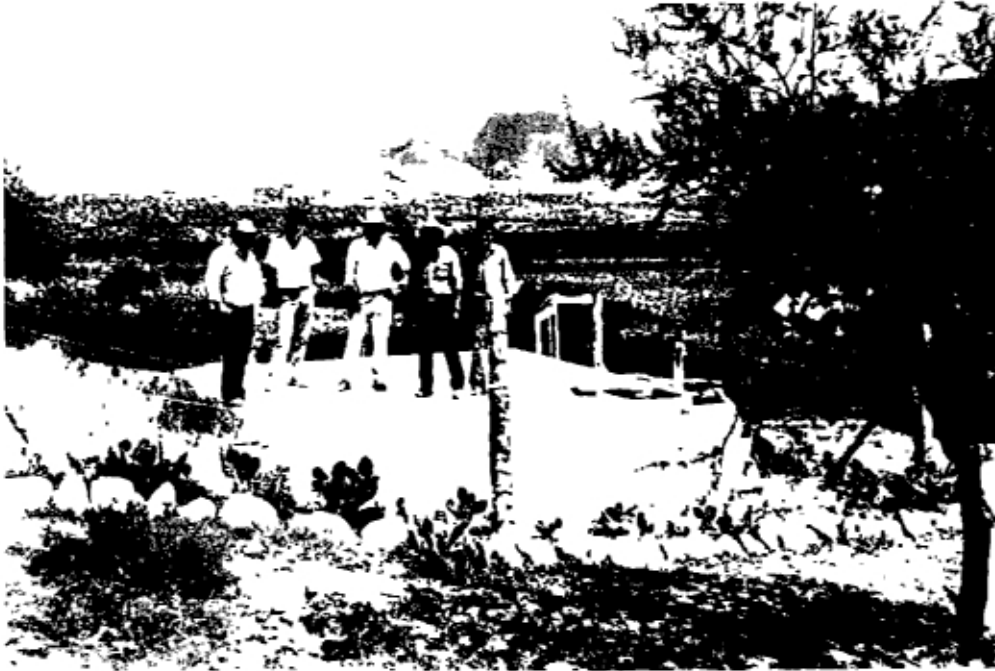


Photo 16: This water storage tank in the village of Chalarmarca, Tarija, is typical of tanks constructed by the project. It is well designed and solidly constructed.



Photo 17: This water intake serving the village of Usfamayu, Chuquisaca, is fairly typical of intakes where the project has had to capture water from rivers. These intakes, even when carefully constructed, cannot guarantee the same quality of water as an artesian spring, but often are the only available source.



Photo 18: This de-sanding sedimentation tank in the village of Primero de Mayo, Chuquisaca, is typical of designs used by the project when the water source contains sand or mud, such as the source shown in the previous photo. Such a tank helps substantially but does not ensure completely clean water, nor can it alone guarantee the quality of the water supply

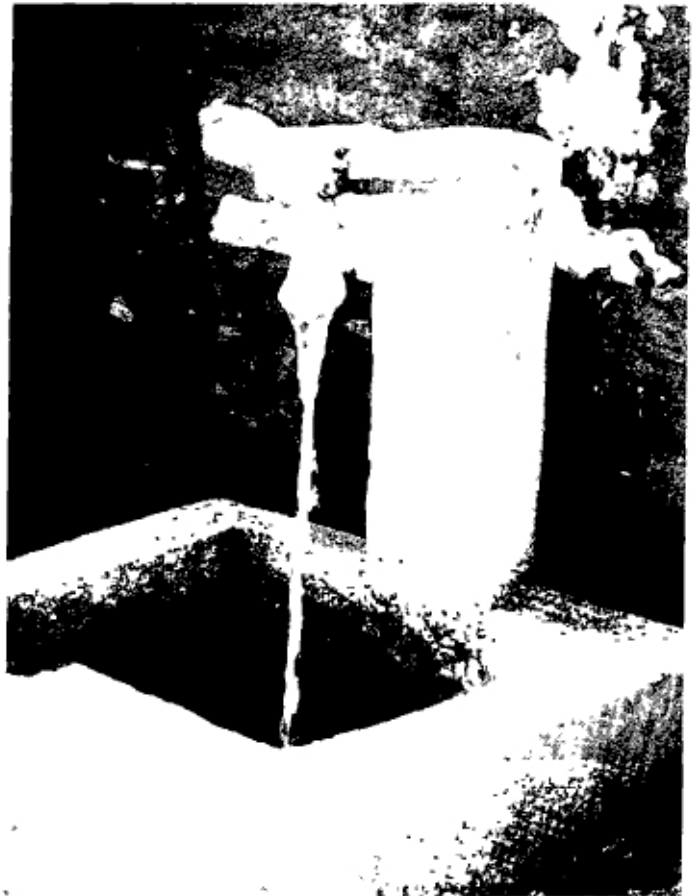


Photo 19: This photo shows cloth being used to filter the water at a household tap in the village of Ockururo, Potosi. Families adopt this measure when the water has a dirty or cloudy appearance.



Photo 20: This photo shows the motorized pump in the village of Nueva Llaguas, Oruro. Although this pumped system has no technical problems, the villagers can only afford to pay a monthly tariff of one Boliviano (\$0.33), and as a result there is only enough diesel fuel to provide water for about 45 minutes a day. The operation and maintenance cost of motorized pumps is a problem for the few such systems the project has constructed.

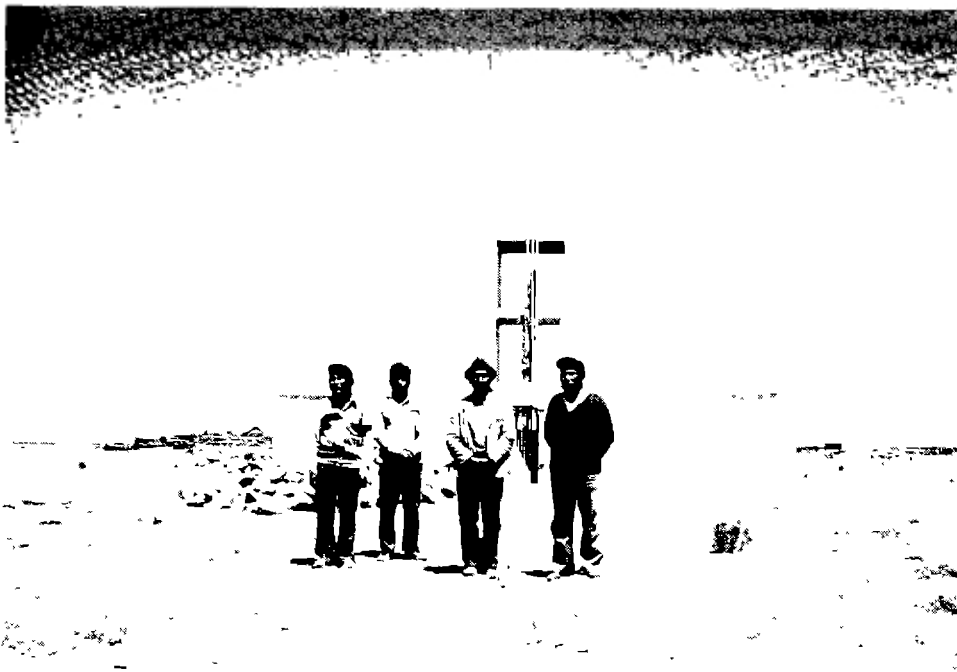


Photo 21: This photo shows the elevated tank which is supplied by the pump in the previous photo. This system has no serious technical problems, but the villagers cannot afford to use it adequately



Photo 22: These PVC pipe spans are in the pipeline serving the village of Cayara, Potosi. Such exposed spans should always use galvanized steel pipe, but the project had to substitute plastic pipe temporarily because of a long delay in the delivery of the steel pipe which will later replace it. Many of the systems faced this management problem during construction.



Photo 23: This family garden in the village of Maquelaya, La Paz, is irrigated with water from the new drinking water system. There is a great demand for such micro-irrigation water, and such application is beneficial in terms of improving diets and incomes. However, most of the systems were not designed to provide adequate quantities of water for this purpose.

Chapter 3

THE INTEGRATED PROJECT

3.1 Design of the Integrated Project

3.1.1 Overall Design

The CARE project, approved for funding by USAID/Bolivia in August 1986, was designed to reduce infant and child mortality in five rural departments of Bolivia through an integrated series of health, water, and community promotional activities that included:

- Building village-level water systems and latrines
- Training volunteer village health promoters to teach mothers basic child survival techniques (immunization, growth monitoring, improved nutritional practices, oral rehydration and diarrhea prevention, iodine deficiency disease prevention)
- Developing institutional capacity at the village level to sustain health and water services

This was the first USAID-funded project (and possibly the first project of any kind) in Bolivia that attempted to integrate potable water, sanitation, health, and community institution building. To accomplish this objective, CARE staff needed to work closely with Bolivian counterparts in the departmental development corporations and the local sanitary units (*unidades sanitarias*) of the Ministry of Public Health.

At the community level, the integration of activities was to be accomplished by a supervisor—a full-time CARE employee, either a nurse or an auxiliary trained and certified by the Bolivian government, who would spend at least three days a month in each community and be responsible for community organization and training of village leaders and volunteers. The supervisors (one for every seven villages) would be supervised by technical assistants for health (a doctor), water (an engineer), and social development (a social worker) in each department.

The water supply, sanitation, and health interventions were integrated in relation to both project implementation and their anticipated impacts. Because of the keen desire of typical rural communities to have improved water supplies, the water supply component of the project was used to both motivate the community to participate in the overall integrated

project, and give added credibility and prestige within the community to the people who were promoting the integrated project.

3.1.2 Counterpart Design Issues

The role of the principal counterparts, the development corporations in the five regions, is spelled out, though not in great detail, in agreements (*convenios*) signed with each corporation. While the role of the Ministry of Health, through its regional *unidades sanitarias* (US), was laid out in general terms in the proposal, formal agreements with the US and with the Ministry's department of environmental health [*Dirección de Sanidad Ambiental* (DSA)] were not envisioned. There has been considerable progress over the life of the project in achieving integration both of the project components and of the participating institutions. However, partly because of the way in which the agreements between CARE and the counterpart institutions were conceived, and partly because of their lack of detail and their somewhat unrealistic expectations as to counterpart performance, a number of design issues have arisen. These issues are discussed briefly in the following subsections.

3.1.2.1 Water and Sanitation Component

The water and sanitation component was designed to consist predominantly of gravity-flow water systems and latrines. CARE and the development corporation in each region were to collaborate in site selection, feasibility studies, topographic studies, construction and maintenance of water systems and latrines, and training of community members and volunteers. The agreement with each corporation also specified the counterpart funds it was to provide, in addition to its in-kind contribution. DSA was also supposed to develop standardized criteria for the design of water systems, provide operation and maintenance support after a year of CARE support, and participate in training courses for the communities.

The implementation section of this chapter and Chapter 4 discuss in some detail what happened when water and sanitation activities were carried out. Although the corporations achieved a great deal, the design issues described below limited results.

- Although the project was conceived as an integrated effort comprising three major components (water and sanitation, health, and community participation) to be carried out by CARE and its several counterpart institutions, the agreements specifying the participation of the counterparts were not integrated. Formal agreements were signed only with the corporations, and were presented to the US and

DSA separately after the fact. The agreements noted the three components, but did not detail the role of any counterparts except the communities. The effect was to focus the participation of the corporations on water and sanitation and limit their ability to take a broader coordinating role within the integrated project, even though they are supposed to be the principal development agencies for their regions. Coordination with CARE tended to occur only within the water and sanitation component; most corporations were largely unaware or unconcerned about what was being done in the other components and by other institutions. It should be noted that both CARE and the counterpart institutions are well aware of this deficiency. New projects are now being undertaken through joint agreements among all parties.

- The basic design of the project had already been determined before the agreements with the counterpart corporations were signed, limiting the possibility of joint planning and their full participation in decision making.
- The roles and responsibilities of the corporations were not defined in sufficient detail to determine precisely what they were supposed to do and what CARE staff would do, leaving gaps and overlaps in responsibilities and thus weakening accountability for performance.
- While the proposal recognized some of the limitations faced by the corporations and especially DSA, expectations of their ability to assume the responsibilities specified (particularly operation and maintenance backup) were in most cases not sufficiently realistic and did not adequately take into account their personnel and resource limitations.
- The amount of counterpart funding agreed to did not take into account the difficulties the corporations faced in identifying and keeping track of operating costs attributable to the project (e.g., salaries, per diem allowances, transportation and fuel, depreciation, accounting and reporting) in addition to their cash contributions. Therefore, the actual percentage of counterpart funding was in some cases considerably higher than originally specified and may have constituted an undue burden on corporations, exacerbating their difficulties in complying with the project agreements.

3.1.2.2 Health Component

While the health component was designed largely for execution at the community level by trained community health promoters, the US were assigned important responsibilities for training, coordination with other health organizations, provision of supplies, and promotion and education activities. The following design issues adversely affected the fulfillment of these responsibilities by the US.

- Because CARE's traditional counterparts had always been the corporations, formal agreements were negotiated and signed only with them and later presented to the US, limiting the US role as an integral part of the project.
- Consequently, the US had little or no part in determining the goals of the health component, planning and coordinating information and evaluation requirements, or contributing to site selection criteria. Both US participation and project effectiveness suffered as a result.
- As with the corporations, whatever coordination occurred tended to be purely sectoral, with CARE, and did not contribute to the integration of the various components and the regional institutions involved in the project.
- Similarly, the limitations of the US were not adequately taken into account in defining their role, particularly their ability to train and supervise health promoters after CARE assistance ends.

3.1.2.3 Community Participation Component

The communities also were assigned a counterpart role and expected to participate in planning the project; select community members to serve on water committees as water system operators and health promoters; provide labor and local materials for water system and latrine construction; operate and maintain the water systems; and continue health activities. Some design issues which have affected their ability to take on these responsibilities are discussed below. These are derived from the implementation experience described in Chapter 6.

- Though the proposal and agreements so specify, there was very little opportunity for community input into the planning of the project. The basic outlines of the project had been determined before the communities were contacted and, indeed, before the agreements with the counterparts. Given USAID funding requirements for detailed

project design, this type of "top-down" design is hard to avoid. The community role basically was to comply with agreements defined by CARE and, to a lesser extent, the corporations.

- The construction of water systems throughout the four-year project period meant that communities in which systems were built in the fourth year had no time to test and strengthen their competence in operation and maintenance while technical assistance and backstopping were still available from CARE or corporation personnel. Start-up delays in the project exacerbated this problem, putting more communities than originally planned in this situation.
- Concentrated attention to sustainability came late in the project, further limiting prospects, and the project period was too short to attain maximum sustainability.
- The larger economic context had played an important influence on the ability of communities' to sustain project activities, indicating a need either to look more closely at this factor when selecting communities or to find ways to increase their economic resources.
- Although the coordination of agencies working in health was a responsibility of the US, this was rarely accomplished in practice. Lack of an adequate coordinating mechanism with NGOs in project communities sometimes caused conflicts and affected participation.

3.2 Implementation

3.2.1 Start-up/Project Review Workshop

The start-up of the project proved to be problematic for CARE. The first project manager resigned after four, the second after eight months. After one year major Bolivian staff positions were still unfilled, often because of staff dissatisfaction and turnover. Relationships between CARE, USAID, and the Bolivian counterparts were strained, and USAID was considering deobligating the funds.

In June 1987, USAID and CARE agreed on three steps leading to project review and improvement.

- A joint USAID/CARE project assessment (field visits and a written response by CARE to a number of questions posed by USAID)

- A CARE internal management audit
- A project start-up workshop (*taller de arranque*), also referred to as the project review workshop, to be conducted by independent facilitators from WASH.

The start-up workshop, conducted in October 1987, was attended by participants from USAID, CARE (both La Paz staff and staff from the departmental offices), and counterparts from the departmental corporations and the US. The new CARE project manager (the third for the project) and the next country director (who was to take over in January 1988) were also present.

The workshop was considered to be very successful in enabling the respective agencies to define their roles and expectations and to make plans for project implementation.

The following plan of action was drawn up for the communities:

- Identify communities on the basis of health indicators, need for water supply, size, and willingness to work
- Begin with community selection of water committees, health promoters, and water system operators
- Proceed with core child survival health activities by training village volunteers and organizing each community to build water systems and latrines
- Initiate water system and latrines according to village achievement in health and water components; construction to be primarily by the corporations, using community labor, with CARE supervision.
- Continue operation and maintenance training through the end of the project along with training for continuity in health.

3.2.2 Actual Integration of the Components

There appears to be considerable agreement among regional CARE staff and their counterpart institutions on the degree to which integration of the three components (water and sanitation, health, and community participation) has been achieved. Of the four corporations visited, CORDEPAZ and CORDEOR emphasized the importance of integration and indicated that substantive integration had been achieved. The US in these regions and the CARE staff had a similar view. Although it is hard to tell how sincere this appraisal is,

it probably indicates that considerable integration has occurred, at least in sharing concepts and, to some extent, in translating them into action. Assessing the level of integration achieved at the community level, however, was not possible, given the very few communities visited and the short time spent in each.

In Tarija there was general agreement that an effective level of integration had not yet been achieved, and that coordination occurred mainly within sectors, not among them. The evidence for Potosi was less conclusive, with general agreement that the health and social (community) components were integrated, but that integration of these with the water and sanitation component was still not fully achieved. In Chuquisaca, it was not possible to visit the two counterpart institutions so no firm conclusions could be drawn, though the opinions of CARE staff indicated a similar situation to that of Potosi.

It is evident that recent changes in the priorities of the development corporations under the new government have contributed to increased integration and greater appreciation for the importance of the community participation and health components. However, these organizations are subject to future political shifts in other directions, so long-term progress toward an integrated development approach is unpredictable.

The existence and use of effective mechanisms to bring together the people responsible for the several components are essential to integration. Regular meetings of CARE technical assistants and supervisors are the means most often used. Meetings of cross-sectoral CARE staff and the two counterparts are reported in La Paz and Oruro; it is certainly not coincidental that these regions have achieved a higher degree of integration. Such meetings are deemed most useful if they include operational, rather than only policy, staff. Workshops such as the one held in October 1987 which bring everyone together have been suggested—but not yet implemented—as a regional-level strategy for developing consensus and forging a more integrated approach.

In general, the component most difficult to integrate was water and sanitation because of the strong emphasis on the construction of physical elements and the tendency of those involved to concentrate on engineering and construction problems rather than on adopting an integrated development focus. As noted above, however, this is beginning to change to some degree, both within CARE's staff and the corporations.

Effective integration of project interventions at the community level is essential. It has been difficult to develop and maintain community motivation when there have been undue delays in introducing and coordinating project components. Communities need to see short-term, tangible benefits such as latrines and water, as well as health services such as vaccines and oral rehydration, before they are likely to put much faith in the less tangible benefits of health education and community organization.

In spite of difficulties, it is clear that the concept of integrated development is making progress, and that this pioneer effort is beginning to bear fruit. However, this is a concept that requires constant nurturing, and continued progress will hinge on the priorities of counterpart institutions as well as CARE's efforts.

3.2.3 Project Coordination and Communication

Almost all CARE regional staff and counterparts indicated the need for better coordination, although the degree to which they found lack of coordination a problem varied. Again, CARE and counterpart staff agreed that communication and coordination among the institutions involved in the project were generally effective in La Paz and Oruro, while the other regions faced greater problems in coordination across sectors and among the various institutions.

Those interviewed mentioned a number of specific areas in which greater communication and coordination were needed. Corporations cited the conduct of joint investigations prior to construction and the delivery of materials during construction; more information-sharing on costs and more emphasis on quantification of in-kind contributions; increased intersectoral and interinstitutional planning; and more frequent exchange of project experiences among the five regional corporations.

The US suggested more joint planning by the institutions; more integration of the US into the overall project, including a greater voice in site selection and health interventions; joint training of CARE-supported health promoters and *responsables populares de salud* (US-trained community volunteers); more integration of US auxiliary nurses and CARE promoters; and use of the same information forms and development of a common system for evaluating results.

The regional CARE staff stressed the need for strengthening communication and coordination throughout the project, particularly at the operational level, and emphasized the value of regular intersectoral and interinstitutional meetings and workshops. They also noted the importance of coordination with other NGOs and of avoiding conflicts and duplication at the community level. No formal mechanisms to deal with this problem seem to have been developed, except for the CARE-CARITAS agreement in Sucre. CARE and corporation staff suggested that USAID-funded projects in the same geographic areas should be coordinated to avoid conflicts and maximize development impact.

It was clear that effective coordination, like effective integration of components, requires an intersectoral and interinstitutional mechanism.

3.2.4 Counterpart Performance and Strengthening

The single biggest obstacle to effective implementation cited by CARE staff was the inability of counterpart institutions to perform as planned, an observation corroborated in a number of community interviews. The counterparts themselves recognized their personnel and resource limitations, but noted that they sometimes faced conflicting priorities in trying to carry out their many responsibilities. There was frequent mention of the fact that, as government institutions, they were subject to shifting political winds, had a high turnover of personnel, and faced problems such as delayed pay which often led to strikes or, at the very least, to lowered morale.

These problems affected the performance of the US and the corporations to varying degrees, but, in general, these counterparts fulfilled their responsibilities to the best of their ability, though there were some serious delays, especially in payment of counterpart funds.

A serious deficiency reported was the almost total lack of participation by DSA, which, among other responsibilities, was supposed to provide backup to communities after CARE's intervention ended. DSA's inaction is explained by its institutional weakness and resource limitations, but this has left little or no backup for water system operation and maintenance.

The success of both integration of components and interinstitutional coordination is closely linked to counterpart capabilities and performance. Although institution-building was never a goal of the project, the advantage of promoting effective institutional linkages has become clear. In some ways counterpart limitations can impede project efficiency in the short term. But long-term sustainability requires permanent national institutions able to provide continuing support for community-level activities after external project interventions end. Developing strong community institutions is the key to effective implementation and sustainability, but even the strongest communities may need assistance with technical or organizational problems beyond their own capability.

Furthermore, viability at the community level will depend on the ability of permanent regional institutions to train replacement operators and health promoters after CARE's intervention ends, and to provide at least minimal supervision and support for current and future community volunteers.

The project has had some impact on counterpart institutions, principally in promoting the concept of intersectoral and interinstitutional integration. The US staff members indicated that they intended to incorporate the CARE promoters into their systems on the same basis as their own *responsables populares*, and would continue to provide some training and supervision, as well as vaccines and other supplies. Similarly, the corporations recognized some responsibility to monitor and help maintain water systems. Both the corporations and

the US, however, stressed the problem of resource limitations and the need for external support to carry out these responsibilities effectively.

3.2.5 Changes to the Project Design during Implementation

The most significant changes in project design during implementation were the following:

- The average targeted population in each community was reduced from 400 to 300, reducing the total beneficiary population in the 200 communities served from 80,000 to 59,000.
- The family gardens component, which was to serve approximately 13 percent of the population, was officially eliminated by agreement between USAID and CARE. Nonetheless a significant number of family gardens were developed as a result of the increased availability of water and the continuing promotion of family gardens. (They were still being promoted at the time of this evaluation.)
- The planned per capita water supply of 30 to 60 lpcd was increased to 75 lpcd in the cool highland (*altiplano*) areas and 120 lpcd in the tropical and semi-tropical areas. (However, where the source was inadequate to supply these quantities, a minimum standard of 30 lpcd was applied.) This change resulted in a significantly higher level of service and almost certainly improved hygiene and in some cases micro-irrigation for family gardens. It also significantly increased the cost of the water systems.
- The original plan of follow-up work in each community after completion of the water systems and latrines was largely nullified by the virtual loss of the first year of the project, and the fact that most of the water systems and latrines were not completed until the final year (and in many cases the final months) of the project.
- To partially compensate for this setback, two measures to increase the prospects for sustainability were introduced about a year ago. These were: establishing leaders' councils (*consejos de autoridades*) to bring together and strengthen the planning and coordinating capabilities of community organizations; and teaching promoters the techniques for encouraging community participation and organization.

3.2.6 Project Information System

The project information system collects monthly data from each community on births and deaths, immunizations, growth monitoring, diarrheal incidence and treatment, latrine construction, educational sessions given, and number of mothers trained (measured by their ability to pass a test given by the supervisor in one of the eight subjects taught.) Each month the promoter updates the mother's "road to health" card and a duplicate card kept in the promoter's home. The supervisor then copies the growth monitoring and immunization data into a notebook which contains detailed information on each of the 300 to 400 children in his/her communities. In addition, each promoter submits a calendar report of activities and a monthly report of diarrheal incidence which the supervisor uses to complete seven information forms. The supervisors and technical assistants for health and engineering gather at a monthly meeting to discuss the progress and problems of the communities and to make a schedule for the technical assistants' field visits for the next month.

A chart describing the flow and collection of information can be found in Appendix E along with the instruments used to collect the data.

A computer at the department office stores and prints out all the information from the supervisor's reports and totals the numbers for each department. The system was designed to provide extensive information on each community and is greatly appreciated by the supervisors. However, the system provides too many details and does not aggregate the information for decision making at the higher levels.

The following is a review of the use of health data:

- Mothers need a portable growth, immunization, and illness record that will answer any questions a health provider may have when they seek health care for the child. The mother can also use it to tell if her child needs an immunization and to monitor growth. The "road to health" card is the perfect instrument for this purpose.
- The promoter needs to know which children in his or her community are at risk, either because they need immunizations or because their growth is faltering. The supervisor's notebook is the perfect instrument for this purpose. All the children are listed on a single page. Those missing an immunization or a growth monitoring session can be spotted at a glance and those with faltering growth can be picked out by scanning a single column. If a mother loses her growth card, a new one can be created from the information in the notebook.

- The supervisor needs to know how well each promoter is doing his or her job without knowing every date of every weighing and immunization on each child. By reviewing the notebook with the promoter, the supervisor can calculate percentages of immunization and growth monitoring coverage and compare them with the objectives. The supervisor can then record the accomplishments of each promoter and the at-risk children needing special attention in each community.
- In the same way, the technical assistants need to know how well the supervisors are doing their jobs. Currently some technical assistants spend several days a month consolidating information at the supervisory and departmental levels. The technical assistants in Potosi arrange these totals in pie charts and bar graphs to compare the accomplishments of supervisors. The usefulness of these manual charts versus the computer printouts from which they are created is demonstrated in Appendix E.
- On the national level, the project manager needs to know whether the project is accomplishing its objectives. With the current information system, a great number of hand calculations are necessary to provide the answer. These calculations are marked with asterisks in Chapter 5. Nine pages of computer printout had to be sifted for the information on which the calculations are based because the computer does not aggregate the data.
- On both the departmental and national levels, information must be gathered to support the needs of the US and the Ministry of Health.

3.2.6.1 Analysis of Passive Morbidity and Mortality Reporting

An information system must consider not only the substance and form of data it provides, but also whether this information is valid. Not surprisingly, the CARE information system reports on diarrhea and infant births and deaths are deficient in this respect.

Passive Diarrheal Case Surveillance

The CARE information system reports the incidence of diarrhea at 3 percent per month, while a random survey by the project revealed an incidence of 10 percent and the evaluation survey an incidence of 13 percent in two-week recalls. This is not surprising. Community-based morbidity records are both time-consuming and notoriously underreported, whereas surveys are the internationally preferred method for collecting this information and offer the

additional advantage of being used to evaluate behaviors associated with diarrhea. The project survey revealed that there was no relationship between diarrhea and hygiene training, and enabled the project manager to revise the hygiene training to emphasize hand washing. The evaluation survey revealed that, contrary to the mothers' claim that they use ORS to treat diarrhea, many do not know how to prepare ORS and actually use herbal teas. These important program management facts would not show up in a passive morbidity data collection system.

Passive Vital Statistics Reporting

In the past year, the CARE information system reported 465 births, whereas in the project population of 59,000 with a crude birth rate of 43 births/1000 (State of the World's Children 1990), more than 2,500 births should have been expected. This suggests that only one-fifth of the births are actually being reported. Similarly, the information system reported 42 infant deaths, whereas with an infant mortality rate of 172/1000 live births (State of the World's Children), the project should have been expected to record 420 infant deaths. These findings are not surprising. Accurate passive collection of vital statistics at the village level is universally poor, and CARE is doing as well or better than any other PVO attempting this.

But project reporting can be improved in several ways:

- Pregnancies must be noted and followed to outcome. Most births and deaths are missed by underreporting of early infant deaths. In a country with low tetanus vaccination coverage and few trained midwives, the early infant mortality rate is probably extremely high.
- People need to know why they are collecting vital statistics. Health professionals usually understand the importance of these better than community volunteers and therefore are probably more suited to data collection. A program which plans early visits to the newborn, the presentation of a "road to health" card, advice, congratulations, and support to the mother, and entry in a promoter's roster can improve birth reporting.
- Similarly, supervisors should follow up deaths by offering the family condolences and asking the cause of death. Later discussion with the promoters on how the deaths over the past year or several months could have been prevented will reinforce the importance of reporting and investigating deaths.
- Health professionals should be able to predict the number of births and deaths expected in their area from gross population statistics and

country demographic data. This will improve the accuracy of their collection system until it nears predicted values.

3.3 Cost Overruns

3.3.1 Central Questions Regarding Project Costs

As a result of a \$0.65 million cost overrun, CARE in March 1989 requested an increase in the USAID grant from \$4.5 million to \$5.0 million. This request was approved and at the same time CARE added \$0.15 million of its own funds to the project.

USAID requested that this final evaluation report answer three questions:

- Why was the additional \$0.65 million needed?
- Why did CARE not realize until March 1989, when the project was about two-thirds of the way to completion, that a substantial increase in funding was necessary?
- How can such problems be avoided in the future?

The evaluation team did not attempt to audit or check any of the cost and expenditure information provided by CARE and USAID, limiting itself to an analysis of the justification for these expenditures, and a determination of the reasons why certain information did not appear until fairly late in the project. The three questions are answered in the rest of this chapter.

3.3.2 Project Costs

The project budget totaled almost \$9 million and included a \$5 million USAID grant administered by CARE. Table 1 presents a breakdown of costs per beneficiary for each project component and by source of contribution.

Nearly 29 percent (\$2.6 million) of this budget came from in-kind contributions from the corporations and the communities, about 13 percent (\$1.15 million) from cash contributions from CARE, the corporations, and the communities, and the remaining 56 percent (\$5.0 million) from USAID.

Table 1

COSTS FOR EACH COMPONENT OF THE PROJECT

<u>COMPONENT</u>	<u>APPROX. COSTS PER BENEFICIARY</u>			<u>TOTAL</u>	<u>NO. OF BENEFICIARIES</u>	<u>TOTAL INVESTMENT</u>	<u>PERCENT OF TOTAL</u>
	<u>CARE MANAGED DIRECT CASH</u>	<u>CARE INDIRECT (19%)*</u>	<u>IN-KIND (APPROX VALUE)</u>				
WATER	\$66.10	\$15.50	\$30.00	\$112.00	59,000	\$6,600,000	74 %
LATRINES	\$10.00	\$ 2.30	\$11 00	\$ 23 00	36,400	\$ 840,000	10 %
HEALTH & COMMUNITY ORGANIZATION	\$14.20	\$ 3.40	\$ 8.00	\$ 25.00	59,000	\$1,500,000	17 %
TOTALS				\$160.00		\$8,940,000	100 %

NOTES:

- * 1 THE 19% FACTOR FOR CARE INDIRECT COSTS INCLUDES OVERHEAD AND ADMINISTRATIVE EXPENSES WITHIN BOLIVIA, AS WELL AS THE OVERHEAD FACTOR FOR CARE/NEW YORK.
2. PROJECT COST DATA WAS PROVIDED TO THE EVALUATION TEAM BY CARE/BOLIVIA, AND NO ATTEMPT WAS MADE TO CHECK CARE'S FIGURES (THE EVALUATION TEAM REORGANIZED THE CARE DATA IN THE FORMAT PRESENTED HERE, ROUNDED OFF CARE'S FIGURES, AND MADE A ROUGH ESTIMATION OF THE DISTRIBUTION OF THE TOTAL IN-KIND CONTRIBUTIONS ACCORDING TO PROJECT COMPONENTS).
- 3 ALTHOUGH THE TOTAL COSTS IN THE ABOVE TABLE ARE ACCURATE, THE DIVISION AMONG THE THREE COMPONENTS IS AN ESTIMATE. THE COSTS FOR EACH COMPONENT MIGHT BE ACCURATE TO WITHIN ABOUT 20 PERCENT

The total investment managed by CARE, not including in-kind contributions from the communities and the development corporations, was approximately \$6.3 million, as shown in Table 2.

3.3.3 Justification for Costs of the Water Component

As shown in Table 1, the water systems had an average per capita cost of \$109.00, which represented approximately 72 percent of total project costs. In the opinion of the evaluation team this is reasonable because a high level of service including yard connections and high per capita flows, was provided; all costs (direct, indirect, and in-kind contributions) are included; and the average community size of about 60 houses prevented the economies of scale that might have applied to a larger system.

Table 2
SOURCES OF PROJECT FUNDS

SOURCE	MANAGED BY CARE	AMOUNT	PERCENTAGE
AID	YES	\$5,000,000	56
DEVELOPMENT CORPORATIONS	YES	\$ 930,000*	10
COMMUNITIES	YES	\$ 190,000*	2
<u>CARE/USA</u>	<u>YES</u>	<u>\$ 160,000</u>	<u>2</u>
CARE-MANAGED SUBTOTAL	YES	\$6,280,000	70
* NOTE: FIGURES FOLLOWED BY * DO NOT INCLUDE IN-KIND CONTRIBUTIONS BY THE COMMUNITIES AND THE DEVELOPMENT CORPORATIONS.			
IN-KIND (FROM COMMUNITIES & DEVELOPMENT CORPORATIONS)	NO	<u>\$2,630,000</u>	<u>30</u>
TOTAL		\$8,910,000.	100

The only way in which the cost could have been reduced significantly would have been by reducing the level of service, such as by providing public taps or handpumps instead of yard (patio) connections. However, a reduced level of service probably would have reduced the direct health benefits of the system, because when access is less convenient people tend to use less water and improvements in hygiene are minimized. A reduced level of service also would have probably reduced the impact of new water supplies on motivating the communities to participate in the latrine and health components of the project.

Some cost reductions could certainly have been achieved by better construction management, including more timely arrival of materials, and by improved inventory control which would have avoided the frequent use of oversized piping. The evaluation team did not have the time for a detailed analysis, but an unsubstantiated impression is that the average cost of the water systems might have been reduced by about five to eight percent. However, it should be noted that in communities where the water source could provide excess flows, the use of oversized pipes has resulted in greater flows to the beneficiary households, which frequently applied them to micro-irrigation of family gardens. Such gardens can improve nutrition and thereby improve health, so it should not be concluded that the use of oversized pipes was necessarily a waste of money.

3.3.4 Justification for Costs of the Latrine Component

The average per capita cost of latrines was about \$23.00, approximately \$12.00 from cash and \$11.00 from in-kind contributions from the beneficiaries (labor and local materials). Table 3 shows the materials costs for the five types of latrines the project offered.

Table 3

COSTS OF VARIOUS TYPES OF LATRINES
(excluding in-kind beneficiary contributions
and CARE technical input)

		<u>BENEFICIARY CASH CONTRIBUTION</u>	<u>CARE CONTRIBUTION</u>	<u>TOTAL UNIT COST*</u>	<u>PER CAPITA COST</u>
TYPE A	DRY VENTILATED PIT LATRINE	\$10.00	\$19.50	\$29.50	\$ 5.50
TYPE B	WATER-SEALED LATRINE	\$12.00	\$28.00	\$40.00	\$ 7.00
TYPE C	WATER-SEALED LATRINE W/SINK	\$15.00	\$34.00	\$49.00	\$ 9.00
TYPE D	WATER-SEALED LATRINE W/SINK AND SHOWER	\$18.00	\$49.50	\$67.50	\$12.00
TYPE E	WATER-SEALED LATRINE W/SINK SHOWER & LAUNDRY	\$22.00	\$55.00	\$77.00	\$14.00

* NOTE: AVERAGE OF 5.6 USERS PER LATRINE.

The investment in latrines represented approximately 9 percent of total project costs. Considering the popularity of the latrines and their impact on hygiene and health, this was reasonable. Furthermore, these costs are fairly low when compared with the costs of similar latrines in other countries, including India, Indonesia, Nepal, and the Philippines (D. Duncan Mara, *The Design of Pour-Flush Latrines*, The World Bank, 1985).

Although the project investment for the average latrine was justified, the significantly higher project subsidy for the more expensive types of latrines (Types D and E) is questionable. This is especially true because after making high investments in expensive latrines in some communities, the project had to inform others that the budget for latrines was exhausted and they would have to do without any type of latrine.

3.3.5 Justification for Costs of the Health and Community Development Component

The combined health and community development activities cost an average of \$29.00 per capita, which corresponds to an average annual expenditure of \$7.25 per capita. This represents approximately 19 percent of total project costs. Considering that improved health was a central objective of the project, this is a reasonable investment. However, the evaluation team is not in a position to state whether the same impact could have been achieved for less.

3.3.6 Explanation of the Cost Overrun

The overall explanation of the overrun is CARE's underestimation of the cost of implementing the project, especially in relation to administrative and personnel costs. It appears (without undertaking an audit or an in-depth analysis) that the increase was justified. Specific items originally underestimated are discussed in the following paragraphs. The overrun covered the cost of quality improvements, increased efforts at coordination required by the complexity of the project, and a slow start-up, all of which should have been included in the original budget. Part of the explanation for this omission was that the project was a first experience in integrated programming for CARE/Bolivia. Table 4 shows how the overrun was applied.

3.3.7 Financial Monitoring

The evaluators feel that CARE's financial monitoring controls were inadequate, as discussed in the following paragraphs, and resulted in the tardy realization of cost overruns.

Project funds were transferred from A.I.D./Washington to CARE/New York via a Federal Reserve letter of credit (FRLC), and the balance in the FRLC was apparently the main source of information for monitoring project expenditures. This was a totally inadequate means of tracking the disbursement of funds.

Table 4

ITEMS THAT CONTRIBUTED TO THE COST OVERRUN

ITEM	APPROXIMATE ADDITIONAL COST
A. HIGHER EXPENDITURES ON WORKSHOPS TO INCREASE QUALITY AND COORDINATION (\$55,000 SPENT VERSUS NONE PROGRAMMED).	\$ 55,000
B. SLIGHTLY HIGHER EXPENDITURES FOR WATER SYSTEM AND LATRINE MATERIALS (\$2,400,000 SPENT VERSUS \$2,225,000 PROGRAMMED). 6,500 LATRINES WERE BUILT AT AN AVERAGE MATERIALS COST OF \$34.00 EACH, INSTEAD OF THE PROGRAMMED 5,000 LATRINES AT AN AVERAGE COST OF \$23.75.	\$ 175,000
C. EMPLOYING 45 FULL-TIME FIELD SUPERVISORS FOR TWO YEARS, INSTEAD OF 28 FULL-TIME AND 18 AT 25 PERCENT-TIME (\$351,000 SPENT VERSUS \$232,000 PROGRAMMED). *	\$ 119,000
D. EMPLOYING 20 FULL-TIME TECHNICIANS (HEALTH TECHNICIANS, WATER TECHNICIANS, ETC.) AT A SALARY OF APPROX. \$475 PER MONTH, INSTEAD OF 12 TECHNICIANS, OF WHOM ONLY 3 WOULD BE FULL-TIME, AT A SALARY OF \$425 PER MONTH (\$247,000 SPENT VERSUS \$113,000 PROGRAMMED).	\$ 134,000
E. PARTIALLY COVERING THE COST OF A HEALTH TRAINING AND INFORMATION SPECIALIST (\$25,000 SPENT VERSUS NONE PROGRAMMED).	\$ 25,000
F. ADDITIONAL ADMINISTRATIVE (INDIRECT) COSTS. (TOTAL FOR 3 YEARS FROM MID-1987 THROUGH MID-1990 WAS \$446,000 VERSUS APPROX. \$300,000 PROGRAMMED).	\$ <u>146,000</u>
TOTAL:	\$ 654,000

* NOTE: IN THE FINAL YEAR OF THE PROJECT, THE SUPERVISORS WERE REPLACED BY CONSTRUCTION PERSONNEL IN ORDER TO COMPENSATE FOR AN INADEQUATE NUMBER OF CONSTRUCTION PERSONNEL PROVIDED BY THE DEVELOPMENT CORPORATIONS.

The FRLC balances reported at three-month intervals were as follows:

<u>Date</u>	<u>Balance *</u>
10/31/87	\$ 3,359,500
4/30/88	\$ 1,905,900
7/31/88	\$ 1,762,500
10/31/88	\$ 1,438,464
1/31/89	\$ 1,315,006
4/30/89	\$ 790,900
7/31/89	\$ 361,281

* Note: The balances reported are based on FS269 forms.

A casual look at these balances would not have alerted project management at any point in 1988 to the fact that funds were being overspent. The main problems with using these balances as a monitoring tool were that the FS269 forms took several months to reach Bolivia, and that they aggregated all expenditures, providing no breakdown by line items to show management where certain line items were exceeding the budget. In effect, until recently, project management was working blind in regard to where it stood financially and USAID had no better information.

As of late 1987, without even having received the FRLC balance for 10/31/87, CARE and USAID believed that the project had not yet spent any significant amount of money. The newly arrived CARE country director and project manager did not know that an import order for about \$950,000 of pipe had been placed, nor did USAID/Bolivia, until the pipe suddenly appeared! They were not alerted to this by the FRLC balance information until they saw the dramatic drop in the balance for 4/30/88, which reached them in the latter half of 1988. Thus, it was not until CARE staff reviewed the financial status of the project in early 1989 that they realized they were heading towards a major cost overrun and requested funding from USAID to cover this.

In addition, for much of the life of the project, counterpart contributions ran 12 to 18 months behind schedule. In April 1989, over \$500,000 of counterpart obligations had not yet been received by CARE in spite of written agreements to the contrary. While the situation was rectified late in the project, the accelerated drain on USAID monies contributed to a significant cash-flow problem.

There are several conclusions to be drawn from this to ensure adequate financial monitoring control:

- The FRLC balance should never be depended upon as an indicator of the funds still available.

- The original budget for any project should always provide enough detail for project management to later determine whether or not expenditures are running as anticipated. This information need not necessarily be included in the line item budget presented to USAID but can appear as an annex to the proposal, with an indication of the basis for the line item figures in the general budget.
- Counterpart contributions should be received in as timely a fashion as possible in order to facilitate adequate cash flow.
- Project management must always have a locally managed system for monitoring and controlling expenditures. Such a system should not only include disbursements of funds, but should also reflect funding commitments such as orders that have been placed or for which bids have been solicited.
- The key factor for keeping a project on track financially is the project management team's access to timely and complete information summaries.
- One good way to ensure that local project management and the USAID Mission have up-to-date financial information would be to arrange for funds to be transferred by the Mission to the local CARE office instead of by A.I.D./Washington to CARE/New York.
- The USAID Mission may decide that it should have some or all of the information available to CARE project management staff. This would no doubt help USAID evaluate the status of the project, but the evaluation team abstains from stating whether this should be a requirement or not.

CARE/Bolivia has recently instituted a computerized system referred to as budget expenditure control (BEC) that provides a monthly analysis of cumulative budget expenditures. Although CARE is already using this system, it is still being perfected. The evaluation team reviewed the data and analysis it yielded, and concluded that, when it is used with discretion by a knowledgeable project manager, it can provide most of the financial monitoring control needed. The CARE country director believes the BEC system as it presently exists can solve 80 percent of the financial control problems, and intends to continue improving it.

Chapter 4

WATER AND SANITATION

4.1 Design

4.1.1 Design of Water Supply Systems

The technical design of water supply systems has generally been good, following engineering norms and national standards.

The most notable question concerns the disinfection systems for those water sources that are bacteriologically contaminated. Although relatively simple chlorinators have been designed, they may not be appropriate because of the need for a constant supply of chemicals and for training (and convincing!) an operator in the community, and because such systems generally have a history of being abandoned in rural communities elsewhere in the world. Slow sand filters would have been a better choice for water purification.

An occasional exception to the generally good quality of system design concerns water pressure. Some systems permitted excessive pressure in lower areas of the communities, increasing the likelihood of pipe ruptures and leakage. A more common problem was that systems permitted inadequate pressure in higher areas of the communities at times when there is an inadequate water supply or when other parts of the community withdraw excessive quantities (such as for micro-irrigation). These problems frequently could have been avoided by designing around "pressure zones" in each community.

4.1.2 Design of Latrines

Five basic types of latrines were offered by the project (see Section 3.2.5), each with a different level of service. These were a basic dry ventilated pit latrine (also called the ventilated improved pit (VIP) latrine) and four variations of water-sealed latrines with varying types of amenities, such as sinks and showers. In addition to these five basic types, the project experimented with modifications to the water seal and other components. Although the project generally referred to sanitation facilities as "latrines," some of these were actually bathrooms with flush toilets, sinks, and showers.

The design of the most basic and lowest-cost latrine, the dry ventilated pit latrine, has often proven to be inadequate and unpopular, although design modifications of such latrines in some communities have improved them. One problem is that, until recently, the design did

not clearly show that the vertical ventilation pipe must have no bends or curves in it and must be left open at the top except for a fly screen.

The design of the pour-flush water-sealed latrines has been very functional and very popular, except in one respect. Some of the water seals require as much as 15 liters of water for flushing—a significant waste, especially in communities with limited supplies. There are pour-flush latrines that require only one to five liters and CARE management has sent designs of these to its field engineers, but they have not always been used.

A final point regarding the latrine designs is that the ones with the most amenities were relatively expensive.

4.2 Implementation

4.2.1 Water System Construction

4.2.1.1 Community Selection

In general, the selection of communities was consistent with project objectives and the feasibility of construction. The selected communities all had a significant need for water systems.

An exception was that several communities were selected where the only technical option was motorized pumping. They were not always able to pay the water fees for operation and maintenance, and to ensure that both preventive and repair maintenance was done.

Communities were generally selected where there was reasonable access by dirt road (although in some cases these roads were not passable during parts of the rainy season). This generally facilitated project construction and supervision.

Communities were generally fairly nucleated, again facilitating construction.

4.2.1.2 Water Site Selection

The best available water source was generally selected, taking into consideration distance, quantity, and quality. Unfortunately, in some communities the best available source provided either a minimal quantity or a poor quality of water. Nonetheless, based on the information collected by the evaluation team, it seems that most sources provide a reasonable quantity

of water, of a quality that meets the World Health Organization (WHO) guidelines for rural water supplies.

4.2.1.3 Water Quality

Water system quality was usually excellent where the source was an unpolluted mountain spring. It was generally the best that could reasonably be achieved where the source was a river intake. Although river systems typically had de-sanding or sedimentation tanks, the water reaching the yard taps was frequently slightly turbid and the bacteriological quality was questionable. (Nonetheless the bacteriological quality was likely to be better than that of the previous traditional sources used by the community.)

Most water sources were tested during the project for bacteriological contamination, and in many cases some testing was also done for physical and chemical quality, including turbidity, odor, and pH.

According to the CARE project manager, the bacteriological test results referred to concentrations of "total coliform" bacteria per 100 ml of sample water. However, in the laboratory reports reviewed by the evaluation team, the bacteriological test results were not clearly identified, insofar as they generally referred to "numbers of bacteria" per 100 ml sample, or "numbers of coliform bacteria" per 100 ml sample. In fact, there are three standard tests for bacteriological quality: fecal coliform bacteria (this is the most appropriate test); total coliform bacteria (also a reasonable indicator); and total "plate count" for a wide variety of bacteria.

The reported numbers, which tended to be between 1 and 10, generally corresponded to a quality that meets WHO guidelines for rural water supplies. That is to say, most sources were very mildly contaminated but almost certainly less so than typical traditional water sources such as open wells, mud-holes, and streams passing through populated areas. Occasionally sources were seriously contaminated with high concentrations of bacteria: three systems had test results between 30 and 60, and three had test results over 100.

A further consideration is that throughout the world water analysis laboratories are notorious for providing inaccurate test results. They have a bias towards overstating the contamination of water, frequently because equipment contaminated from previous tests and not properly sterilized will show exaggerated levels. Thus it is possible that actual levels of contamination may be less than reported. It is therefore worthwhile occasionally to check the reliability of water analysis. (This can be done by submitting two samples from the same moderately contaminated source, one of them diluted by a factor of ten with sterilized water, and seeing whether the laboratory correctly reports that the diluted sample has one-tenth the contamination level of the undiluted sample.)

A serious shortcoming of the bacteriological tests was that, until recently, they were not accompanied by a sanitary survey, which would have identified the cause of the contamination and perhaps suggested a way to eliminate it. Instead, it was simply assumed that the best way to deal with contaminated water would be to chlorinate it.

4.2.1.4 Construction

Construction quality was generally good. However, because of frequent delays in delivery of galvanized steel pipe, PVC pipe was used in exposed areas bridging gullies and streams. However, at the time of the evaluation, many such plastic pipe spans were being replaced by galvanized steel.

Water quality was inconsistent when the only available source required motorized pumping. The evaluation team did not inspect enough such systems to come to a general conclusion regarding their quality; one they visited had no technical problems and appeared to be well designed and constructed, another was not functioning.

4.2.1.5 Community Acceptance

Community acceptance of the water systems has generally been enthusiastic. Water is certainly the most important benefit of the project in the eyes of the communities. This is not to deny that there have been problems and disappointments when the water supply did not meet community expectations. This is inevitable with newly completed or still incomplete systems. However, it must be remembered that these were observed five months before the project was due to end, and most problems should be amenable to correction by then.

The status of the systems in the 20 communities visited was as follows:

- Ten had been completed and were delivering enough water to meet community needs
- Four were still under construction
- Six had problems, including breakdowns, a broken pump or, more seriously, inadequate sources which required rationing of water.

There were a few cases in which communities were unhappy with CARE's collaboration. One had problems with a burned-out pump and with a delay in tapping an alternative source. Another was at odds with a neighboring community which CARE had promised to include in the same system. In a third there was a serious misunderstanding with CARE over

tapping an additional source. Several communities also reported long delays in getting materials, though they were still very happy to have their water systems.

4.2.1.6 Administration

CARE's administration has generally been very good, with the exception of the first year of the project. The evaluation team was very impressed with the caliber of the CARE staff in all departments served by the project.

A notable administrative problem was the delay in delivering construction materials to the communities, complicated by the need to import most materials. (The evaluation team was informed that imports were dictated by the high price of locally available piping and by USAID guidelines.) Delays in delivery were also responsible for delays in the payment of counterpart funds by the development corporations to CARE, which managed such funds.

The project had four national managers over a four-year period, which could have disrupted smooth project administration. However, there was no indication that this was so.

A clearer delegation of authority might have been beneficial, but the evaluation team was in no position to assess this. At least one field administrator complained that his work was complicated by what he claimed was a general understanding that any administrative personnel in La Paz were considered to have authority over any management personnel in the field.

In spite of these shortcomings, project staff did a remarkable job of turning around the project from its abysmal performance during the first year (when a different management team was in place) to a generally very good performance for the remaining three years.

4.2.1.7 Fees for Construction and Water System Connections

Beneficiary households were charged "up-front" connection fees to cover the cost of their yard taps. Although the project proposal made no mention of such fees, the evaluation team considered them appropriate. Beneficiaries would be more likely to value and maintain their water facilities, and the fees also lowered the per capita investment, thereby permitting the available funding to serve more people. Most potential beneficiaries were able to pay the fees. A very few families could not and had to be excluded.

4.2.1.8 Completion Progress

At the time of the evaluation in March 1990, it appeared that all water systems would be complete by the end of the project in July. However, a disproportionate number had either been completed recently or were nearing completion. This bunching near the end of the project is unfortunate because it limits the opportunity for follow-up corrective actions and for health education interventions complementing the new water supply and sanitation facilities.

4.2.2 Latrine Construction

4.2.2.1 Latrine Types

Latrines were generally constructed in a solid, reasonably permanent, and attractive manner, consistent with their designs. Of the five types offered, the only type for which the evaluation team noted frequent construction shortcomings was the Type A dry ventilated pit latrine, also known as the ventilated improved pit (VIP) latrine. The vertical ventilation pipe was frequently found to have curves in it, and too often the top was covered in some manner. In some communities the hole in the squatting slab was large enough to keep families from allowing small children to use it for fear they might fall in. When this type of latrine was incorrectly constructed, it generally gave off offensive odors, sometimes attracted flies, and was unpopular with the users. However, in other locations the evaluation team inspected, properly constructed latrines of this type had no problems.

The water-sealed latrines often were designed to require as much as 15 liters per flush, compared with alternative designs which require only about 3 liters. It should be noted that, prior to the evaluation, project management had recognized these problems and taken steps to avoid them in the future.

4.2.2.2 Fees

The fees charged to community residents for latrines ranged from B. 20 to B. 65, depending on the type selected. The residents interviewed seemed to consider these fees reasonable and a good investment, though there was less satisfaction with dry latrines. Some families had invested considerably more, sometimes several hundred bolivianos, to improve their latrines, installing such conveniences as electric water heaters for their showers.

The fact that the fees covered only about one-third of the cost of the sanitation facilities meant that the project had to pay more for those who requested more luxurious facilities (see Section 3.3.4). This was an inequitable use of project funds that eventually exhausted the

budget for sanitation facilities and left many water system beneficiaries without latrines of any kind. Despite this, the project was able to provide more than the 5,000 latrines it had originally programmed, responding to a receptivity and enthusiasm for latrines it had not anticipated.

4.2.2.3 Community Acceptance

The acceptance and use levels for latrines were uniformly high, the only problems expressed being with the dry latrines. One informant was particularly vehement about being forced to pay for a dry latrine that had a bad odor problem. He was resentful because he said he had to install it to get water, but that it was no good. However, nearly everyone else said the whole family used their latrine. Some women said they trained their children to use the latrine as soon as they could walk.

4.2.3 Water System Maintenance

4.2.3.1 Community Organization

The basic community organization for both water system construction and maintenance is the water committee (*comite de aguas*), though a few communities have used different committees for construction and for operation or appointed a separate committee to collect and manage tariffs. Two of the communities visited had formal water cooperatives. The committee usually consists of all the families with house connections and has a directing body (*directiva*) of three to nine persons (the range in the communities visited), with the usual number being about five. The committees meet weekly, monthly, or, in some communities, when necessary. The usual responsibilities of the water committees or their directing bodies are collecting water fees and overseeing cleaning, maintenance, and repairs by either the operator or committee members. In some cases local authorities or the leaders' councils have an oversight role over the water committee. The committees in many cases have already bought tools and in others are planning to, using tariff funds. Among the 20 communities visited, six paid their operators either for each day of work or a set amount per month. (This does not mean that none of the others paid their operators, since the question was not asked in all cases.) Some communities do not pay their operators, and in some of these the operators indicated they would not continue indefinitely with this responsibility.

4.2.3.2 Fees and Collection System

The directing body (most often its treasurer) usually collects and manages the water fees (*tarifas*) paid by the members. In some cases a separate administrative committee or other official is given this responsibility. The monthly fees ranged from B.1 to B.4, with the most common being B.1 to B.2. Sometimes lump sum fees are collected, usually to buy tools or needed materials. In the communities visited, the fee collection system appeared to work well; most people considered the fees reasonable and paid them regularly. The only problems reported were in a system where water was often lacking and strictly rationed. This was a pumped system which required higher fees than the community was comfortable with.

4.2.3.3 Maintenance Equipment and Materials

The project had intended to supply each community with a tool kit (wrenches, pipe threader, etc.) before construction was completed. But these kits were being imported and at the time of the evaluation had not yet arrived. For typical gravity-flow systems, most communities, with some difficulty, had used their own funds from user fees to invest in a partial set of tools. This would have been a workable solution except for two problems: there was no money for tool purchases during the first months of system operation because the communities did not begin collecting funds until the systems were complete; and the pipe threads were of a U.S. standard not available in Bolivia.

In some cases the project had left behind a small quantity of imported pipes for use in repairs. It plans to leave spare pipes in all of the communities once construction is completed. However, communities that had to purchase pipes from the local market often found it difficult to connect these to the imported pipes because of different thicknesses and different threading standards (in spite of the fact that Bolivia uses U.S. standards for pipe diameters).

4.2.3.4 Water Treatment

The evaluation team did not visit any communities that had installed systems for the bacteriological treatment of water. In most locations where the project intends to install such systems, this has not yet been done. Therefore the evaluation team cannot state how in fact such systems might be maintained, but can predict that after promoters from CARE and the development corporations have stopped visiting such communities the chlorination systems planned for installation will fall into disuse. A bacteriological treatment system with a greater possibility for continued maintenance would be a slow sand filter, but the project has not

installed any of these. However, partly in response to the evaluation team's recommendation, CARE is planning to hold a workshop on slow sand filters in June.

In locations where the water source was turbid, the evaluation team inspected simple de-sanding and sedimentation tanks the project had installed. In all cases the community water system operators were maintaining these properly. Generally nothing more than periodic cleaning of the accumulated sediment is required.

4.3 Achievements

4.3.1 Sustainability of the Water and Sanitation Facilities

4.3.1.1 General Sustainability

Almost all of the water and sanitation facilities constructed by the project can be expected to remain operational for at least their 20-year design life, with the following exceptions:

- Water supply systems dependent on motorized pumping may fall into disuse because of either technical problems or a lack of funds for operation and maintenance.
- Chlorination systems will probably fall into disuse for any or all of the following reasons:
 - They require a constant and reliable supply of chemicals.
 - The community must remain convinced of their value.
 - They require properly trained operators who must also be convinced of their value.
 - If the chlorine dose is set too high, users will object to the taste.
 - If the chlorine dose is set too low, it will not purify the water.

- If the operator is allergic to the concentrated chlorine he must work with, he is likely to stop maintaining the system.

4.3.1.2 Training and Performance of System Operators

Operators interviewed by the evaluation team generally expressed confidence in their ability to maintain and repair the systems, and stated that the intensive two-week training course they had attended had been very worthwhile. Nonetheless, many operators stated they would benefit from additional training.

A possible exception to this general statement is that the operators of systems that require motorized pumping may not be fully qualified to keep these systems functional. However, the evaluation team did not inspect enough of these to come to a conclusion.

A question for the future relates to the training of operators to replace those who might leave. For simpler systems (the majority), the communities are likely to find some way to keep them functional, if not to operate and maintain them optimally. But without an ongoing training program, complicated systems (such as pumped or chlorinated systems) are likely to have serious problems, and even the simpler systems are likely to have minor problems that are not attended to. The project has encouraged operators to train replacements before they leave, but it is still too soon to determine if this will be adequate.

4.3.1.3 Training and Performance of Village Water Committees

The village water committees were generally well organized and performed their tasks adequately. They saw their main responsibilities to be the construction of the systems, supervision of the operators, and collection and management of the monthly water fees (see Section 4.2.3.1).

4.3.1.4 Existence and Adequacy of Backup Systems for Water and Sanitation Maintenance

Backup systems were hard to find. The ability of the corporations to provide these is doubtful, and the lack of backup capacity for operation and maintenance is a concern. Nonetheless, it can be reasonably assumed that the communities will find a way to keep the majority of the simpler systems functioning.

4.4 Conclusions

The overall conclusion was that the water supply and sanitation components of the project were very successful and worthwhile. More specific conclusions were as follows.

- Gravity-flow systems with mountain springs as their source have performed excellently.
- Gravity-flow systems with river intakes as their source have been well designed and constructed but provide slightly turbid water (at least during the rainy season) and often have moderate and occasionally high levels of bacteriological contamination.
- The performance of systems which required motorized pumping has been inconsistent. The cost of operation and maintenance has been a serious problem for some communities.
- Although there was no opportunity to inspect any chlorination systems, since most have not yet been installed, the evaluation team made the tentative conclusion that these are unlikely to be adequately maintained over the long term, and that slow sand filters might be a better alternative for bacteriological treatment of contaminated water.
- The latrine program has been exceptionally successful and popular with the villagers, who favor the pour-flush water-seal latrines. Dry ventilated pit latrines have often had odors and been unpopular, partly because of improper installation of the ventilation pipe.
- During much of the project implementation period, inadequate attention was given to discouraging wastage of water. This applied particularly to the use of pour-flush water-seal designs that required excessive quantities of water for flushing. More recently, project management has urged their engineers to use water-conserving designs, but it would seem that a workshop or seminar might be needed to convince the engineers that this is important.
- The systems are frequently used for micro-irrigation, although this was not originally envisioned.
- Some systems have problems with inadequate pressure, so that those community households at a higher elevation often receive water only during part of the day.

- Some systems have problems with excessive pressure at the lower elevations, and this has resulted in burst pipes and leakage of water.
- Communities are generally well organized for system maintenance, and adequate maintenance is generally being done, except on some motorized pump systems. However, the lack of a backup system is of some concern.
- Project administration, except for the first year, has generally been very good.
- The specified number of 200 water supply systems is being completed during the project. But largely because of poor administration during the first year, the work was not optimally phased and most systems are being completed very close to the end.

Chapter 5

HEALTH EDUCATION

5.1 Design

The project was designed so that two health promoters chosen by each community would receive an initial short training reinforced by supervisors living in the community for three days each month. The supervisors are full-time CARE employees fluent both in Spanish and the local language, and are nurses or auxiliaries trained in the Bolivian educational system. They typically spend the first 20 days of each month in the seven communities for which they are responsible, traveling from community to community on motorcycles. The next two days are spent filling out forms for the information system, and on the following day they attend a meeting where supervisors and technical assistants discuss problems and make plans for the following month.

Each department has a technical assistant, a Bolivian doctor employed by CARE to supervise and be responsible for ongoing training and support of the supervisors. This person is also the liaison with the US at the departmental level and with the CARE technical assistant for water and sanitation, a Bolivian engineer.

The health training was designed to accomplish the following objectives, as revised in December 1989, by the end of the project:

- 90 percent of target area mothers with children aged four and under (6,800 mothers) should know when and how to rehydrate children suffering from diarrhea.
- 75 percent of target area children aged four and under suffering from diarrhea within the previous two weeks should have been correctly rehydrated.
- 80 percent of children between nine months and 5 years (6,000) should have had immunization for tuberculosis, measles, polio, pertussis, tetanus, and diphtheria.
- 200 permanent, community-level child health programs should be functioning, with emphasis on ORT, immunization, growth monitoring, and nutrition practices.

- 70 percent of the target area population (42,000 persons) should be using iodized salt or should have received iodine capsules or injections.

5.2 Implementation

5.2.1 General Overview

The project was basically implemented as designed. However, to increase immunization coverage, the supervisors would depend on the US to travel to communities and vaccinate the children between the regular campaigns. (Vaccination campaigns generally are planned by the US three times a year.)

There was no plan for phasing out the supervisor role in the communities. However, because of budget constraints, 13 of the supervisors were transferred to another project in February 1990 and the remaining 16 took responsibility for all of the communities.

5.2.2 Health Education

5.2.2.1 Educational Materials

The materials available for review by the evaluation team were:

- Initial and secondary course outlines for promoters and operators
- CARE materials used by the Potosi supervisors
- Ministry of Health manuals for promoters
- Sheets describing the eight messages promoters use in the communities and guidelines for the test for mothers

The course outlines included lectures on the health topics the promoters needed to know, an introduction to the information system instruments with practice sessions in using them, and techniques of demonstrations, sociodramas, and group discussions.

The Potosi staff used pictures to promote group discussion in the communities and the book *Helping Health Workers Learn*. They also created a manual for promoters with pictures and simple wording covering all the topics the promoters were required to know and teach.

The three Ministry of Health manuals covered immunization, acute respiratory infection (ARI), and antenatal care. Except for minor deletions of topics considered to be important (noted in the following discussion of each topic), the materials seemed to cover the educational needs of the promoters adequately.

The only training materials found in the communities were posters from the Ministry of Health, CARE, Caritas, and UNICEF, and hand-embroidered cloths with some of the eight educational messages taught to the communities.

5.2.2.2 Training in the Communities

Only one training session, a lecture on foods in the three food groups, was observed in the communities. The promoter used three embroidered cloths with pictures of the foods in each group and pointed to the food while she lectured. Then she asked the women to name the foods. This type of lecture (*charla*) was the type of educational session most often given in the communities.

5.2.3 Health Promoters

5.2.3.1 Selection

All the promoters interviewed had been selected by their communities. Many stated that there had been no competition for the position.

5.2.3.2 Training

In addition to the two courses mentioned in Section 5.2.2.1, most of the training was done by the supervisors while living in the communities. This on-the-job training was the most valuable and probably responsible for the great successes seen in the communities. All promoters stated that training by the supervisors had been adequate, but almost all stated they would like to have more, e.g., in how to give immunizations.

Although promoters were trained in demonstrations and sociodramas, these methods do not appear to be used much.

5.2.3.3 Supervision

A possible problem area is supervision during the phaseout period as the project nears completion. All promoters have been supervised according to the plan described in Section 5.1, and all those interviewed believed the supervision to have been adequate until February 1990. The transition period for the phaseout of supervisors occurred in January. The supervisors who were being transferred introduced their replacements to the community leaders, operators, and promoters when possible, or only handed over a list of names. Many promoters expressed a feeling of abandonment by the supervisors with whom they had built up a relationship. The remaining supervisors expressed a feeling of being overwhelmed by their new responsibilities and of finding it difficult to establish relationships with the new communities.

5.2.3.4 Incentives

The incentives most often cited by the promoters were: enjoying training in health; enjoying knowing that because of their work the children were healthier; wanting to be a part of the development of the community; and enjoying teaching. Except for communities in which the health promoters also worked as water system operators, there was no financial benefit from their work.

5.2.3.5 Community Acceptance

Seventeen of the 20 promoters interviewed believed their work was valued by the community. Of the three who did not, two were men and one a woman. They all stated they had difficulty getting the women to come to the regular meetings. One man did not know why the women didn't come. The woman promoter said her community was one of the last to get water and that water was the incentive she had used to encourage women to come to the meetings. After four years without water, it was difficult to convince them. (CARE staff stated that this had been one of the most difficult communities to organize, and therefore it was one of the last to receive water.) The second man stated that men were supportive, as evidenced by the fact that almost all came every month to a meeting where they discussed the progress and problems of the water system construction and maintenance. Every week he held talks for the women – the women's meetings were always talks, never demonstrations, practices or discussions. Only 25-50 percent of the women would come even though he fined them 50 centavos (\$0.15) each time they missed and turned off their water if they didn't pay.

Each community decides how it will maximize participation in the educational sessions. Most fine a family for not coming. The sessions were either weekly or bimonthly, again decided by the community. Several women who exhibited excellent knowledge in the home visits

said they had stopped going to the meetings several months to a year ago – now they send their husbands to avoid the fine.

5.3 Achievements

5.3.1 Accomplishments

5.3.1.1 Immunizations

Objective: 80 percent of children between nine months and 5 years (6,000) should have been immunized for tuberculosis, measles, polio, pertussis, tetanus, and diphtheria.

According to CARE's information system, the following numbers of children (hand calculated from information system report) had completed their vaccinations by February 1990.

<u>Department</u>	<u>Children Under 5</u>	<u>Total Vaccinated</u>	<u>Percentage</u>
La Paz	1,225	808	66
Chuquisaca	575	351	61
Tarija	1,031	647	63
Oruro	589	346	59
Potosi	1,044	823	79
Totals	4,464	2,975	67

If 25 percent of the total number of children is discounted for children under nine months, who could not be fully vaccinated, the estimated numbers for children between 10 months and five years would be:

Total 10-59 mo. (estimate)	3,348	2,975	89
-------------------------------	-------	-------	----

A random survey by CARE in June 1989 revealed 93 percent with completed immunizations, and the survey by the evaluation team (not a random sample—see Section 1.4) revealed 70 percent. Therefore, CARE has exceeded its objective for immunization. Moreover, the mothers interviewed expressed a strong desire for vaccinations and credited the reduced number of illnesses in their children to them.

5.3.1.2 Oral Rehydration Therapy

Objective: 90 percent of target area mothers with children four years and under (6,800 mothers) should know when and how to correctly rehydrate children suffering from diarrhea.

Objective: 75 percent of target area children four years and under suffering from diarrhea within the previous two weeks should have been correctly rehydrated.

All of the mothers and promoters interviewed believed that children had less diarrhea now than at the beginning of the program. Some attributed it to the water system, others to improved hygiene resulting from the availability of water, and others, without water systems, solely to health education. As can be seen from the following analysis, it would be difficult to determine exactly how much diarrhea has decreased.

The numbers, hand calculated from the information system reports for November 1989 to February 1990, are:

<u>Month</u>	<u>Total <5</u>	<u>Cases of Diarrhea</u>	<u>Prevalence</u> (percentage)
November	6,673	226	3
December	7,016	226	3
January	6,057	191	3
February	5,638	198	3

All of the reported cases were treated with ORT, using either ORS or suero casero.

The information system does not explain why the number of under fives varies by over 1,300 in this period. It could be the result of migration, but could also be an error.

A random survey conducted by CARE in June 1989 revealed a 10.2 percent prevalence of diarrhea, and the survey conducted by the evaluation team revealed a prevalence of approximately 13 percent. This would suggest that the cases of diarrhea are underreported and that mothers are treating the diarrhea at home without informing the promoters. There is no way of knowing what treatment they are using.

Practice of ORT is much more difficult to implement and to evaluate than knowledge of ORT. The classic study by BRAC in Bangladesh showed that after intensive house-to-house ORT training the majority (over 70 percent) of mothers could explain ORT but only about 10 percent used it. There are many reasons for this, the most obvious being that it is more difficult to effect a behavior change than to teach health-promoting behavior. (For example, very few smokers in the United States continue to smoke because they do not know the

effects of smoking on health.) But there are also more subtle reasons. In many languages, there are many words for diarrhea (Aymara has approximately 20). In Nepal, where use of ORT was found to be very low despite an extensive social marketing campaign, research revealed that the word used for diarrhea in the campaign was the term for a very common but mild diarrhea which mothers knew would go away by itself. When the campaign changed to a word that signified a deadly type of diarrhea, ORT use increased. Other campaigns have suffered because the word used for diarrhea described a type brought on by spells or witchcraft or evil spirits, and promotion of ORT did not deal with the cause as the people saw it.

In the evaluation survey, 100 percent of the mothers interviewed understood they had to continue feeding and breastfeeding during diarrhea. Fifty percent of children with diarrhea in the previous two weeks had probably been treated properly with ORT. Twenty out of 50 mothers prepared it correctly. However, few had the utensils they needed to prepare it correctly. Mothers went to neighbors to find teaspoons and liter measures. Seven tried to prepare it, but either used the wrong measure for a liter, or a heaping teaspoon of salt which approximated two teaspoons, or a tablespoon. Of the 23 who could not prepare it, five, all from Tarija, admitted they did not know how to, and stated that when their children had diarrhea they went to the health center for pills. The promoters from these two villages agreed that pills were best for diarrhea and said that carbon tablets and chloramphenicol were most often prescribed. One mother stated that she would only give rice water for diarrhea as her daughter would not drink ORS. The others verbally gave the correct recipe, but looked horrified when asked to prepare it and admitted that they did not know how, and that they really used a traditional herbal tea (*mates*) when their children had diarrhea.

ORT is proper feeding of ORS during diarrhea. That 100 percent of the mothers insisted they continued feeding and breastfeeding during diarrhea and that 40 percent probably used ORS correctly when a child had diarrhea are amazing accomplishments in the context of ORT use in the world. If children with mild, or even moderate, diarrhea are given enough food, breastmilk, and other liquids so that they do not become dehydrated, they do not need rehydration solutions. Although CARE probably has not achieved its objectives for ORT, it is more likely that the objective is unrealistic and that the program is to be praised. Suggestions for further improvement were made by many of the CARE staff and will be included in the recommendations section.

5.3.1.3 Growth Monitoring and Nutrition

The objective for growth monitoring was dropped when the objectives were revised in December 1989. However, it was an important activity and was evaluated.

The information system reported the following numbers of children (hand calculated from the report) weighed each month:

<u>Month</u>	<u>Children <5</u>	<u>Children Weighed</u>	<u>Percent*</u>
November	6,673	4,406	66
December	7,016	4,502	61
January	6,057	3,823	63
February	5,638	3,934	69

In the evaluation survey, 85 percent of the children visited had been weighed in the past month. As stated in Section 1.4, this number reflected the children closest to the community center where the children were weighed and mothers who were most likely not to be working far from home.

Mothers said they liked going to the weighing sessions to see what color yarn they would get on the card. They also reported that the nutrition education sessions helped them to understand what foods the children needed, and that they were adding more vegetables and proteins to their children's diets. They had learned to associate weight loss with illness and danger, and were responding by forcing more food on the anorexic child after illness.

The growth monitoring cards reviewed in each village were maintained to a perfection never before seen by the evaluator. Every space, including the information on illnesses, breastfeeding, starting of solid foods, and new pregnancy in mothers, was filled in. Every month was neatly marked at the bottom of the card and the weights were carefully connected by dots.

All of the mothers were observed to be breastfeeding well into the second year of life, usually quitting only for pregnancy. Only one milk bottle was seen during the entire field survey, and the mother was quick to show us that she was using it only for feeding an orphaned llama.

Observation of one growth monitoring session (and of growth monitoring equipment in several communities) revealed the following:

- The mothers and promoters were conducting the entire session themselves with little assistance from the supervisor.
- The session was being held in a new building for the mothers' club. The scale was not hung but pulled up manually by the mother once her child was in the weighing pants. After five children had been weighed in this manner, the supervisor brought a beam into the

center and tied the scale to it. Rather than being rested on a solid surface, the beam was raised and lowered to get the child off the ground. An attempt was made to stabilize the beam on two women's shoulders, but only one woman in the village was tall enough to raise the beam to sufficient height on her shoulders. The other lifted it unsteadily over her head.

- Children were weighed with their clothes on. This is probably the only culturally acceptable and physiologically safe way to weigh children in this cold mountain climate. The supervisor explained that the clothes had been weighed in the past and that 500 gm were allowed for several layers of clothing and the swaddle wrapped around newborns, 200 gm for a few layers of clothing, and 50 gm for the shawl in which the children were carried. These estimates were subtracted from the child's weight before it was entered on the card.
- All children were weighed in the weighing pants except for a newborn who was suspended on the hook by her swaddling clothes.
- Detecto scales, made in the U.S., are used. The hand of this scale bounces wildly and the weight is very difficult to read. In some villages the hand fluctuates as much as 2 kg from month to month around the 10 kg mark. Staff observed that the scales could not be trusted around this weight. The evaluation team believes that accurate weighing would require scales that are not manufactured in the U.S.

The observed growth monitoring session confirmed these concerns that program managers are already addressing:

- It is extremely difficult for the promoters to read the weight from the scale and to subtract a variable number of grams before marking the card accurately.
- In field trials, American-made scales have not been able to compare with the British product for accuracy, reliability, ease of reading, and durability.
- The system of yarn colors for targeting at-risk children misses a number whose growth is faltering.

The CARE project manager has designed a study funded by PROCOSI, an umbrella organization of Bolivian PVOs, to analyze these growth monitoring problems more thoroughly

5.3.1.4 Iodine Deficiency Disease

Objective: 70 percent of target area population (42,000 people) should be using iodized salt or should have received iodine capsules or injections.

This objective was neither monitored in the information system nor systematically measured by the evaluation team survey. However, in observing the preparation of homemade ORS (*suero casero*), the survey noted that approximately a third of the mothers used iodized salt.

The project has participated in iodized oil injection and oral campaigns, and the information system reveals that 13 percent of the population received iodized oil, but it was not able to say what percentage received the oil by mouth and what percentage received it by injection.

The evaluation team did not investigate the comparative costs of iodized salt and noniodized salt sold in blocks. Supervisors in La Paz said iodized salt was much more expensive, and yet every household visited in the department of La Paz used iodized salt. The supervisor in Oruro said costs there were about equal.

5.3.1.5 Hygiene Education

Hygiene education focused on environmental sanitation: keeping the house clean, sweeping the floors, keeping the yard clean, and using the latrines. This education was well accepted and followed. Demand for latrines was almost universal, far exceeding previous experience in the Bolivian countryside.

In June 1989, a CARE survey revealed that there was no relationship between prevalence of diarrhea and maternal training in hygiene. The project manager distributed a memo to the departmental technical assistants asking them to emphasize handwashing with soap prior to preparing food, prior to eating, and after using the latrine.

During the evaluation, women were observed for hand washing prior to preparing ORS. Only four women used soap. They were also asked when it was important to wash their hands. Ten of the 50 mentioned all three times listed above. Many mentioned the importance of washing children's faces and hands in the morning. Least often mentioned was washing after using the latrine and most often mentioned was washing prior to preparing food. No home visited had hand washing facilities near the latrine, except for those with showers.

A number of mothers stated that it was important to wash their hands prior to breastfeeding but breastfed several times during the interview without doing so.

Only four mothers had a stored, clean, and covered supply of drinking water with which to mix the ORS. Many mothers, when asked to mix the ORS, expressed concern that they did not have boiled water. They were assured this was only a demonstration that did not require boiled water. These same mothers allowed their children to drink the sweet homemade ORS after it was mixed.

5.3.1.6 Latrine use

All latrines visited showed signs of being used. Most had been swept or washed and had a receptacle with paper. Communities which had been unable to get latrines expressed disappointment.

5.3.2 Sustainability

5.3.2.1 Immunizations

The excellent results achieved by CARE are the consequences of increasing not only the demand for immunizations but their availability. The policy of the Ministry of Health to vaccinate only three or four times a year reduces the opportunity for children under one year to receive vaccinations at an age when they are most vulnerable to infection. CARE has overcome this obstacle by encouraging the supervisors to pick up vaccines from the US whenever they are available and take them to the villages.

The promoters have not been taught how to vaccinate, although the Ministry of Health supports this level of training and has written an excellent manual for it with clear pictures accompanying the script. Its only flaw that it does not explain how to sterilize or dispose of syringes. Many promoters expressed a desire to learn how to vaccinate children.

But because they have not been trained to do this, the villages will be dependent solely upon the US to provide the logistics and personnel for vaccinations, and it is doubtful whether coverage will remain as high. The villages around Potosi visited by the evaluation team had been forced to rely on the US for vaccinations since August 1989, when a supervisor left and her duties were assumed by another supervisor whose expanded workload made the usual vaccination coverage impossible. No vaccinations had been administered in the six months prior to the evaluation, and the infants, the most vulnerable, were unprotected.

5.3.2.2 Oral Rehydration Therapy

The desirable practice of feeding and breastfeeding during diarrhea will probably continue unless there is a campaign to stop it. The sustainability of the use of ORS is harder to predict. It was disconcerting to discover that the mothers in two villages who insisted upon using pills instead of ORS had been persuaded to do so by the health professionals in the health centers. In a focus group interview of mothers in another village, all stated that they used ORS packets or a homemade ORS solution and continued feeding during diarrhea. However, when asked what else they needed to improve the health of their children, one woman said "medicines." When asked what she needed medicines for, she said "diarrhea." This suggested that mothers did not understand the use of ORS and that it is the best, not just the least expensive, treatment. The number of mothers who initially told the evaluators they used ORS and then later admitted they really used only traditional herbal tea (*mates*) also suggests that many mothers still believe in traditional treatments.

5.3.2.3 Growth Monitoring

Mothers regularly attended growth monitoring sessions in villages where they were required to attend in order to qualify for a water system. It is beyond the scope of this evaluation to predict how many would have come without this incentive.

5.3.2.4 Iodine Deficiency Disease

Mothers will probably continue to use iodized salt if they understand why it is necessary and if the cost is not too great.

5.3.2.5 Maternal Education in Hygiene

The project has done an excellent job in encouraging mothers to improve the hygiene in and around their homes and to wash their children's faces and hands each morning. The emphasis on hand washing to prevent diarrhea has only recently been stressed by the education program and has not been accompanied by assisting mothers to set up convenient hand washing areas to encourage this habit. For this reason, the habit is less likely to persist.

5.3.2.6 Latrine Use

Latrine use, particularly of flush latrines, will probably continue. People showed great pride in their latrines, especially the more deluxe models, but even the VIP latrines which were more than two years old had been freshly washed when the evaluation team arrived, and many people were replastering and refurbishing them.

5.3.2.7 Sustainability of Health Promoters

Although exact figures for the turnover of health promoters were not available, of the 400 promoters initially trained by the project (two for each of the 200 villages) approximately 60 percent had left. However, approximately 80 percent of those selected to fill the abandoned positions have remained. Project staff believed that the community had learned about the requirements for promoters and had faith that CARE would deliver on its promises; therefore more highly motivated promoters who understood what would be expected of them were chosen as replacements.

All the promoters interviewed felt that their training had been satisfactory, but all wanted more. Sustainability will surely rest on finding the means to continue this training.

5.3.2.8 Existence and Adequacy of Backup Systems for Health Care

The US is the most appropriate organization for the continued training and supervision of the promoters, but the lack of coordination with it in planning and design has been a concern of project staff. The start-up workshop for a new Dutch-funded water, sanitation, and health project recently held by CARE in Tarija made sure that the US was invited and participated in project design. Plans for phasing out the role of the supervisor and turning over supervisory and training responsibilities to US staff can be made for the new project. Whether or not the promoters trained by this program receive the kind of assistance they need will depend upon the informal arrangements they are able to make with local US staff in their areas. US limitations are likely to prove a handicap.

5.3.3 **Project Impact on Child Diarrheal Morbidity and on Child Mortality**

This program has had an indirect impact upon child morbidity and mortality. Studies have shown that an adequate supply of water for hand washing and food preparation can be as important in the prevention of diarrhea as a safe source of drinking water. Whether because of clean water or an abundant water supply, the incidence of diarrhea in the project communities was only 10-13 percent. Although this could not be compared directly with the

nationwide incidence of 29 percent, it did indicate decreased diarrheal morbidity. Since a child loses an average of 0.2 kg in each episode of diarrhea, this reduced morbidity would have a definite impact on malnutrition.

An immunization coverage of 85 percent produces herd immunity and effectively stops the transmission of immunopreventable diseases. Correct feeding, breastfeeding, and the use of ORT further reduce diarrheal mortality. It can be assumed that these interventions in the project were responsible for reducing morbidity and thus mortality as well. These indirect findings were corroborated by the statements of mothers and promoters that children kept better health since the program began. It was beyond the scope of this evaluation to quantify diarrheal-related mortality. Even if resources had been provided to the evaluators, there were no appropriate baseline data for a comparison. Responses to the question: "Have any children died in the past year of diarrhea?" which was used both for baseline data and in the midterm evaluation were vitiated by two factors: the definition of diarrhea in Aymara and Quechua was changed and clarified after the project began; and the term "past year" did not identify a specific period for illiterate mothers. They could have been recalling one year, two years, or a few months. It would have been more appropriate to have related the question to the period between the survey and a specific event, e.g., carnival.

5.4 Conclusions

The project has made great strides. In a short time, it found and trained dedicated promoters in 200 communities. Placing trained health professionals in the communities to train promoters on the job proved to be an extremely effective strategy. If the project did not meet all its objectives, this was probably because these were unrealistically high, the result of an ambitious program design. But its accomplishments were made in the most difficult way: by changing the behaviors and the expectations of parents in the matter of their children's health.

The following comparison with national rural averages shows the project has had a major impact:

<u>Intervention</u>	<u>Project Coverage</u> (percentage)	<u>National*</u> (percentage)
Immunization	90	27.8
ORT use	50	31.0
Growth monitoring	85	18.5

* (from DHS survey 1989)

Chapter 6

COMMUNITY PARTICIPATION

6.1 Design

The original design of this component envisioned community participation in organizing water committees, selecting water system operators and health promoters, organizing or strengthening mothers' clubs for child health promotion, providing labor for water system and latrine construction, and operating and maintaining the water systems. CARE supervisors and technical assistants were to help communities do all this.

The initial focus was on community participation as a means rather than as an end. Project priorities were principally on construction of water systems and child survival interventions and only incidentally on participation as a means to bring these about.

As the project developed, the need to improve the prospects for sustainability of project activities after CARE's intervention ended became evident. Consequently, during the third year of the project, a substantive design change placed more emphasis on developing effective community organization. A sustainability workshop (*taller de permanencia*) for senior staff was held in May 1988 to address the problem of the high dropout rate among community volunteers. Leaders' councils (*consejos de autoridades*) were organized to bring together the promoters and operators, the heads of the water committees and mothers' clubs, and other community leaders in support of project activities. This was the beginning of a shift in priorities to upgrade community organization which is now being implemented in CARE/Bolivia projects just getting underway.

Section 3.1.2.3 discussed a number of design issues that have had an impact on community participation in the project. Among these, the larger economic context and its effect on project viability and sustainability are really beyond the scope of this type of project to resolve. However, CARE is now incorporating into some new projects a component to help increase the income of the community and thus its ability to maintain its water system and other activities. This is a design change that should contribute to long-term sustainability. An alternative, less desirable, way to deal with such external factors as population decline and drought would be to select communities least likely to be affected by such problems. But this course would certainly contribute less to development.

Despite what the project has accomplished in community organization and participation, there are some design changes, highlighted in the following section, which would enhance the sustainability of future projects by devoting more attention to promoting effective community participation.

6.2 Implementation

6.2.1 Organization Types and Experience with Them

The project developed three types of community organizations which correspond to the three components and operate with community volunteers:

- Water committees, which work with water system operators
- Mothers' clubs, which work with health promoters
- Leaders' councils (*consejos de autoridades*), which bring community organizations together

The following subsections briefly review the implementation experience with these three types of organizations in the 20 communities visited.

6.2.1.1 Water Committees

Water committees were formed in all the communities, except in one which used an existing projects committee to oversee water system construction but which may create a new committee for operation and maintenance. Two of the communities had transformed their water committees into formal water cooperatives. A few had given responsibility for some aspects to other committees, e.g., by forming a separate administration committee to collect and manage tariffs.

These committees all appeared to be functioning reasonably well, and had been able to manage the construction and operation of their systems without many reported problems. However, some systems were still under construction and others had been so recently completed that it was difficult to tell whether the committees would be able to continue functioning well when external assistance ended. One community had reorganized its committee completely after discovering irregularities in accounting for tariff collection, but respondents said it was now working well.

Collaboration between the committees and the water system operators appeared smooth, and operators were generally reported to be performing well and were satisfied with their work, training, and supervision, as noted in Chapter 4. A number of communities provided monetary incentives for their operators, paid out of the tariffs collected. Several operators mentioned these as important benefits.

An important factor influencing the sustainability of the water committees and the water operators is that their work of ensuring the supply of water and the repair and maintenance of the systems makes their activity immediately evident to the community and keeps them accountable to it. Equally important is the high value the communities place on their water systems.

6.2.1.2 Mothers' Clubs

Mothers' clubs, as the principal venue for the activities of the community health promoters, are the primary organizational vehicles for the health component of the project. All but one of the communities visited had a mothers' club or center (in that community women and men met separately in general meetings on alternate weeks). Most of these clubs had been formed with the assistance of other NGOs; about a quarter had been organized by CARE. A few communities had two clubs or centers, one organized by CARE and another by another organization. One community said the women had organized their club on their own several years before the CARE project began. Almost all the communities had a meeting place for the mothers' club, adorned with health posters and charts. Most of the clubs met weekly for health education and growth monitoring activities, as well as for activities like needlework and cooking classes, and occasionally for fund-raising to improve club facilities.

The field visits raised several questions relating to the organization of mothers' clubs and the importance of participation in them.

- The most effective way of providing health education seemed to be through both mothers' clubs and general meetings attended by men and women. In those communities where only general meetings were used, few women attended and those that did not reported that their husbands shared no information with them. Conversely, in communities where health education was provided only through mothers' clubs, some husbands did not want their wives to attend, deeming it a waste of time or alleging that it kept them from performing their other duties. Presenting health information to men does not always preclude this problem, but it tends to increase their understanding and approval of health activities, provides reinforcement for women's involvement, and also involves men directly to some degree.
- Meeting times affect participation. In a community where health education was addressed only at general meetings, men determined the meeting time, which women found inconvenient and gave as the principal reason why they did not attend. In another community,

women also cited the meeting time as inconvenient, although they had originally agreed to it. Women seemed to prefer weekends or afternoons, which interfered less with their cooking, housekeeping, and animal-tending responsibilities. Several cited early weekday meetings as very inconvenient for these reasons.

- The format and style of presentation also influence participation. People said they liked visual presentations and demonstrations, and the opportunity to practice what they were learning. Several women mentioned how much they enjoyed practicing cooking new foods. But the use of such teaching methods was rare; most of the promoters relied mainly on talks (*charlas*). Limiting health education to talks sometimes contributed to loss of interest and poor attendance, as noted in Chapter 5, particularly when the women were treated in a condescending manner.
- The continued vitality of the mothers' clubs may also hinge on introducing additional activities of interest to the women. A number of women wanted classes in literacy, handicrafts, sewing (stressed as a way for them to save money by making their own clothes), cooking, and baking. Such income-saving activities could be supplemented by income-generating activities
- The gender of the promoter may also be a factor. In the communities visited there were an equal number of male and female promoters, but the turnover and the number of inactive or ineffective promoters appeared to be higher among the men. In communities where there were both male and female promoters, the female promoters were usually the ones who worked most closely and effectively with the women, though there were a few outstanding male promoters as well. While we are not prepared to say that all promoters should be women, a promoter's personal characteristics and way of dealing with women must be taken into account. In general, women tend to work better with women.
- The presence of more than one NGO in a community can influence participation and effectiveness. If activities are well coordinated, there is no problem. But if there are conflicts over turf among the mothers' clubs, for example, the community is split, making it impossible to reach a portion of it with health interventions.

6.2.1.3 Leaders' Councils

Leaders' councils (*consejos de autoridades*) were promoted after the 1988 sustainability workshop to integrate project activities within communities and develop a more effective support system for them. A little more than half the communities visited said they had organized a council, though this figure may be low because the question was not asked by all interviewers. About 65 percent of the communities in the project as a whole had councils.

These were uniformly described as useful in dealing with community issues. The communities in which things were working well seemed to be characterized by a close relationship among local authorities, the water committee, operators, and promoters, and a cooperative approach toward common objectives, which the council facilitated. Those with councils appeared better organized and with better prospects for sustainability. Only two communities with councils appeared to have poor prospects for sustainability, in both cases because of external factors—the loss of population due to economic conditions, and severe water problems.

The major issue with regard to councils is when they should be organized. In this project, they were not promoted until about a year ago, and in most instances even more recently. It was impossible to assess their longevity and continued effectiveness, since they had been given little time to develop as organizations before the end of external assistance.

A related issue concerns their role in water system construction. One CARE regional staff member felt that organizing councils prior to water system construction was not advisable because it led to interference in technical decisions. However, this argument would seem to contradict the project's interest in creating a sense of community ownership and responsibility for the water systems and other project activities. It ought to be possible to negotiate differences of opinion between technical personnel and the community without hindering the development of a strong community sense of ownership.

6.3 Achievements

6.3.1 Overall Participation and Sustainability

A major accomplishment of the project has been the creation or strengthening of community organizations by stressing the direct payoff from them (water systems, latrines, health education, etc.). As a result, respondents clearly recognized the value of organizing to meet needs, and one respondent said that was the only way his community would get any further help.

Most of the communities demonstrated a reasonably high degree of collaboration, as evidenced by attendance at meetings, participation in water system construction and maintenance, and payment of tariffs and other contributions. Most residents had become members of their water systems and had installed latrines where these were available. The reasons most often cited for not becoming members were access to another source or living too far for a feasible connection. In about a quarter of the communities, however, the residents had shown considerable initial reluctance to join because of doubts they would actually get water. People in one community said they had been given many promises, particularly from political parties, that had never been kept. When the CARE project began, there was a great deal of skepticism and even some outright hostility, which did not abate until materials had arrived and construction had started. At this stage, most people began to collaborate willingly.

Most of the communities clearly understood they owned and were responsible for their water systems, though there were a few people who thought the systems belonged to CARE or to the state. In most cases respondents credited their water committee and operators with doing a good job in operating and maintaining the system.

Sustainability was very hard to assess during our brief visits, so judgments made are highly tentative, based primarily on the degree of organization, participation, and satisfaction with project activities, both reported and observed. Nearly half the communities seemed capable of sustaining their activities and organizations after CARE intervention ends. In a couple of communities, either adverse economic circumstances or severe water problems made sustainability highly unlikely. In the rest, there simply wasn't enough information to make a judgment either way.

Although the likelihood of sustainability is stronger for water systems than for health activities because of greater community interest in and priority for water, a number of women ranked the health benefits of the project with water and a couple put health first. The fact that almost all the women felt their children were now healthier and attributed this to both the availability of water and health education is a major accomplishment that should contribute to the sustainability of health activities as well as the water systems.

6.3.2 Women's Participation and the Project's Impact on Women

Most of the women in the communities visited participated in the mothers' clubs and, to a lesser extent, in general community meetings. Those that did not belong to mothers' clubs tended to be older women who no longer felt that health education was relevant to them, or women who said they did not have the time to attend meetings.

The mothers' clubs have provided women with an opportunity for developing their leadership potential. An additional advantage of leaders' councils is that the president of the mothers' club is a member of the council and thus becomes an accepted part of community leadership.

There were only a few instances of women in other leadership roles, the most noteworthy being the woman treasurer of a water committee in Chalamarca, Tarija. There were also reports of several women on school committees (*juntas de auxilios escolares*) and a couple in agricultural organizations (*sindicatos agropecuarios*).

The large number of women on CARE's field staff, particularly among supervisors and technical assistants, as well as the large number of women health promoters, is important not only for the advancement of the women themselves, but for their role as models for increasing women's participation in such activities. CARE's field staff at the height of project activities (September-October 1988) was 40 percent female; the project manager at that time was also a woman. Among community health promoters, 60 percent were women. There were also 20 women among the 400 water system operators, though none in the communities visited.

In addition to gaining participation and leadership, women have benefitted from saving time and energy in hauling water several times a day, better health for themselves and their children as a result of clean water, better nutrition, and access to more sanitary latrines. On the average, women reported saving one to two hours a day formerly spent fetching water for household use, as well as time spent hauling their laundry to rivers or wells. All clearly appreciated the extra time they now had for other chores or for a little more leisure. Many commented that they were able to fix more and better meals for their families and keep their children and homes cleaner. Cleaner homes and healthier children were clearly a source of pride and enhanced their self-esteem. Nearly all commented that the piped water was not only much more convenient, but also much cleaner than the water they had formerly used, and they clearly recognized its health benefits.

An additional benefit many attributed both to having water and to health education was the vegetable gardens they had planted during the course of the project (see Chapter 7). Women with gardens reported that nutrition and health had improved for the whole family as more vegetables and foods they had not cooked before became part of the diet.

6.4 Conclusions

While a more participatory design would be desirable, the project has made substantial progress in promoting community organization and involvement. The water committees and leaders' councils are working well. The mothers' clubs could be strengthened by responding more closely to women's needs and preferences, particularly by introducing additional activities to keep them viable. The economic context has already exerted considerable

negative influence on sustainability and will continue to do so, indicating that an income-generating component would be useful to counteract depressed economic conditions and heavy emigration.

Chapter 7

FAMILY GARDENS, NUTRITION, AND MICRO-IRRIGATION

7.1 Design

This component of the project was partly designed, and partly just happened. The original project proposed that 13 percent of the families in the beneficiary communities should have family gardens. These gardens would be encouraged by promoters and advice would be given to the communities by agricultural experts. No mention was made of micro-irrigation.

This original design was both surprising and inadequate—surprising because it encompassed only 13 percent of the beneficiary population, inadequate because it did not include micro-irrigation, which is the key to determining where and what type of crops will be grown.

The project was later amended by agreement with AID, and the revised end-of-project objectives made no mention of family gardens. Nonetheless, they are discussed in this report because the evaluation team is convinced of their importance.

7.2 Implementation

Initially family gardens were encouraged, as planned, by promoters and agricultural experts. Because the evaluation team was not present during the early and middle periods of the project, it cannot state precisely what the results of this promotion and agricultural advice were. However, field staff from the project indicated that until the drinking water systems were completed, there was only a minimal increase in family gardens. They began to appear later in significant numbers, irrigated with water from the new systems.

Unfortunately, these systems were not designed to provide enough water for irrigation. A 15 square-meter garden requires an estimated 90 liters of water per day, or about 25 percent of the domestic water used by a family of five. A new system can easily supply this since it is generally designed to provide for a population increase of about 33 percent. Furthermore, sullage water (*aguas usadas*) can be used if the gardens are lower than the point of water use.

But it is completely out of the question for a drinking water system to supply water for large-scale irrigation. For instance, if every family were to water one hectare of land, this would require about 30,000 liters per family per day, or about 80 times what they required for domestic use.

7.3 Achievements

A small percentage of families in the project have developed gardens. The evaluation team did not gather data to determine this percentage, but estimated that it approached the 13 percent target of the original project proposal.

The key to promoting family gardens, and thus improved nutrition, is the availability of water for micro-irrigation. Interviews with community residents suggested that almost all families would have liked a supply of irrigation water. They would of course have preferred enough for large-scale irrigation, but would have been pleased to have at least enough for micro-irrigation.

7.4 Conclusions

- Family gardens probably should not have been eliminated as a project objective. (In any case, project field workers continued to promote them.)
- Increased water supply is the key to promotion of family gardens.
- Even if drinking water systems are not designed to provide enough water for family gardens, many families will nonetheless use them for this purpose.

Chapter 8

RECOMMENDATIONS

8.1 Overall Recommendations

The integration of water, sanitation, and health interventions in a single project has yielded synergistic results and lessons for future projects to build on. These lessons are outlined in the following recommendations.

8.1.1 Project Duration and Scheduling

Project duration and scheduling should be determined in collaboration with the funding agency, the executing agency, and counterpart institutions. If there is to be a follow-on project, USAID funding and implementation should begin without delay (by September 1990, if possible), so that CARE does not have to lay off experienced field staff who would be the best personnel to work on the new project.

When evaluating the appropriate duration and scheduling of a new project, the on-going nature of water, sanitation, and health needs should be taken into account. An abrupt start-up, relatively short duration, and abrupt termination should be avoided at all costs. The present project in effect had only a three-year duration because the first year essentially was lost. As a result, most water and sanitation systems were completed very close to the end, leaving no time for follow-up. This also impeded adequate development of community organizational capabilities.

For the reasons explained in Appendix F, it is strongly recommended that projects for water, sanitation, and health should have a duration of approximately seven years if at all possible.

8.1.2 Coordination and Communication

The following recommendations, based on the experience derived from the current project, are intended to improve similar future projects:

- Effective integration and coordination require that all counterpart institutions be treated as full and equal participants.
- This means that all counterparts should take part in project planning, particularly in the assignment of responsibilities to the various organizations in line with their actual capabilities, and be given a

greater role in selecting sites and specific interventions, coordinating construction and materials delivery schedules, determining information requirements and formats, and training community participants.

- Mechanisms for interinstitutional and intersectoral coordination and communication in each region should be devised, to provide for regular meetings at the operational and policy levels and for procedures to share written information and reports. Both CARE and counterpart staff should be encouraged to create and maintain formal and informal linkages among the participating institutions at all levels. Funds should be reserved for periodic workshops, including a start-up workshop for all participants.
- Counterpart contributions should be based on operating costs attributable to the project as well as on direct monetary contributions to ensure an equitable division.
- Regional institutions, with the collaboration of CARE, should devise a strategy for coordination with NGOs and other institutions to avoid turf conflicts and to maximize the impact of all development activities in the area. PROCOSI would be a suitable organization for this and should be used if possible. USAID could maximize the impact of the development projects it supports by requiring those operating in the same geographic area to coordinate their interventions to avoid duplication or gaps in coverage.

8.1.3 Geographic Coverage

The present project was undertaken in five departments of the country, which stretched the management and supervisory capabilities of the executing agency. The evaluation team would recommend that a future project distribute its work over fewer departments, but is not in a position to say what the optimal number should be.

8.1.4 Midterm and Final Evaluations

Realistic evaluation criteria should be agreed upon at the outset by all parties to the project, including the communities. These criteria should be used for an internal evaluation before any external evaluation team arrives. The external team should not have to undertake a full-scale evaluation, but from visits to a limited number of randomly selected project communities (perhaps five percent of the total) should be able to check on the accuracy of

the internal evaluation. The external team should also evaluate and supplement the results of the internal evaluation.

8.1.5 Financial Monitoring

- The Federal Reserve letter of credit (FRLC) balance should never be depended upon as an indicator of funds still available for expenditures.
- The original budget should always provide enough detail for project management to later determine whether expenditures are running as planned. (Such detail need not be included in the official line-item budget approved by USAID, but can appear as an annex to the proposal, with an indication of the basis for the line-item figures in the general budget.)
- Project management must always have a locally managed system for monitoring and controlling expenditures. Such a system should not only include disbursements of funds, but should also reflect funding commitments (such as orders that have been placed or for which bids have been solicited).
- The project management team must have access to timely and complete financial information summaries. This is the key factor for keeping a project on track financially.
- One way to ensure that project management and the USAID Mission have up-to-date financial information would be to have funds transferred directly from the Mission to the local CARE office, instead of from A.I.D./Washington to CARE/New York as at present.

8.2 Water and Sanitation Component

A moderate fixed subsidy of about \$35.00 per latrine (\$7.00 per capita), not including overhead factors, should be provided for the construction of each latrine, instead of the present subsidy of roughly two-thirds of the cost, no matter how expensive the latrines might be. Then the beneficiaries would select the type of latrine they are willing to pay for, and would meet the full cost above the \$35.00 subsidy. Under such a scheme, the dry open pit ventilated latrine (Type A latrine), which has been much less popular than the types with a water seal, would be eliminated except in locations where there is an acute water shortage.

8.2.1 Latrine Coverage

- A follow-on project with similar objectives should consider installing latrines in all communities which were not offered latrines because of budgetary or other constraints.
- A future project should aim for very high coverage because of the widespread popularity of the latrines among participating households which the present project demonstrated. The budget should be sufficient to provide latrines for 100 percent of the houses receiving yard (patio) taps, so that no participating households are left without latrines for lack of project funds. Nonetheless, the end-of-project status of such a future project should have an objective of less than 100 percent coverage to be realistic and to reflect the fact that experience in the promotion of latrines is still being gained.

8.2.2 Pumped Systems

Systems which require motorized pumping should be constructed only in exceptional circumstances, where there are clear indications that the community can afford to pay for operation and maintenance and has reasonable access to a town where a pump mechanic can be found.

Where motorized pumps are to be installed, consideration should be given to experimenting with solar pumping. Bolivia already has a number of solar pumping installations that have proved reliable, but there is still no experience with widespread use of this technology in rural villages of the country.

In locations where there is no alternative to pumping but a good quality aquifer lies at a depth of less than 12 meters, consideration should be given to the use of handpumps. Certain models can operate reasonably well at depths of as much as 45 meters, but there is only limited experience and no standardization of such deep-well handpumps in Bolivia. Fortunately, preliminary indications are that most of the rural population lives where the depth of the water table is less than 12 meters, and the country is beginning to gain experience with increasing numbers of shallow-well handpumps.

8.2.3 Monthly Water Fees

- A water system design should not be considered complete unless it includes an estimate of operation and maintenance costs, and the monthly fee that beneficiaries would have to pay to cover them. This is especially true for pumped systems.
- Where fees are expected to be relatively high, at least about 80 percent of the beneficiary households should be required to sign a commitment to pay them before construction begins.

8.2.4 Ensuring Good Quality Water

- If a water supply is found to be polluted, the first recourse should be to determine if the source of the pollution can be eliminated.
- If it cannot be eliminated, the second recourse should be to determine if a nonpolluted alternative source is available within a reasonable distance (see the following section for maximum distances to sources).
- If a water supply that has bacteriological pollution must be used, the first consideration for treatment should be a slow sand filter, which is a low-technology system. The International Reference Centre for Community Water Supply in The Hague and the Centro Panamericano de Ingenieria Sanitaria in Lima should be contacted for manuals in Spanish on the subject of slow sand filters for water purification in rural villages.
- Chlorination should *not* be considered a reliable long-term method of ensuring good quality water for small rural villages. This is because of the need for a constant supply of chemicals, and the fact that throughout the developing world most rural chlorination systems have eventually been abandoned.

8.2.5 Maximum Allowable Distance to Water Sources

- The project should not set a maximum distance, independent of population and cost, for which it will approve a water source.

- A more practical approach would be to set a limit related both to population (considering each household can reasonably be expected to dig only a limited number of pipe trenches) and to cost.
- The maximum distance related to population should be based on the experience of CARE and Bolivian institutions, but might be set at about 15 meters per person. Thus, a typical community of about 300 could consider a source up to about 4.5 kilometers away.
- A maximum per capita cost should be set for conduction piping (*tuberia de aduccion*) from the source to the community. But the application of such a limit could sometimes be complicated. The cost of pipe will vary according to material (galvanized steel costs about three times as much as PVC) and diameter. Therefore, even a rough estimate of the per capita cost requires some engineering analysis of the type of piping needed, the length, and the diameter (which is a function of both the volume of water to be supplied and the average slope of the terrain).

8.2.6 Water Distribution Based on Pressure Zones

In communities where a significant number of homes are on hillsides, the water distribution system should be designed with pressure zones. Optimally, each pressure zone should have its own storage tank and piping distribution network to avoid the frequently encountered situation where households at higher elevations are uncertain of reliable supplies.

The application of this recommendation will increase the cost of each water system, but will also increase the number of households that are reliably served. The cost increase might average about five percent. Whether it is justifiable will depend on the number of households that stand to benefit and on its effect on a particular system. Each case must be evaluated separately.

8.2.7 Timely Delivery of Construction Materials

The timely delivery of construction materials to each beneficiary village is important to avoid not only construction delays but also the frequent need to modify project designs.

8.2.8 Improvement of Existing Systems

- Future projects should provide for improving existing water supply and sanitation systems, especially those proving inadequate. Such inadequacies might relate to the quantity, quality, or convenience of a water supply, and to the objectionable odors, flies, or health hazards of sanitation facilities. Improvements should not be limited to communities where CARE has worked in the past.
- Wherever feasible, future projects should return to construct latrines in communities where CARE has worked in the present project but which still lack sanitation facilities (see Section 8.2.2).
- Future projects should, wherever possible, build on the achievements of present project communities and further contribute to their health education, community organization, and other activities.

8.2.9 Metering and Other Water Conservation Mechanisms

The cost of installing meters is probably not justified for typical domestic water systems where consumption is not excessive and the supply is adequate. Meters are worthwhile where the water source cannot provide what the standard design calls for and necessitates a mechanism for encouraging people to use no more water than they are allotted.

If a system is designed to supply domestic water and water for micro-irrigation, a mechanism is needed to control the diversion of excessive amounts to irrigation. This might be accomplished either by using meters or by limiting the area each family can irrigate.

8.2.10 Backup for Operations and Maintenance

Consideration should be given to developing an effective means for backstopping community maintenance of the water systems, including training replacement water system operators.

8.3 Health Component

8.3.1 Design

- Future project designs with the US, corporations, and communities should include a plan for phasing out the supervisor's role in the community and turning over supervision and ongoing training of the promoters to the US. The means to strengthen their capacity for this should be considered.
- Future projects should develop a plan for reaching all the children in a community. In some communities, children from families who were not part of the water system were excluded from the health program and are probably already at a disadvantage. An even greater effort may be necessary to assist them.

8.3.2 Immunizations

- The Ministry of Health manual on vaccinations should be used to train promoters to vaccinate, and training in the safe disposal or sterilization of syringes and needles should be added.
- Promoters should be taught to calculate how much vaccine they will need for their communities and how to request and transport vaccines in between immunization campaigns.

8.3.3 Diarrhea and Oral Rehydration Therapy

- ORT training should be reviewed jointly by the US and CARE staff. Use of antibiotics should be discouraged and the reasons why ORT is the safest and most efficacious treatment should be explained. Since at least one child at the regular mothers' club meeting will probably have diarrhea, treatment of this child should be used for demonstration purposes. ORS should be mixed and administered to the child for all mothers to observe.
- The recipe for homemade ORS should also be reviewed jointly by CARE and the US. A solution that is more culturally acceptable (based on herbal tea or rice water, for example) and requires measuring instruments found in most homes could be developed.

This is not a recommendation for CARE to develop its own new recipe. A recipe different from that of the Ministry of Health only confuses mothers and health workers and risks dangerous treatment.

- Community monitoring of diarrhea and the use of ORT should be by survey rather than passive reporting, and should include a demonstration of the preparation of homemade ORS with ingredients and utensils in the home. Clinic-level reporting, of course, will need to adhere to the morbidity reporting of the Ministry of Health and can be compared with the community surveys.
- A diarrheal prevalence survey of communities with and without water would be useful for future USAID funding decisions. USAID may wish to commission a group of PVOs to work with CARE to do this.

8.3.4 Growth Monitoring and Nutrition

- Mothers should be taught that the "road to health" cards are useful not only for them but for health providers who need a thorough history when their children are sick. They should learn the importance of keeping the cards up to date and of taking the cards with them if the family moves or migrates.
- Infants should be suspended from their mothers' carrying shawls rather than in the weighing pants.
- Scales should be securely suspended during all growth monitoring sessions.
- A mechanism for accurately weighing children with their clothing should be developed.
- USAID should obtain a waiver of the requirement for U.S. procurement so that more reliable scales can be purchased elsewhere by future projects. (The best scales are British-made and may have to be imported.)

8.3.5 Iodine Deficiency Disease Prevention

- The difference in the price of iodized and noniodized salt and the local availability of both should be checked, and communities or distributors should be encouraged to develop a system for supplying iodized salt cheaply.
- Project effectiveness in promoting iodized salt should be monitored during the ORT surveys.

8.3.6 Maternal Education

- The emphasis on home and environmental sanitation should continue, and training programs should be rewritten to explain why handwashing is so important. Messages such as "wash hands prior to breast feeding" should be dropped as they are impractical and have not proved necessary.
- Families should be assisted in setting up handwashing areas near the latrines. There are inexpensive plastic jugs fixed to dispense small amounts of water at a time that could be included in the equipment families receive when they build their latrines.
- Water tap equipment should include pots with tops for storing drinking water. Women can be taught to boil water after cooking, or to sterilize the water in the sun in plastic jugs. Recommendations for daily washing of these water storage pots should also be included in the hygiene education for the mothers.

8.3.7 Information System

- The program should build on the successes it has had with its information system, redefine the information needs at each level of the health system, and streamline the data reporting to meet these needs. This will have to be done with the US so that the system meets their needs as well. Computer graphics should be added to the reporting system.
- Vital statistics reporting should either be discontinued or, preferably, improved, using some of the suggestions in Section 3.2.7 and enlisting community support for enhancing its value.

8.4 Community Participation Component

- The project design should leave room for community participation in project interventions—determining priorities, making decisions on water sources, latrines, and the best types of community organizations—so as to build a sense of community ownership of the project and thereby ensure its sustainability by developing greater planning and organizational capabilities.
- More and earlier attention should be given to strengthening community organization and capacity for sustaining project activities over the longer term. Leaders' councils should be promoted earlier in the project. This will require more person/hours of work by both technical assistants and supervisors.
- Project activities and components should be phased in carefully to provide tangible benefits early in the project and avoid undue delays, so that community motivation is not allowed to flag.
- Health education should be directed both to mothers' clubs and to general community meetings, to reach men as well as women, and thus promote understanding and participation of all community members in health activities
- Focus groups or other inquiries should be used to identify the most suitable times, format, and style of health education meetings. Greater efforts should be made to employ participatory techniques rather than just lectures.
- In consultation with the communities, selection criteria for promoters should be modified to include personal characteristics and a style conducive to effective communication with women.
- Future projects should consider adding a component to increase community income and thereby the chances for long-term sustainability. Also to be considered should be income-saving activities for women, such as home sewing or buying cooperatives for basic purchases, and income-generating activities, such as handicrafts or growing vegetables for sale. Such activities should be organized through the mothers' clubs, because they would not only add to income but also strengthen the viability of the clubs and hence the sustainability of their health activities. Literacy training could be

added, using the "road to health" cards and health posters as training tools.

- New projects should be located in the geographic areas of current project communities, to the degree feasible, to provide some follow-up to these communities. Since this could conflict with the desire to lower costs by concentrating future projects geographically, it could be restricted to communities most in need of further assistance.

8.5 Micro-irrigation and Family Gardens

Consideration should be given to adding a micro-irrigation component to integrated water, sanitation, and health projects as a means to improve nutrition and health. Such a component might be designed around a fixed per capita subsidy (for example, about \$25.00). It would be the responsibility of a project engineer to determine whether a community was so situated that a subsidy would assist with the construction of an irrigation system. The engineer would also have to determine whether providing a supply independent of the domestic water supply or increasing the volume of the domestic water system would be better.

ANNEX A
SCOPE OF WORK
FOR THE FINAL EVALUATION

I. PROJECT TO BE EVALUATED

Project Title: The CARE Child Survival and Rural Sanitation Project.

Project Number: 511-0599

Authorization Date: 08/21/86

Obligation Date: 08/21/86

Authorized Amount: \$5,000,000 (Grant)

PACD: 08/20/90

II. PURPOSE OF THE EVALUATION

The purpose of the evaluation is to assist the Mission to assess the strengths and weaknesses, accomplishments and failures of the existing CARE Child Survival and Rural Sanitation Project and to make recommendations for a follow-on project beginning in FY91.

III. BACKGROUND

The purpose of this Project is to address the principal causes of illness and death in Bolivia's rural child population (0-4 years). Its specific target is the reduction by 25% of pre-project infant/child mortality in each participating community. The Project has three integrated components: 1. Provision of Health Services, including Health Education; 2. Provision of potable water and sanitation facilities, including instruction in the use and maintenance of water systems, and; 3. Community development and institution building.

The project has been carried out by CARE/Bolivia, five Development Corporations and Health Units and 200 communities in the Departments of Tarija, Potosi, Oruro, Chuquisaca, and La Paz.

IV. STATEMENT OF WORK

A. Requirement:

1. The Contractor will conduct a final evaluation of the Care Child Survival and Rural Sanitation OPG including developing, measuring and interpreting evaluation indicators in coordination with all major project donors and participants. The participants include five Development Corporations and Health Units, and 200 communities in the Departments of Tarija, Potosi, Oruro, Chuquisaca, and La Paz, USAID/Bolivia and CARE.

2. Assess reasons for a cost overrun in the project in 1988 and 1989 and how it can be avoided in the future.

3. The Contactor will also recommend improvements in design and operations for a possible follow-on project.

II. Expected Outputs

A. Questions to be addressed:

Operational definition:

1. Project Design and Start-up:

a. Was the Project design of integrated health, water and sanitation activities adequate to compensate for its complexity?

Analyze difficulties and benefits caused by the project design. Make recommendations for future projects.

b. Was the project design significantly altered by CARE?

Compare original design with actual project.

c. Should any component be deleted or others added?

Analyze which components caused undue complications without compensatory benefits and recommend additional components to fill any project gaps.

2. Process:

Were the following project areas feasible and realistic and to what extent was CARE able to implement activities in these areas?

a. Water system construction

Analysis to include the following areas:

1. Community selection
2. Water site selection
3. Water quality
4. System designs
5. Construction
6. Community acceptance
7. National administration
8. Local administration
9. Construction/connection fees
10. Completion progress.

b. Latrine construction

Analysis to include the following areas:

1. Latrine designs
2. Construction
3. Fees
4. Community acceptance

- c. Water system maintenance
- Analysis to include the following areas:
1. Community organization
 2. Fees and collection system
 3. Maintenance training and supervision
 4. Maintenance equipment and materials
 5. Water treatment
- d. Community satisfaction
- Analyze user participation in the project. Are users satisfied with construction and quality of water system and latrines? Do they understand and will they continue to pay user fees for maintenance?
- e. Sustainability of water system and health services
- Analyze adequacy of training, continuity and performance of a) water system operators, b) health promoters, and c) water committees. Analyze existence of back-up systems for maintenance and health care.
- f. Water tariffs and installation costs
- What percentage of the population do not pay the tariffs and installation fees? How does this affect the project's goals?
- g. Service costs
- How can the overall costs of the project be reduced?
- h. Institution strengthening methods
- How can other institutions be better brought into the project and be improved?
- i. Project coordination and communications
- Analyze perceived and real barriers to project communications and coordination and recommend improvements.
- j. Health promoters
- Analyze selection, training, supervision, incentives, community acceptance and accomplishments of health promoters.

k. Mass communications

Analyze appropriateness and impact of health, water and sanitation messages and media and recommend improvements.

4. Project Accomplishments - How acceptable are the following:

a. The quality and sustainability of water systems and latrines

Analyze from a civil engineering viewpoint.

b. Immunization and ORT coverage, hygiene, latrine use, nutrition and maternal education

Compare with baseline, control communities and national survey data.

c. Project impact on child diarrheal morbidity

Compare with baseline, control communities and national survey data.

d. Probable impact on child mortality

From the previous two analyses, deduct probable impact on child mortality (not an epidemiological study).

e. Project impact on women

How does the availability of water affect women's time for health and or production activities? Document women's participation in project.

5. Benefit analysis:

a. What were other perceived project benefits?

Report benefits perceived by project participants.

B. Conduct De-Briefing Workshop in Spanish by March 30, 1990.

C. Present written final report in English and Spanish by April 15, 1990.

III. Methodology

The Contractor will assemble a team of expatriate and national experts having the skills listed in section IV. D. A team planning meeting will be held to establish objectives, methodologies and to unify the team. Documentation from USAID/Bolivia, CARE/Bolivia and selected CARE Departmental offices will be analyzed. A sample of CARE project communities will be visited and data collected to compare with data from a sample of equivalent communities without the CARE interventions. The data will be analyzed and results presented in a de-briefing workshop to be conducted by the contractor in Spanish. A final written report will be provided to USAID in English and Spanish.

IV. Background Information

A. Project location:

200 communities in the departments of Tarija, Potosi, Oruro, Chuquisaca Bolivia.

B. Evaluation Timeframe:

Four weeks March - April, 1990.

C. Reference Materials:

Grant Letter and Amendments
Mid-term Evaluation
Quarterly Reports
Diarrhea study
DHS Report
John Snow Report
CONALPO Report
Ministry of Health Reports

E. Contacts:

CARE/Bolivia Tel: 78-6341, 78-3534:
Frank Sullivan, Director
Chris Roesel, Project Manager

USAID/Bolivia Tel: 32-0824
Paul H. Hartenberger, Chief, HHR
Charles Llewellyn, Project Manager

V. COMPOSITION OF EVALUATION TEAM AND TERMS OF PERFORMANCE

The contractor will provide an experienced team leader/engineer and a community participation specialist. CARE will provide a health education specialist and the TPM facilitator and USAID will provide an epidemiologist.

The working days breakdown for each team member would be as follows:

Travel:	4 working days
Team planning:	2 working days
In-country work:	24 working days
Debriefing:	1 working day
Finishing report:	<u>2</u> working days
	33 working days

A six-day week is envisioned for the field work. The required services should start o/a March 5, 1990.

The work order will be valid for four months from the date of signature.

VI. RELATIONSHIP AND RESPONSIBILITIES

The contractor will work under the direct supervision of USAID/Bolivia office of Health and Human Resources.

VII. REPORTS

Before departing the field, the contractor will prepare a draft report in English, of approximately 30 pages (excluding annexes) with an Executive Summary of 3-4 pages. The contractor shall make a presentation of the findings of the evaluation to the Mission before departing from Bolivia. The final report shall include a completed A.I.D. Evaluation Summary Form (see Attachment C), and will be forwarded within two weeks of departure. The contractor will send ten copies of the final report to the Mission. CARE/Bolivia will be responsible for translating the final report to Spanish.

The Contractor will also prepare a draft A.I.D. Evaluation Summary report using the standard A.I.D. format (Attachment C).

VIII.

SPECIAL REQUIREMENTS

For short-term technical assistance, the following applies:

The altitude of La Paz (13,400 feet above sea level) can have a deleterious effect on the health of persons with pre-existing medical problems and/or respiratory infections. Individuals with hypertension, diabetes, angina pectoris, coronary heart disease, asthma, emphysema, chronic bronchitis, or any history of heart attack, heart disease, or lung disease, should have a thorough evaluation by their physician prior to traveling to La Paz. Persons with any respiratory infection, such as cold, bronchitis, or pneumonia should delay travel to La Paz until they have fully recovered.

USAID/Bolivia requires a doctor's statement declaring that incoming short-term personnel are not afflicted by any of the above pre-existing medical problems. If such problems exist, a full physical exam is required prior to departure for Bolivia.

Adjustment to the altitude usually requires only a few days. Personnel should, if at all possible, limit their physical activity for the first 36-48 hours after arrival in La Paz.

Infectious hepatitis, amoebic dysentery, bacillary dysentery, giardiasis, rabies and typhoid are endemic in Bolivia. Yellow fever and malaria are present in tropical areas of Bolivia. The usual sanitary precautions concerning food and water should be observed and all immunizations should be up to date prior to arrival in country. Yellow fever vaccine is recommended for all personnel traveling to tropical areas. Rabies pre-exposure prophylaxis (not the low-dose intradermal injections) is recommended for all personnel who plan to spend considerable time outdoors on foot. The Embassy Health Unit can advise personnel traveling to tropical areas concerning malaria prophylaxis on a case by case basis. The precautions and need for medications are determined by the duration of travel, the extent of exposure, and drug allergy history.

W2659H/2616H

ANNEX B

INTERVIEW FORMS

CUESTIONARIO PARA PERSONAL REGIONAL DE CARE -
DESARROLLO INSTITUCIONAL/INTEGRACION

Fecha _____
Entrevistador _____
Depto. _____
Cargo del Informante _____

1. Cuál es la función de las instituciones contrapartes (Corporación de Desarrollo y Unidad Sanitaria) en el proyecto?

2. Cree que están cumpliendo bien sus funciones? (explique)

(si no ha salido claro antes, pregunte:) Cuáles han sido los logros más importantes en cuanto a la participación de las instituciones contrapartes?

Cuáles han sido los problemas más graves en cuanto a su participación?

3. Cómo calificaría Ud. el funcionamiento e impacto del proyecto en esta región? (explique)

Hay obstáculos que impiden su funcionamiento o disminuyen su impacto? (explique)

Han habido cambios que han mejorado la marcha del proyecto? (explique)

4. Cómo calificaría la comunicación entre las varias instituciones involucradas en el proyecto? (explique)

Si hay problemas de comunicación, a que se deben?

Cuáles serían las soluciones a estos problemas?

Quien tendría la responsabilidad de buscar e implementar soluciones?

5. Cree que se ha logrado la integración tanto de los componentes del proyecto (agua, salud, participación) como de las instituciones involucradas? (explique)

Si falta, que se podría hacer para mejorar la integración del proyecto?

6. Hay instituciones que deben participar que no lo han hecho? (explique)

Que se podría hacer para conseguir su participación?

7. (si no se contesta arriba) Hay un Comité Regional de las instituciones participantes? Si hay, quienes participan? (instituciones y cargos de sus representantes)

Con qué frecuencia se reúne?

Cuál es su propósito o su función?

Le parece útil? (explique)

8. Como ve las perspectivas de permanencia del esfuerzo hecho a través de este proyecto una vez que terminara el apoyo de CARE? (explique)

Que se podría hacer para asegurar la permanencia?

Quienes serían los responsables?

CUESTIONARIO PARA CONTRAPARTES
(UNIDADES SANITARIAS Y CORPORACIONES DE
DESARROLLO) - DESARROLLO INSTITUCIONAL/INTEGRACION

Fecha_____

Entrevistador_____

Depto._____

Tipo (CDD o US)_____

Cargo del Informante_____

1. Cuáles ~~son~~ ^{son} las funciones de la (CDD o US) en el proyecto CARE?

Desde cuándo está desempeñando estas funciones la institución?
Ha cambiado durante el transcurso del proyecto? (explique)

2. Cree que está cumpliendo bien esta función? (explique)

(si no ha salido claro antes, pregunta:) Cuáles han sido los logros más importantes en lo referente a la participación de su institución?

Cuáles han sido los problemas más graves en cuanto a su participación?

3. Hablando ahora del proyecto en general, como calificaría su funcionamiento e impacto en esta región? (explique)

Hay obstáculos que impiden su funcionamiento o disminuyen su impacto? (explique)

Han habido cambios que han mejorado la marcha del proyecto?
(explique)

4. Cómo calificaría la comunicación entre las varias instituciones involucradas en el proyecto? (explique)

Si hay problemas de comunicación, a que se deben?

Cuál serían las soluciones a estos problemas?

Quien tendría la responsabilidad de buscar e implementar soluciones?

5. Cree que se ha logrado la integración tanto de los componentes del proyecto (agua, salud, participación) como de las instituciones involucradas? (explique)

Si falta, que se podría hacer para mejorar la integración del proyecto?

6. Hay instituciones que deben participar que no lo han hecho? (explique)

Qué se podría hacer para conseguir su participación?

7. (si no se contesta arriba) Hay un Comité Regional de las instituciones participantes? Si hay, quienes participan? (instituciones y cargos de sus representantes)

Con qué frecuencia se reúne?

Cual es su propósito o su función?

Le parece útil? (explique)

8. Cómo ve las perspectivas de permanencia del esfuerzo hecho a través de este proyecto una vez que terminara el apoyo de CARE? (explique)

Qué se podría hacer para asegurar la permanencia?

Quien sería responsable?

9. Cree que su institución estaría dispuesta a seguir prestando apoyo a las comunidades si CARE cierra su participación?

HAY OTRA INSTITUCIÓN QUE ESTARÍA DISPUESTA Y CAPAZ DE PRESTAR APOYO? CUÁL?

AGUA POTABLE, LETRINAS, HUERTOS FAMILIARES, Y MICRO-RIEGO
CUESTIONARIO PARA COMITES DE AGUA POTABLE (PRESIDENTE O MIEMBROS)

Fecha_____.
Entrevistador_____.
Comunidad_____.
Depto._____.
Presidente o miembro: Pres. Miem.
Sexo del Informante: M F

AGUA POTABLE:

1. Cuando se terminaron la construccion del sistema de agua potable?
2. Cuantos socios (familias) participan en el proyecto?
3. Cuantos familias no son socios (no participan)?
Porque no participan estos familias?
4. La toma de agua da suficiente agua durante todo el ano?
Si no da todo el ano, entonces durante cuantos meses no hay suficiente agua?
5. Con que frecuencia hay fallas?
Que tipo de fallas han tenido?
6. El agua llega, durante todo el dia, a las casas de todos los socios?
Si no llega a todos los socios, entonces cuantos socios no reciben agua durante todo el dia?
Por promedio, durante cuantos horas por dia llega el agua a las casas de estos socios?
7. La comunidad esta contenta con el sistema de agua potable?
Porque?
8. Donde fueron la gente para conseguir agua antes de la construccion del sistema de agua potable?
Cuanto tiempo tardio ir (ida y vuelta) para llegar a la fuente anterior?
9. Cuanto es la tarifa mensual para agua potable? _____ Bolivianos
10. Todos los socios pagan sus tarifas?
Si algunos no pagan, cuantos familias no pagan?
Por que no pagan ellos?
11. Cuantos jornales de trabajo hizo cada familia para construir el sistema de agua potable?

LETRINAS:

12. Cuantos socios (familias) han construido letrinas?

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

14. La gente son contentos con sus letrinas?

Todo el mundo usan las letrinas?

15. Han tenido problemas con las letrinas?

Cuales fueron los problemas?

HUERTOS FAMILIARES:

16. Antes del proyecto, cuantas familias (mas o menos) tienen huertos familiares con legumbres para consumo familiar?

17. Ahora, cuantos familias (mas o menos) tienen huertos familiares con legumbres para consumo familiar?

18. Que factor (cual cosa) fue el mas importante para promover la siembra de huertos familiares?

MICRO-RIEGO:

19. Hay sistemas de riego en la comunidad?

Si hay sistemas de riego, desde cuando han tenido estos sistemas?

Son muchos estos sistemas?___ Cuantos familias los tienen?___.

Estos sistemas (por lo general) riegan solamente pedazos pequenos de terreno, o terrenos grandes?

Cual es el fuente de agua para estos sistemas?

20. Se permite el uso del sistema de agua potable para regar huertos familiares o terrenos?

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

21. Les parece muy importante construir sistemas de riego?

Por que?

CUESTIONARIO PARA LIDERES COMUNITARIOS
Y DE CLUBES DE MADRES - PARTICIPACION COMUNITARIA

Fecha_____

Entrevistador_____

Comunidad_____

Depto._____

Sexo del Informante: M F

1. Desde cuándo entró el proyecto de CARE en la comunidad?
2. Como fué el proceso de consulta con la comunidad sobre lo que se proponía hacer? (explique, p.ej. reunión comunitaria, encuesta sobre necesidades, etc.)
3. Cómo se decidió sobre las actividades específicas que se llevarían a cabo con la ayuda de CARE? (p.ej. las de salud y agua)
4. Las actividades se han desarrollado según sus expectativas? (explique)

QUE SUGERIRÍA PARA MEJORAR LA MARCHA DEL PROYECTO?

5. Quienes son los responsables de la buena marcha del proyecto?
6. La comunidad en general ha mostrado interés y colaboración con las actividades del proyecto? Hay variaciones de interés o colaboración entre las diferentes actividades (p.ej. salud o agua)?

Si no hay mucha colaboración, a que se debe?

Que se podría hacer para que colabore más la comunidad?

7. Como calificarían la colaboración y el desempeño de los promotores? (explique)

De los operadores del sistema de agua? (explique)

De los supervisores de CARE?

DE LOS INGENIEROS Y MEDICOS DE CARE?

De la Unidad Sanitaria?

De la Corporación de Desarrollo?

8. Hay algo que se debe hacer para que estos esfuerzos funcionen mejor? (explique)

Quiénes serían responsables de ver que esto se hace?

9. Cree que seguirían funcionando las actividades de salud y agua si el personal de CARE no estuviera? (explique)

10. Ha asistido a alguna reunión conjunta entre los promotores, operadores del sistema de agua y autoridades locales?

(si lo ha hecho)

Cuántas veces?

Cuándo?

Dónde?

Lo encontró útil?

Porqué?

11. Cómo es el gobierno (cuáles son las autoridades) de la comunidad? (forma de organización y grado de autonomía local)

Cuántas personas?

Hay mujeres entre las autoridades o en otros cargos de responsabilidad? (explique)

12. Las autoridades locales tienen algún rol en supervisar el manejo o la contabilidad de las ~~cuotas~~ ^{TARIFAS} pagadas por el sistema de agua? (explique)

CUESTIONARIO PARA COMITES DE AGUA -
PARTICIPACION COMUNITARIA

Fecha _____
Entrevistador _____
Comunidad _____
Depto. _____
Sexo del Informante: M F

1. Cuando comenzaron los preparativos para la construcción del sistema de agua?

2. Cuando se formó el Comité de Agua?
Es ésta la mejor organización para encargarse del agua o debería encargarse otra? (explique)

3. Ud. ha integrado el Comité desde su comienzo? Si no, desde cuando?

4. Cuántas personas hay en el Comité?

Hay mujeres en el Comité? Cuántas?
Participan igual que los hombres?

5. Como fueron seleccionados los miembros del Comité?

Que calificaciones se buscaban para ser miembro del Comité?

6. Que responsabilidades tiene el Comité?

Las desempeña bien o han habido problemas? (explique)

7. Con qué frecuencia se reúne el Comité?

8. Cuántos de los integrantes asisten normalmente a las reuniones?

(Pregunte lo siguiente solamente si no se ha explicado bajo el No. 6 arriba)

9. Que papel juega el Comité en el mantenimiento del sistema? Todo marcha bien? (explique)

10. Que papel juega el Comité en cobrar las ^{TARIFAS Y APORTES} ~~tasas~~ y llevar o supervisar la contabilidad y el uso del dinero recolectado? Todo marcha bien? (explique)

QUIEN ES EL RESPONSABLE DE LLEVAR LA CONTABILIDAD?

CÓMO SE LLEVA? (PIDE QUE LE MUESTRE) LOS LIBROS DE CONTABILIDAD?

CÓMO SE CIAMA EL DIVIPEO? 105

CUESTIONARIO PARA PROMOTORES DE SALUD
Y OPERADORES DE SISTEMAS DE AGUA - PARTICIPACION COMUNITARIA

Fecha _____
Entrevistador _____
Comunidad _____
Depto. _____
Promotor _____ Operador _____
Sexo del Informante: M F

1. Cuánto tiempo ha trabajado Ud. como (promotor de salud/operador del sistema de agua)?

(si no es el original) Porqué dejó el cargo el anterior promotor o operador?

2. Está satisfecho con su trabajo?
Piensa seguir como (promotor/operador)? Porqué?

(si no explica antes) Cuáles son sus logros más importantes?

Cuáles son los problemas más graves que enfrenta?

Ud. los ha podido solucionar? Si no, que solución ve para estos problemas?

3. Quien tiene la responsabilidad mayor para (la salud/el agua) en esta comunidad?

(si es el promotor/operador)

Desde cuándo?

Cuales son sus responsabilidades principales ahora? Han aumentado?

Se siente cómodo con estas responsabilidades? Porque?

Cree que la capacitación que ha recibido es adecuada?

Si no, que más cree que necesite?

Recibe apoyo y supervisión adecuada? De quién?

(si es de personal de CARE) Cree que podría seguir bien sin ese apoyo?

Hay otra fuente de apoyo o supervisión? Cuál?

Le parece adecuado a sus necesidades?

4. Como calificaría Ud. el interés y la colaboración hasta la fecha de la comunidad?

(para promotores) Cómo calificaría la colaboración de la Unidad Sanitaria?

(para operadores) Cómo calificaría la colaboración de la Corporación de Desarrollo?

Y la colaboración del personal de CARE?

5. Ha asistido a alguna reunión ^{DE COMUNIDAD O ZONA} conjunta entre los promotores, operadores del sistema de agua y autoridades locales?
(si lo ha hecho)

Cuántas veces? Cuándo? Dónde?

La encontró útil? Porque?

6. (para operadores de agua solamente) Cuántas personas integran el comité de agua? Cuántas mujeres hay en el comité?
Hay mujeres en cargos de responsabilidad? Cuáles cargos?

Cuales son las responsabilidades del comité?

Se desempeñan bien?

Con que frecuencia se reúnen?

Asisten todos o solo una parte de los integrantes?
Cuántos asisten normalmente?

7. (para operadores) Quién cobra las ^{TARIFAS} ~~tarifas~~ de agua?

Quien es el responsable de llevar la contabilidad?

~~Como se lleva la contabilidad? (pide que le muestren los libros de contabilidad)~~

~~Como/donde se guarda el dinero?~~

Funciona bien ese sistema? Ha habido algun problema?
(explique)

CUESTIONARIO PARA FAMILIAS - PARTICIPACION COMUNITARIA

Fecha_____

Entrevistador_____

Comunidad_____

Depto._____

Sexo del Informante: M F

1. Conoce Ud. un proyecto de CARE en esta comunidad?

Cuando comenzó?

2. Que hace el proyecto de CARE?

3. Ha recibido Ud. o su familia algun beneficio de este proyecto?

Cual(es)?

4. Cual es el beneficio más importante para Ud.? Porqué?

5. Alguien le ha enseñado algo sobre la salud?

Quien?

ALGUIEN MÁS?

Como se le enseñó? (p.ej. por charla, demostración, visita a casa)

Le parece una buena manera de enseñar? Porqué?

6. Que aprendió Ud. sobre la salud?

Le parece útil lo que aprendió? Que ha sido lo más útil para Ud.?

Lo ha utilizado alguna vez? Cuantas veces? Para qué?

Si no lo ha usado, porqué?

7. Ud. y su familia hacen algo diferente ahora que antes para proteger su salud? Qué?

Porqué?

8. Ha notado algun cambio en la salud de su familia desde entonces?

Cuál(es) y en quienes?

9. Tiene letrina? (si hay) La consiguió por medio del proyecto CARE o por otro medio (cuál)?

(si por CARE) Uds. aportaron dinero, materiales y/o mano de obra?
Cuanto?

10. Valió la pena este esfuerzo? Porque?
Todos en la familia usan la letrina?

11. De donde saca su agua? (aclarar si el sistema de agua CARE ya
funciona y si tiene acceso a él)

12. Ud. o alguien de su familia fue consultado sobre la decisión
de instalar este sistema de agua? Cómo?

Le han preguntado sobre sus necesidades? Las han tomado en
cuenta?

13. A quien pertenece este sistema?
Quien es responsable por él? Quienes lo mantienen?

Quienes pagan por su instalación?

(sigue si hay sistema CARE funcionando)

14. Uds. pagan sus ~~costos~~ ^{TARIFAS} Cuánto al mes?
A quien?

Como les parece la ~~costo~~ ^{TARIFA}: alta, regular, baja?
Si no paga, porque?

15. Hay suficiente cantidad de agua?
Todo el día? (cuándo no)
Todo el año? (cuándo no)
Sale limpia o sucia?
Está satisfecho con la calidad del agua?

Ha habido algun problema con el suministro de agua debido a
problemas de mantenimiento? ^(U OTRA RAZON) (explique)

Si hay problemas, a quien se quejan?
Responden?

16. Ahora usa más agua que antes del sistema? Para qué la usa?

^{NOTADO}
~~HA HABIDO~~ ALGUN CAMBIO DESDE QUE TIENE ESTA AGUA? (BUSCA EFECTOS EN SALUD)

17. (para mujeres) Le ha aliviado el trabajo tener acceso al
sistema de agua?
Cómo?

Cuánto tiempo se ahorra por día?

Para qué se usa este tiempo que ha ganado?

18. Hay grupos organizados en la comunidad (p.ej. comités, clubes

de madres) que se preocupan de la salud y el bienestar? Cuáles?

Existían antes del Proyecto CARE?

Son efectivos? Qué hacen?

Las mujeres participan? Ud. (o su esposa, si el informante es hombre) participa? Cómo?

Hay mujeres entre los líderes de la comunidad y/o en los comités de agua?

Tienen cargos de responsabilidad? Cuáles?

GUIA INSTRUCTIVA

PARA EL LLENADO DEL FORMULARIO PARA MADRES

1. Asignar un número, en forma correlativa, para cada madre.
2. Anotar el nombre de la mujer.
- 3a Anotar si existe conexión de agua y que funcione en la casa; si o no.
- 3b Anotar si la familia utiliza el agua en forma correcta; observar si guarde el agua en tanques o recipientes con buenas tapas; si o no.
- 4a Anotar si la familia tiene una letrina que sea de la casa; si o no.
- 4b Anotar si la familia usa la letrina, y si ésta se encuentra limpia.
5. Pedir a la madre que muestre cómo prepara ella el SRD. "Puedes mostrarme cómo preparas SRD", (utiliza las palabras más conocidas?); si o no.

De no ser así, anotar y seguir con la siguiente pregunta; después de conocer porqué no, averiguar:

"Qué necesitas para preparar?". Si indica que el paquete, se le debe entregar uno.

"Por favor muéstrame cómo preparas". Anotar "SI" si lo hace correctamente. Anotar "NO", en caso de que cometa errores.

6. "Puedes mostrarme cómo preparas suero casero; si o no. En caso negativo, verificar porqué, anotar no, y continuar con la siguiente pregunta (#7).

"Qué necesitas?" Entregarle azúcar y sal, en caso de que los mencione.

Por favor, muéstrame cómo lo preparas". Anotar solamente si mide correctamente el azúcar, la sal y el agua. Correcto?, anotar si o no.

7. Preguntar a la madre: "si alguno de sus niños ha tenido diarrea?" En el caso en el que hubiese tenido ". . ." preguntarle " le dio (o le debe dar) más líquido que lo acostumbrado"; si o no.
8. Ha asistido a sesiones educativas de CARE? Si dice "No, anotar 0". En caso afirmativo, "cuándo fue la última vez?", mes actual "1", mes anterior "2", etc., etc.
9. Porque es importante lavarse las manos?

Quando es importante lavarse las manos?

Si dice 1 de las siguientes, escriba 1, si dice 2, escriba 2, si dice 3, escriba 3:

antes de preparar la comida
antes de comer
despues de hacer sus necidades

La Paz, marzo de 1990
CR/vip.

M A D R E

Comunidad: _____ Código: _____ Departamento: _____

Fecha: _____ Entrevistador: _____

! Capacitación!

1. No.	2. Nombr Mujer	3a Agua Hay?	b Dom.? B/M/U	4a Letr. Hay?	4b Dom.? B/M/U	5. Mues. SRO Si/No	6. Mues. SC Si/No	7. C. Liq. Diarrea	8. Ultima Reunión	9. Higiene
1										
2										
3										
4										
5										
6										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Observaciones: _____

GUIA INSTRUCTIVA

PARA EL LLENADO DEL FORMULARIO PARA EL NIÑO

1. Anotar el número que corresponda a su madre, el que se le asignó en la guía para la madre.

2. Anotar nombre del niño

Del carnet:

3. Anotar fecha, mes y año de nacimiento "25/10/89"

4. Anotar sexo del niño "M" masculino
"F" femenino

5. Anotar el último peso. Anotar también los gramos.
Ejemplo: 8.6; 10.0

6. Anotar peso correspondiente al mes anterior; en caso de no haberse realizado, marcar "NA".

7. Indicar el último mes en que fue pesado el niño. Anotar la fecha. "NA" = no se peso al niño.

8. Indicar el color de lana que se le puso al niño.

9. Preguntar a la madre: "Cual es el significado de esta lana?" Calificar su respuesta como "S" = correcto. "N" = incorrecto. "NA" = no aplicable, el niño no tenía colocada la lana.

10a. A partir de que edad le dio a su niño comiditas or alimentación complementaria" Escribe el número e la mes.

10b. Toma agua su niño? Si o no. Como le da sin hervir o hervida? Escribe si es hervida.

11. Preguntar a la madre "Si el niño tuvo tos or catarro durante las dos últimas semanas pasadas" Anotar "N" si dice no. En el caso que indique si, anotar "S". Averiguar que le dio y que hizo para que mejore el niño. Anotar lo más esencial e importante de sus respuestas en observaciones., tomando en cuenta el número correlativo que corresponda a la madre.

12. Preguntar a la madre "este niño ha tenido diarrea en las dos últimas semanas? Si o no

13. Preguntar a la madre "Que le dio cuando estuvo con diarrea?"

Anotar "SR" = suero rehidratacion; "SC" - suero casero;
"M" = mates; "A" ^{otros} ~~otres~~ ^{liquidos} ~~liquidos~~ "N" casi nada de liquidos en
13b. Anotar comida y lactancia materna en 13a.

Si no dice comida o lactancia materna, preguntar si dar
comida y lactancia materna cuando el nino tiene diarrea es
bueno o mal.

14. Blanco

15 a 18. Revisar el libro de control con el de carnet de
salud, cualquier data que pareciese veras, anotar el numero
de cada tipo de inmunizacion que se haya dado al nino: de 0
a 4.

N I N O

Comunidad: _____ Códigos: _____ Departamentos: _____ Fecha: _____ Entrevistador: _____

1. No. Madre	2. Nombre	3. Fecha Mes y Año ND	4. Sexo	5. Feso	6. Feso Mes Antr.	7. Ultima vez q' fue pd	8. Lana? V/A/R	9. Mdr Con Sig. len SI/NO	10. La da coada SI/NO	11. Ult29 ISA? SI/NO	12. Ult29 Diarr? SI/NO	13a Lo dio Lch Nln dur dr SI/NO	13b Tratmto "SR/CS/M/A/N"	14. Lo Hz Corr? SI/NO	15. DPT 0-4	16. Pu-lio 0-4	17. Car 0-2	18. ECC 0-1

116

Observaciones: _____

ANNEX C

LIST OF PERSONS INTERVIEWED

CARE/ La Paz (National and Regional)

Frank Sullivan, Director
Chris Roesel, Project Manager
Swaleh Karanja, Sub-Director
Steve Hollingsworth, Sub-Director
Jaime Paz Noriega, Chief Engineer
Jorge Ponce S., Technical Assistant, Water
Gonzalo Ramirez C., Technical Assistant, Health
Olga Paco, Supervisor
Julieta Paco, Supervisor
Dr. Mary Ruth Horner, Chief of Health Programs, CARE/New York

CARE Regional Offices

Carlos Cassis, Engineer, Technical Assistant, Water, Tarija
Heidi Brieger, Technical Assistant, Social, Tarija
Nancy Lizondo, Technical Assistant, Social, Chuquisaca
Freddy Murillo, Engineer, Regional Administrator, Potosi
Rosario Villarpendo, Supervisor, Potosi
Lucio Coria, Technical Assistant, Health, Potosi
Victor Rico, Engineer, Regional Administrator, Oruro
Benigna Condori, Supervisor, Oruro

La Paz Development Corporation (CORDEPAZ)

Guery Lozada, Engineer, Chief of Water Resources (Recursos Hidricos)
Jaime Cejas, Engineer, former Chief of Water Resources
Dani Gonzales, CORDEPAZ-CARE Coordinator, Omasuyos Province
Guillermo E. Tesan, Project Physician
Wilma Montesinos, Project Engineer

Tarija Development Corporation (CODETAR)

Javier Castellanos, Engineer, Director of the Department of Water Resources (Recursos Hidricos)

Potosi Development Corporation (CORDEPO)

Javier Pary, Engineer, Technical Manager
Franz Velasco, Engineer, Water Resources
Rolando Ochoa, Project Coordinator

Oruro Development Corporation (CORDEOR)

Miguel Vargas Mujica, Engineer, President
Fernando Subieta, Engineer, General Manager
Juan Lizarazu, Engineer, Chief of Water Resources

Regional Health Units (Unidades Sanitarias)

Tarija

Julio Pizarro, Director

Carlos Barrero, District Director

Pastor Borda B., Director, Maternal/Child Health and Project Coordinator

Jorge Chamon Adad, Chief, TB Project

Potosi

Dr. Carlos Pacheco, Director

Dr. Rita Prieto, Director, Maternal/Child Health

David Chocete, Maternal/Child Health

Oruro

Dr. Roberto Nunez, Director

Dr. Alfredo Bohorquez, Chief, Epidemiology Department

Dr. David Choque, Chief, Planning Department

Dr. Israel Ramirez, Chief, Rural Expanded Immunization Program

Community Persons Interviewed (Number)

20 Promoters

14 Operators

124 Community Leaders and Water Committee Members

120 women and 3 men (community participation family questionnaire)

57 women (health questionnaires)

USAID/ Bolivia

Paul Hartenberger, Chief Health and Human Resources Office

Lance Downing, Manager, Evaluation Office

John Davison, Controller

Charles Llewellyn, Health Project Manager

Rafael Indaburo, Engineer (previous Project Manager)

John Cloutier, Project Development & Implementation Office

Matt Cheney, Engineering Consultant

Joel Kuritsky, M.D., Epidemiologist

Ministry of Planning

Guillermo Davalos, Sociologist

Ministry of Health

Dr. Mario Paz Zamora, Doctor

Dr. Mario Pommier, Director, Maternal/Child Health

Dr. Fernando Finot, Chief, Maternal/Child Health

CIEC

Raul Bohrt, Research Associate

ANNEX D

ITINERARY OF THE EVALUATION TEAM

The three-person evaluation team was in Bolivia to work on the Project Final Evaluation from March 5th through March 31st, 1990. The Team Leader remained in Bolivia until April 7, in order to respond to USAID and CARE comments on a semi-final draft of this report (the present report reflects their comments).

During the period from March 8th through March 23rd, 1990, the evaluation team inspected project accomplishments in 20 communities. This included 17 communities visited by the three-person primary evaluation team, and three communities (all in Tarija) where a supplementary team of two employees of USAID/Bolivia used the interview forms provided by the primary evaluation team (the supplementary team also accompanied the primary team in the first communities visited, all in the Department of La Paz).

LIST OF COMMUNITIES VISITED:

La Paz

Compi Central
Chua Jichupata
Ajlla Pata Pata
Maquelaya

Tarija

San Isidro
Chalamarca
Canas Moro
La Pintada
Tomatas Grande

Chuquisaca

El Monte
1o de Mayo
Andamarca
Usfamayu

Potosi

La Palca
Santa Lucia
Cayara
Ockoruro

Oruro

Sajsani
San Miguel
Nueva Llallaguas

ANNEX E

PROJECT INFORMATION SYSTEM

The following chart shows the flow of information and the instruments used at each level of health worker:

Person	Instrument Used	Data Collected
Mother	Road to Health Card	Name of Child Birthdate Sex Dates of Immunizations Weights for Age & Date Yarn Color Illnesses
Promoter	Road to Health Card	Name of Child Birthdate Sex Dates of Immunizations Weights for Age & Date Yarn Color Illnesses
	Monthly Calendar	Dates of Meetings Ed. lectures given Home Visits No people in each
	Diarrheal Incidence Report Form	Name & Age of Child #Days of Diarrhea Grade of Diarrhea Results #ORS pkts. used #L. suero casero used
	Birth Register	Name, Birthdate & Sex
	Death Register	Name, Birthdate & Sex Date & Cause of Death
Promoter & Supervsr.	Follow-up of High Risk Children	Name, sex, age of child Name of Person Visiting Dates of Home Visits Results

Person	Instrument Used	Data Collected
Supervsr.	Notebook (ongoing)	Name of Child Date of Birth Sex Dates of Immunizations Weights for Age & Date Yarn Color
	Capacitation of Mothers (ongoing)	Name & Age of Mother Date of Completed Exam
	Diarrheal Incidence Report Form (monthly)	By Community: # <5 # with card # carrying card* # weighed Yarn color # & grade dehydration results of rx of above #ORS pkts. used #L. svero casero used # Children at Risk # Extensionists
	Education Report Form (monthly)	By Community: Theme Materials Used # houses visited Name of Group Person giving talk # people attending # extentionists
	Monthly Activities Report Form (2 parts compared at end of month)	By Community: Plan w/ dates filled at beginning of month Activities accomplished completed at end of mo.
	Vaccination Report Form (per campaign)	# doses of each type vaccine given by age and by community

Person	Instrument Used	Data Collected
	Quatrimestral Report	By Community: Number of gardens For sindicato & mothers' club reported separately: Number of meetings No. at last meeting Activity at last meeting No. Children weighed No. <5 Fully Vaccinated # Births M & F # Deaths by Sex & Age
	Narrative Report (monthly)	organized by community or by sector
Technical For Unidad Sanitaria: Assistants	SVEN	consolidated growth monitoring report
	Vaccination Report	vaccines administered by date and type
	Morbidity Report	cases, severity, treatment and outcome of ARI and diarrhea
	For Project Manager: Quatrimestrial Reports	
Project Manager	PIE (Project Information and Evaluation Reports) for country director and CARE New York office	

REPORTE DE ACTIVIDADES DE VACUNACION

(Noviembre 1989 - Febrero 1990)
POR DEPARTAMENTOS

COMUNIDAD	ANTIPOLIO			TRIPLE:			REF.	ANTI			BCG.			TOTAL NIROS								
	DOSIS: 1	2	3	1	2	3		SARA	PION	5-15	T.T.	VACUN.	ESQ.C	NIROS	CON							
EDAD: < 1	1-4	< 1	1-4	< 1	1-4	< 1	1-4	< 1	1-4	< 1	1-4	< 1	1-4	5-15	T.T.	VACUN.	ESQ.C					
* DEL MES: November																						
: DEPARTAMENTO: CHUQUISACA																						
: Subsubtotal :																						
	10	4	12	3	4	5	21	6	3	13	4	6	9	14	5	8	7	12	0	8	70	0
: DEPARTAMENTO: DRURO																						
: Subsubtotal :																						
	3	3	6	9	1	7	28	1	2	2	6	2	6	10	2	8	0	0	0	2	62	0
: DEPARTAMENTO: POTOSI																						
: Subsubtotal :																						
	10	0	4	0	11	7	7	9	0	7	0	7	8	7	4	7	14	15	26	9	33	14
: DEPARTAMENTO: TARIJA																						
: Subsubtotal :																						
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	57	133	0	0	0
## Subtotal ##																						
	23	7	22	12	16	19	56	16	5	22	10	15	23	31	11	23	45	84	159	19	165	14
* DEL MES: December																						
: DEPARTAMENTO: CHUQUISACA																						
: Subsubtotal :																						
	24	3	16	12	8	35	94	21	6	20	10	5	35	86	9	32	14	44	0	80	211	0
: DEPARTAMENTO: LA PAZ																						
: Subsubtotal :																						
	5	2	0	2	1	9	0	5	2	0	1	1	6	0	3	3	2	8	0	4	28	179
: DEPARTAMENTO: DRURO																						
: Subsubtotal :																						
	39	7	14	8	11	19	43	26	5	10	8	11	14	19	11	35	22	28	6	34	166	0
: DEPARTAMENTO: POTOSI																						
: Subsubtotal :																						
	3	0	7	0	4	5	20	5	1	7	0	1	3	20	2	7	9	9	12	4	42	1
## Subtotal ##																						
	71	12	37	22	24	68	157	57	14	37	19	18	58	125	25	77	47	89	18	122	447	180
* DEL MES: January																						
: DEPARTAMENTO: CHUQUISACA																						
: Subsubtotal :																						
	0	2	14	6	5	11	14	8	2	10	10	6	12	14	3	16	12	28	0	16	79	0

REPORTE DE ACTIVIDADES DE VACUNACION

(Noviembre 1989 - Febrero 1990)
POR DEPARTAMENTOS

COMUNIDAD	ANTIPOLIO			REF.	TRIPLE:			REF	ANTI SARA PION		BCG.			TOTAL NIÑOS									
	DOSIS: 1	2	3		1	2	3		1	1-4	1	1-4	1	1-4	5-15	T.T.	VACUN. ESG.C						
EDAD: < 1	1-4	< 1	1-4	< 1	1-4	< 1	1-4	< 1	1-4	< 1	1-4	< 1	1-4	5-15	T.T.	VACUN. ESG.C							
DEPARTAMENTO: LA PAZ																							
: Subsubtotal :	18	4	16	8	4	6	13	16	3	16	8	5	6	12	8	15	27	47	16	6	46	168	
DEPARTAMENTO: ORURO																							
: Subsubtotal :	15	11	3	8	2	5	6	9	8	2	4	2	5	2	1	14	13	22	1	1	56	0	
DEPARTAMENTO: TARIJA																							
: Subsubtotal :	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
: Subtotal :	42	19	35	22	11	22	33	33	13	28	22	13	23	28	12	45	52	97	17	23	181	168	
DEL MES: February																							
DEPARTAMENTO: ORURO																							
: Subsubtotal :	10	3	0	6	3	3	2	8	2	0	5	3	3	2	1	7	8	9	0	0	15	0	
DEPARTAMENTO: TARIJA																							
: Subsubtotal :	36	8	20	17	53	25	221	26	7	21	16	29	27	57	20	35	14	54	0	66	0	0	
: Subtotal :	46	11	20	23	56	28	223	34	9	21	21	32	30	59	21	42	22	63	0	66	15	0	
: Total :	182	49	114	79	107	137	469	140	41	108	72	78	134	243	69	187	166	333	194	230	808	362	

REPORTE DE CAPACITACION DE LA MUJER

(NOVIEMBRE/89 - FEBRERO/90)

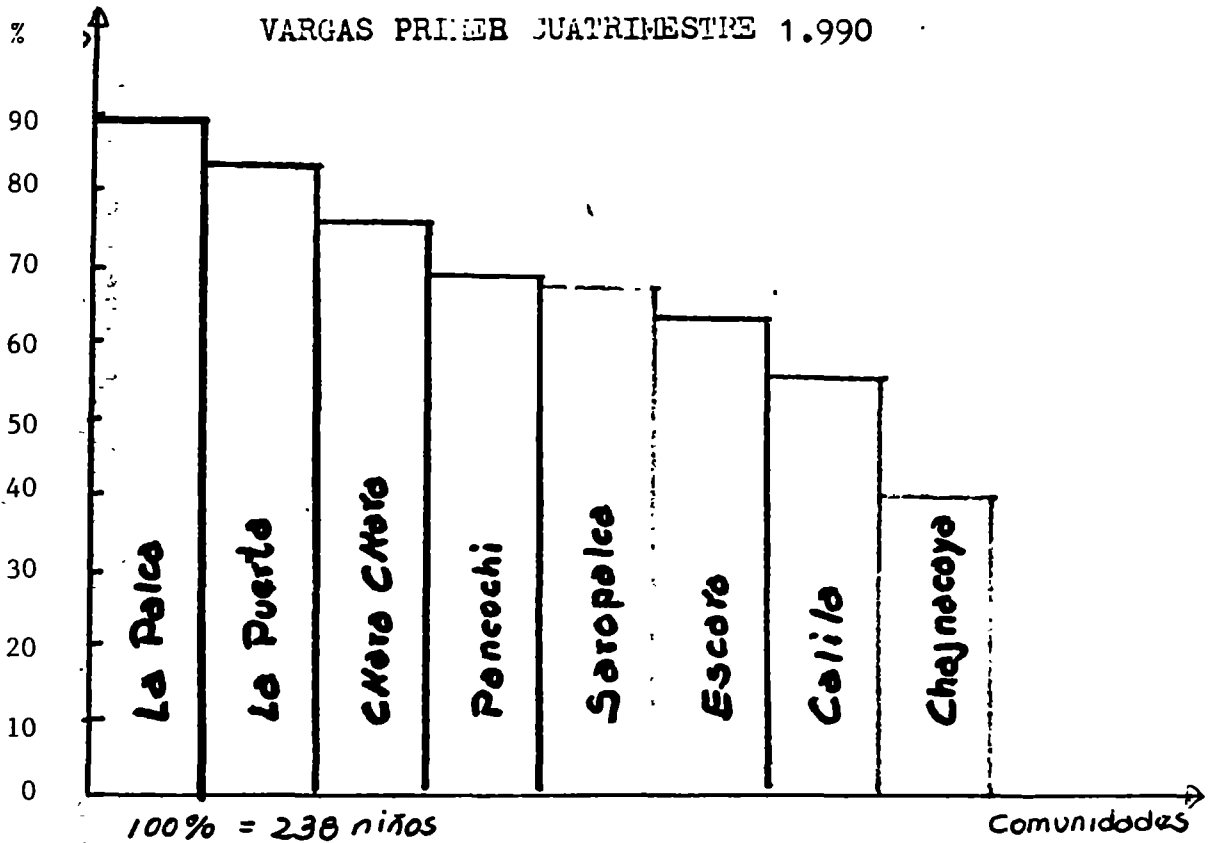
EN CAPACITADAS									CON
CLUB MADRES	EN: HIGIENE	DIARREA	LACTAN. USD SRO	NUTRIC. MATERNA	CARNET SALUD	USO DE BOCIO	LETRIN.	ESQUEM. COMPLETO	
** DEL MES: November									
§ DEPARTAMENTO CHUQUISACA									
§ Subsubtotal §									
1018	86	82	137	82	94	106	119	11	22
§ DEPARTAMENTO ORURO									
§ Subsubtotal §									
821	80	89	93	61	78	69	42	47	8
§ DEPARTAMENTO POTOSI									
§ Subsubtotal §									
613	43	66	43	75	69	56	55	35	50
** Subtotal **									
2452	209	237	273	210	241	231	216	93	80
** DEL MES: December									
§ DEPARTAMENTO CHUQUISACA									
§ Subsubtotal §									
755	58	37	38	68	51	67	40	18	28
§ DEPARTAMENTO ORURO									
§ Subsubtotal §									
808	97	92	94	83	103	81	51	59	28
§ DEPARTAMENTO POTOSI									
§ Subsubtotal §									
739	73	63	13	72	55	28	45	45	56
** Subtotal **									
2302	228	192	145	223	209	176	136	122	112
** DEL MES: January									
§ DEPARTAMENTO CHUQUISACA									
§ Subsubtotal §									
768	71	73	60	72	124	56	68	0	217
§ DEPARTAMENTO ORURO									
§ Subsubtotal §									
818	114	100	105	86	94	74	58	60	23
§ DEPARTAMENTO POTOSI									
§ Subsubtotal §									
712	37	55	64	62	84	53	71	25	97

REPORTE DE CAPACITACION DE LA MUJER

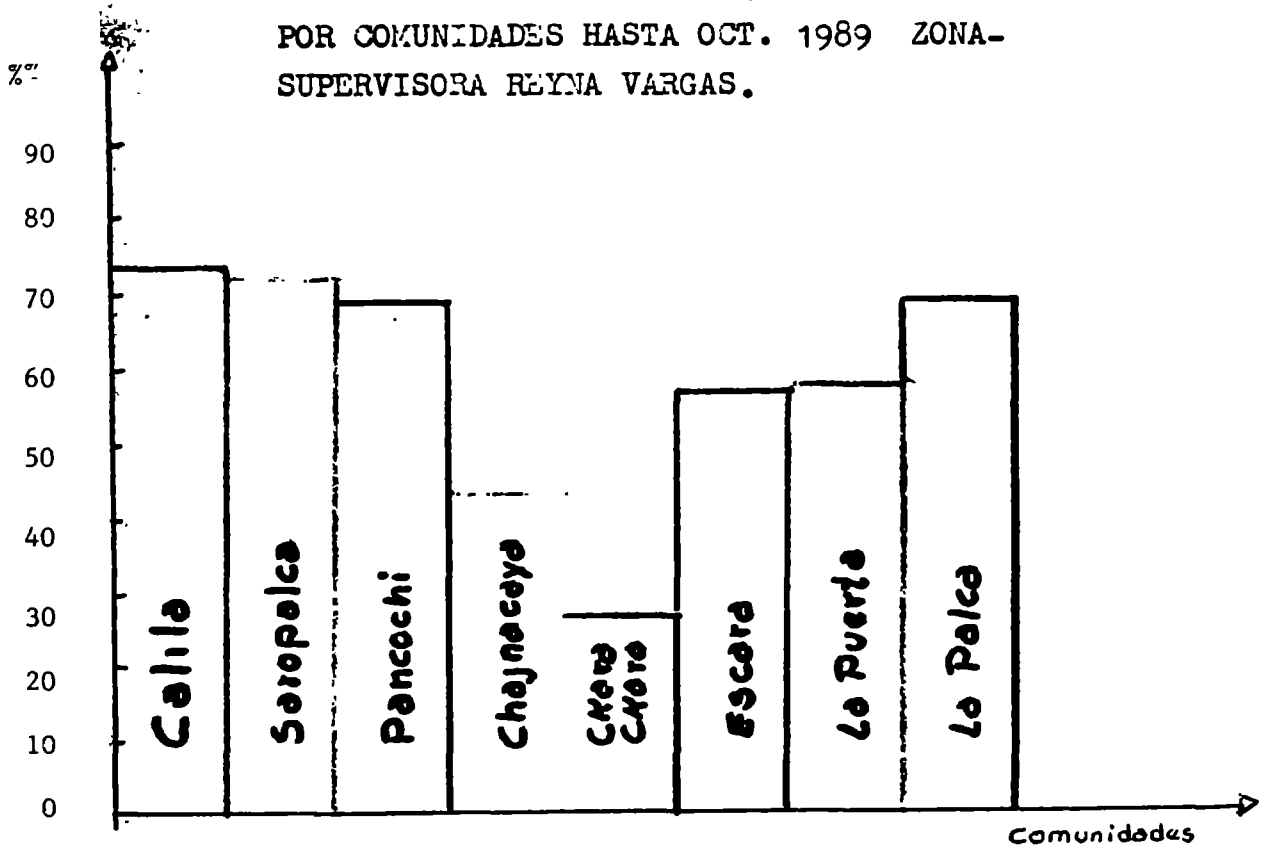
(NOVIEMBRE/89 - FEBRERO/90)

EN CAPACITADAS									CON
CLUB	EN:	DIARREA	LACTAN.	NUTRIC.	CARNET	USO DE	ESQUEM.		
MADRES	HIGIENE	VACUNAS	USD SRD	MATERNA	DIETAS	SALUD	BOCID	LETRIN. COMPLETO	
** Subtotal **									
2298	222	228	229	220	302	183	197	85	337
** DEL MES: February									
* DEPARTAMENTO LA PAZ									
* Subsubtotal *									
263	858	815	779	750	805	791	724	808	396
* DEPARTAMENTO POTOSI									
* Subsubtotal *									
298	28	24	33	26	36	37	37	25	79
* DEPARTAMENTO TARIJA									
* Subsubtotal *									
131	141	141	105	119	163	127	118	145	195
** Subtotal **									
692	1027	980	917	895	1004	955	879	978	670
*** Total ***									
7744	1686	1637	1564	1556	1756	1545	1428	1278	1199

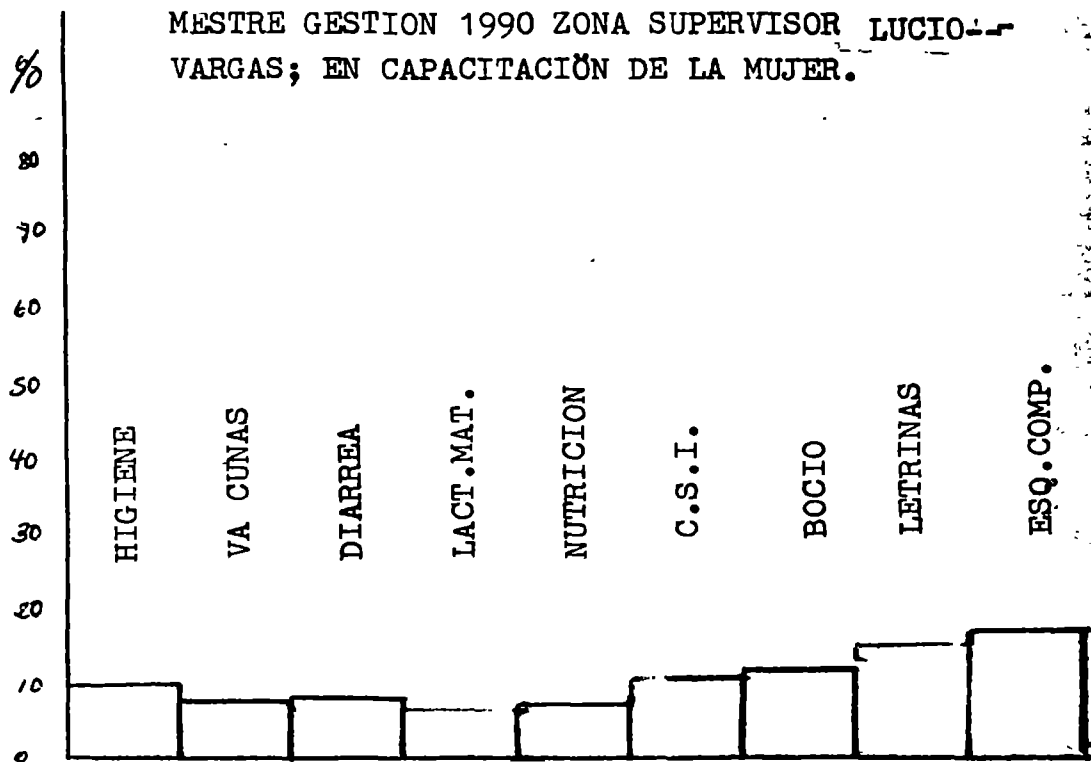
PROMEDIO DE NIÑOS QUE HICIERON CONTROL DE PESO ZONA DE LA SUPERVISORA REYNA VARGAS PRIMER CUATRIMESTRE 1.990



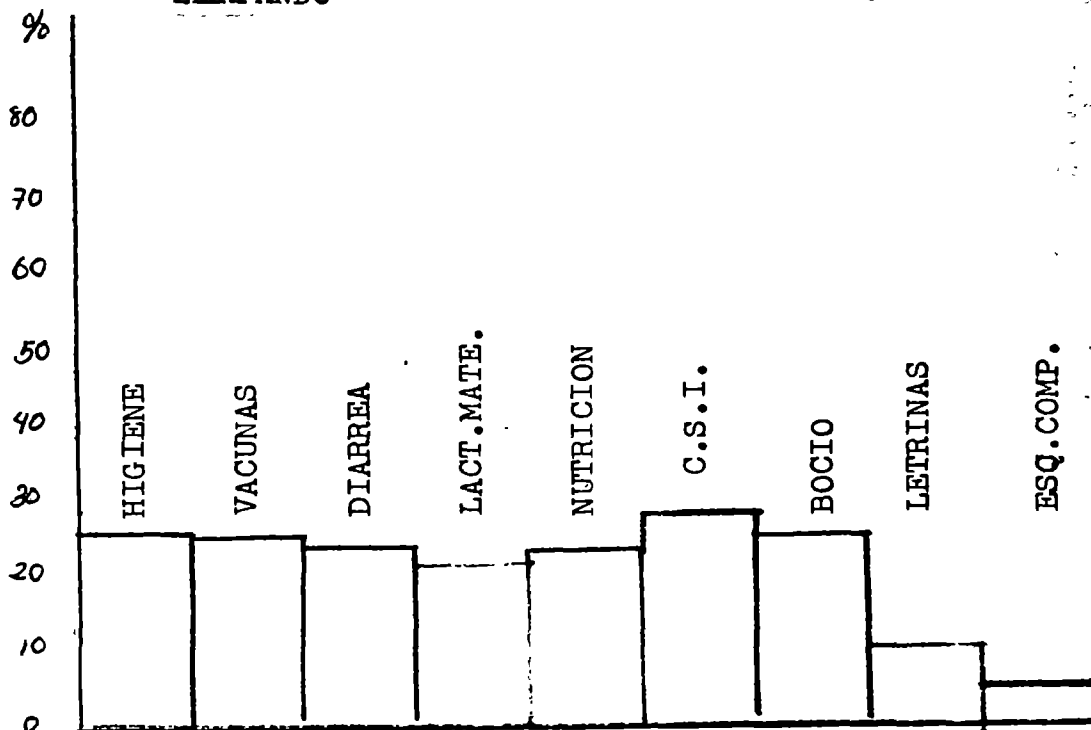
NIÑOS INMUNIZADOS CON ESQUEMA COMPLETO POR COMUNIDADES HASTA OCT. 1989 ZONA SUPERVISORA REYNA VARGAS.



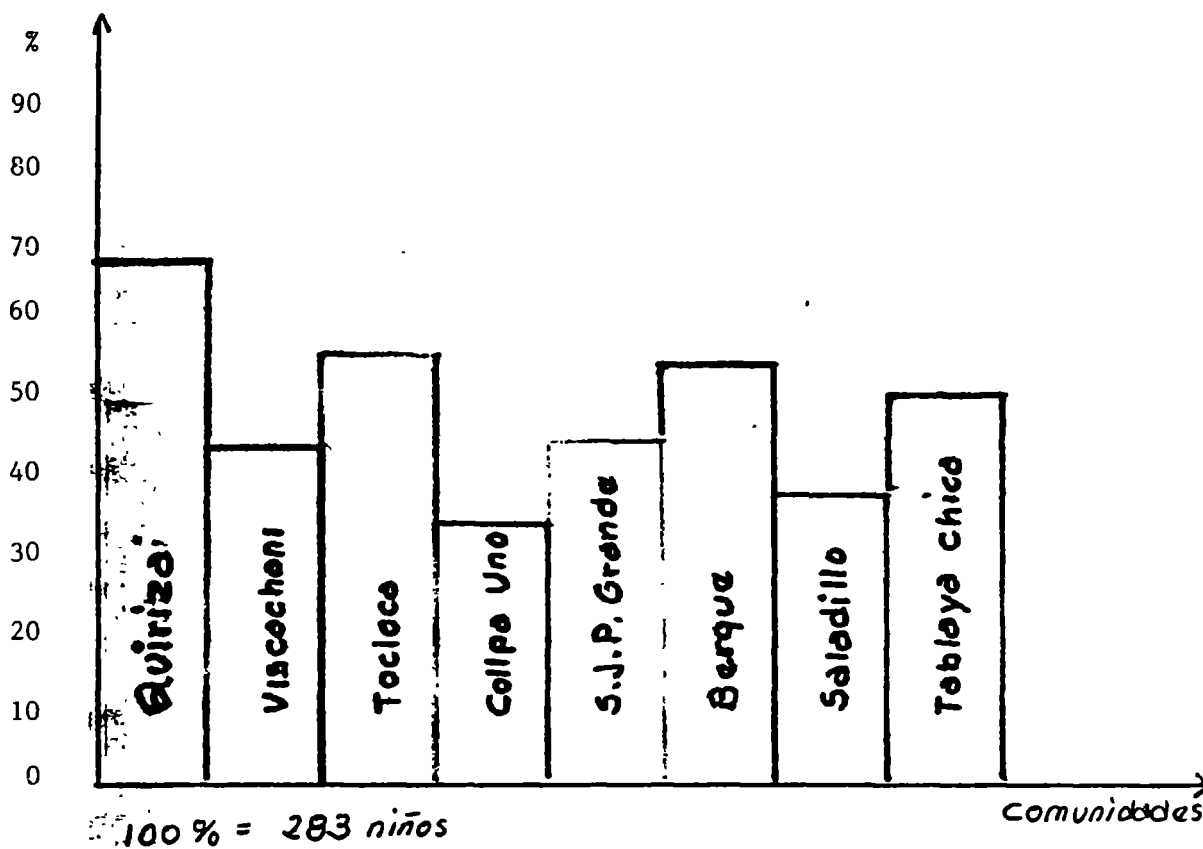
COBERTURA ALCANZADA DURANTE EL PRIMER CUATRIMESTRE GESTION 1990 ZONA SUPERVISOR LUCIO VARGAS; EN CAPACITACION DE LA MUJER.



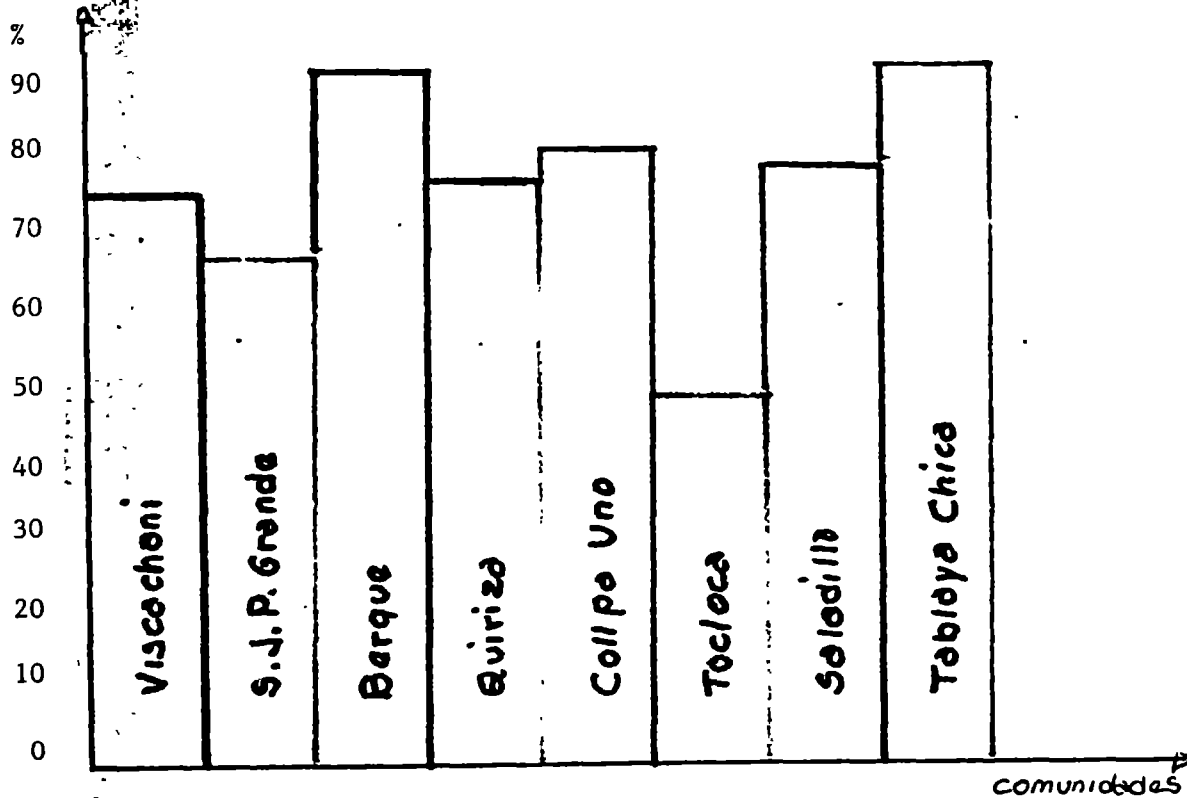
COBERTURA ALCANZADA DURANTE EL PRIMER CUATRIMESTRE GESTION 1990, ZONA SUPERVISORA ROSARIO VILARPANDO EN CAPACITACION DE LA MUJER.



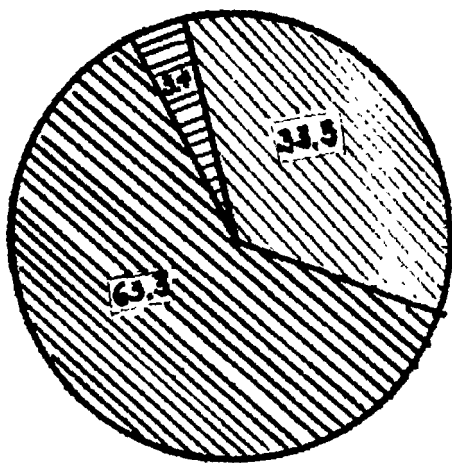
PROMEDIO DE NIÑOS QUE HICIERON SU CONTROL DE PESO DURANTE EL PRIMER CUATRIMESTRE DE 1990 ZONA DEL SUPERVISOR MELITON CABRERA.



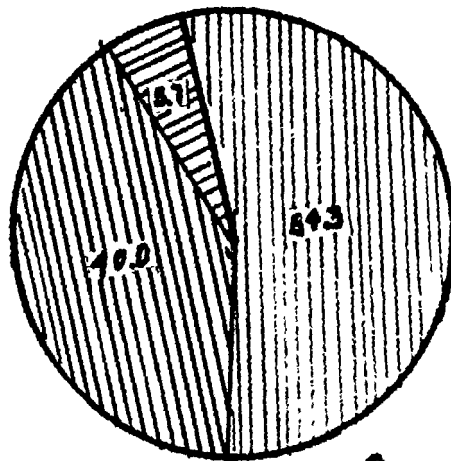
NIÑOS INMUNIZADOS CON ESQUEMA COMPLETO HASTA OCT.89 ZONA MELITON CABRERA.



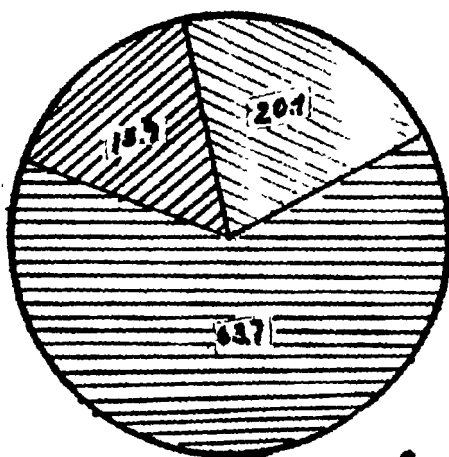
NIÑOS EN RIESGO CON SEGUIMIENTO POR CAUSA PORCENTAJE.



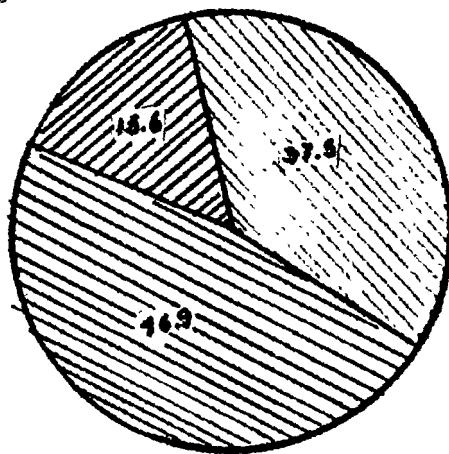
Julio^{VII} 89



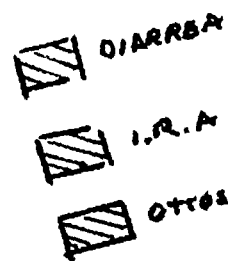
Agosto^{VIII} 89



Septiembre 89



Octubre 89



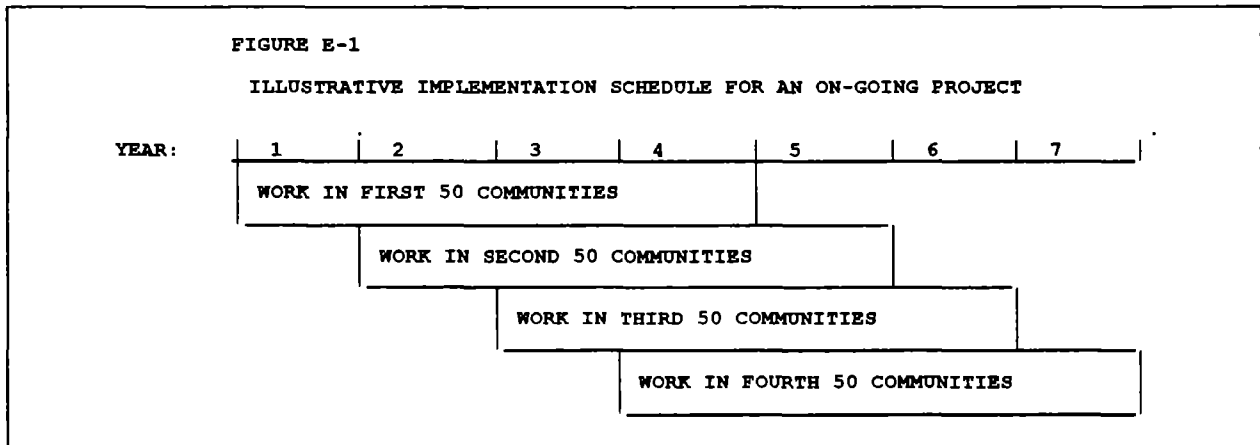
ANNEX F

ILLUSTRATIVE SCHEDULE FOR ON-GOING IMPLEMENTATION OF INTEGRATED WATER AND SANITATION/CHILD SURVIVAL PROJECTS

Development of project proposals and implementation schedules is outside of the scope of work of the evaluation team, and should be undertaken in conjunction with the funding agency, the executing agency, and counterpart institutions. Nonetheless, the concepts presented in this Annex may provide some useful ideas for discussion among such agencies and institutions.

For the reasons explained below, projects for water, sanitation and health should optimally have a duration of at least seven years.

If, for instance, such a seven-year project were to serve a total of approximately 200 communities, then the following might represent a rough implementation schedule. This schedule is based on interventions in each community spanning a period of approximately four-years, as described in the latter part of this Annex.



Interventions related to water supply, sanitation, and health, are all ongoing in nature. It is inappropriate to try to have permanent impacts via short-term community-level sub-projects which try to start-up quickly and then come to an abrupt halt one or two years later.

There are a number of advantages to scheduling implementation, as indicated in the above diagram, such that every year a project begins work in a new group of communities, while continuing its work in communities where it began in previous years. These advantages include:

- A. The critical tasks that need to be undertaken during the first year in each community (including measuring of water source flows near the end of the dry season) can be staggered over the first four years of the project, with these tasks undertaken in 25 percent of the communities each year. This allows for optimal scheduling of personnel time.
- B. The project team can learn via experience, and what they learn about specific project tasks each year can be applied in subsequent years in other communities.
- C. The project can scale-up to full-scale activity over a period of years, thus avoiding the need

to almost instantly reach maximum levels of activity. This should facilitate management of the project.

- D. After the first five years of the project, if there is NOT to be a follow-on project, a phasing-down period can begin. This can avoid the need to suddenly disband all project staff.
- E. After the first five years of the project, if there WILL be a follow-on project, the new project can phase-up as the old project phases-down, and the need to make drastic changes in the size of the total staff for the two projects can be avoided. Also, the possible need to "bridge" over a time gap between the original project and the follow-on project is minimized, since the two projects can overlap.
- F. A mid-term evaluation at the end of the first four years will be able to evaluate the FINAL results of project activities in 25 percent of the communities served. Such information will be very useful in the remaining communities being served by the project. It would also be very useful if at that time consideration be given to creating a second overlapping project, which would be phased-up as the original project is phased-down.
- G. If construction materials must be imported, this would be facilitated. This is because initially an order could be placed for an approximate estimate of the materials needed for 50 percent of the communities, instead of for 100 percent. Because only 25 percent would be needed for communities where work is initiated during the first year, it would be probable that the project would not run out of most of the types of materials needed for communities served during the first year. In each succeeding year, materials could be ordered for 25 percent of the communities, with the new order taking into account both the remaining inventory of materials, and the experience of the previous year in terms of the actual materials that were required.
- H. Each year, in each department of the country that is being served, the project could evaluate the performance of its counterpart institutions. If in a given department it appears that a counterpart cannot stay on schedule or cannot serve the indicated number of communities, then the project could reduce the number of communities in which work is to begin in that department in the following year. The funding that would have been applied to such communities can be transferred to another department. Knowledge of this possibility may serve as leverage to pressure each counterpart to perform at its best.

Within the four years dedicated to each community (plus a fifth year for evaluation), the following might be a rough implementation schedule:

ILLUSTRATIVE IMPLEMENTATION SCHEDULE WITHIN EACH COMMUNITY:

1st year in each community:

- The project first must select potential beneficiary communities where further evaluation will take place.
- Introduce the project to each community, including discussions with community leaders.

- Evaluate community resources and needs, and undertake a local census.
- Determine technical and economic feasibility for the water supply (this must include measurement of the source flow near the end of the dry season).
- Undertake a study of social factors in each community.
- Begin community organization activities.
- Come to agreement about the community's participation in the project, including making of a down-payment by the community for its contribution to the project.
- Begin design of the water project, including the required surveying.
- Evaluate the potential for construction of a micro-irrigation project.
- Begin health education activities, including training for oral rehydration therapy (ORT).
- Begin vaccination program.

2nd year in each community:

- Complete design of the water project.
- Complete design of micro-irrigation project (if any).
- Order construction materials.
- Begin construction of the water and sanitation facilities.
- Continue health education activities.
- Begin growth monitoring of infants.
- Continue community organization activities.

3rd year in each community:

- Complete construction of water and sanitation facilities.
- Complete construction of micro-irrigation project (if any).
- Continue health education activities.
- Continue vaccination program.
- Continue community organization activities.

4th year in each community:

- Operation and maintenance of water and sanitation facilities.
- Operation and maintenance of micro-irrigation project (if any).
- Correction of any construction errors.
- Continue health education activities.
- Continue vaccination program.
- Continue community organization activities.

5th year in each community:

- Evaluate the results of the project in each community (functioning, utilization, and impact). This may be an internal project evaluation undertaken by project staff.

3

Camp Dresser & McKee International Inc.
Associates in Rural Development, Inc.
International Science and Technology Institute
Research Triangle Institute
University Research Corporation
Training Resources Group
University of North Carolina at Chapel Hill

WASH Operations Center
1611 N. Kent St., Room 1001
Arlington, VA 22209-2111
Phone: (703) 243-8200
Fax: (703) 525-9137
Telex: WUI 64552
Cable Address: WASHAID

THE WASH PROJECT

With the launching of the United Nations International Drinking Water Supply and Sanitation Decade in 1979, the United States Agency for International Development (A.I.D.) decided to augment and streamline its technical assistance capability in water and sanitation and, in 1980, funded the Water and Sanitation for Health Project (WASH). The funding mechanism was a multi-year, multi-million dollar contract, secured through competitive bidding. The first WASH contract was awarded to a consortium of organizations headed by Camp Dresser & McKee International Inc. (CDM), an international consulting firm specializing in environmental engineering services. Through two other bid proceedings since then, CDM has continued as the prime contractor

Working under the close direction of A.I.D.'s Bureau for Science and Technology, Office of Health, the WASH Project provides technical assistance to A.I.D. missions or bureaus, other U.S. agencies (such as the Peace Corps), host governments, and non-governmental organizations to provide a wide range of technical assistance that includes the design, implementation, and evaluation of water and sanitation projects, to troubleshoot on-going projects, and to assist in disaster relief operations. WASH technical assistance is multi-disciplinary, drawing on experts in public health, training, financing, epidemiology, anthropology, management, engineering, community organization, environmental protection, and other subspecialties.

The WASH Information Center serves as a clearinghouse in water and sanitation, providing networking on guinea worm disease, rainwater harvesting, and peri-urban issues as well as technical information backstopping for most WASH assignments.

The WASH Project issues about thirty or forty reports a year. *WASH Field Reports* relate to specific assignments in specific countries; they articulate the findings of the consultancy. The more widely applicable *Technical Reports* consist of guidelines or "how-to" manuals on topics such as pump selection, detailed training workshop designs, and state-of-the-art information on finance, community organization, and many other topics of vital interest to the water and sanitation sector. In addition, WASH occasionally publishes special reports to synthesize the lessons it has learned from its wide field experience.

For more information about the WASH Project or to request a WASH report, contact the WASH Operations Center at the above address.