PD-AAS-580 43138

CLASSIFICATION

PROJECT EVALUATION SUMMARY (PES) — PART I

Report Symbol U-447

1. PROJECT TITLE	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
Disaster Recovery Project: CARE/AID Mid-Term Evaluation of CARE Potable Water/ Irrigation	511-0581	USAID/Bolivia

4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) 85-11

☒ REGULAR EVALUATION ☐ SPECIAL EVALUATION

5. KEY PROJECT IMPLEMENTATION DATES			6. ESTIMATED PROJECT FUNDING	7. PERIOD COVERED BY EVALUATION
A. First PRO-AG or Equivalent FY 83	B. Final Obligation Expected FY 85	C. Final Input Delivery FY 86	A. Total $ _____ B. U.S. $ 1,750,000 (Subcomponent)	From (month/yr.) 10/83 To (month/yr.) 01/85 Date of Evaluation Review 06/85

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE. Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
In January 1985, a joint CARE/USAID evaluation of the project was conducted. The evaluation was designed to measure the general progress of the subproject. The evaluation made four major recommendations: 1. The subproject should use an improved water system design to achieve increased sanitation and expanded water availabilities. 2. The project should increase community understanding between potable water and sanitary feces disposal and the need for patio to kitchen sanitation. 3. The level of participation of the Departmental Development Corporations in the implementation of this subproject should be examined further in terms of their ability to solve field problems and their compliance with agreements with CARE. 4. CARE should acquire a more extensive working knowledge of USAID reporting and accounting procedures and regulations.	SKMiller PRD (USAID/Bolivia)	Continuing

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

- ☐ Project Paper
- ☐ Financial Plan
- ☐ Logical Framework
- ☐ Project Agreement
- ☒ Implementation Plan e.g., CPI Network
- ☐ PIO/T
- ☐ PIO/C
- ☐ PIO/P
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

- A. ☒ Continue Project Without Change
- B. ☐ Change Project Design and/or ☐ Change Implementation Plan
- C. ☐ Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)

Clearances:
DP:WJGarvelink: [signature]
DP:AAFunicello: [signature]
PRD:SKMiller: [signature] 12/27/85

12. Mission/AID/W Office Director Approval

Signature [signature]

Typed Name David A. Cohen, Director

Date

AID 1330-15 (3-78)

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43148

CARE/AID MID-TERM EVALUATION OF CARE POTABLE WATER/ IRRIGATION ACTIVITY WITHIN THE DISASTER RECOVERY PROJECT

(511-0581)

January 1985

- Art Flanagan (CARE)
- Alfredo Leon (CARE)
- Karen LeBan (USAID)
- Oswaldo Vega (USAID)

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I. INTRODUCTION:

On October 14, 1983 CARE signed a cooperative agreement with USAID for US$ 1,750,000. under the Disaster Recovery Project (No. 511-0581) in order to construct 110 potable water systems and/or small-scale irrigation facilities by the project completion date of October 12, 1985. In October 1984, CARE realized that certain budgetary line items had been over budgeted and these funds could be used to construct an additional 15 systems for a total of 125 water/irrigation systems. The financial plan was amended to allow for the importation of additional materials and approved by USAID in P.I.L. No. 2. The first year goal of 55 systems was met by January 1985.

In January 1985 a joint CARE/USAID community dialogue evaluation of the Project was conducted in order to measure the general progress of the Project, and identify expected and unexpected program trends which will enable modification of program components in order to achieve the stated purpose of this project - "to construct, rehabilitate and expand existing potable water/sanitation systems and irrigation facilities in order to provide for increased water supply and food production in drought affected areas of Bolivia." The evaluation is divided in four parts: a) Technical Considerations, b) Community Survey Results and Comments, c) Departmental Development Corporations, and d) Institutional Assessment of USAID and CARE.

II. TECHNICAL CONSIDERATIONS (See Appendix 1)

A random sample of 17 communities was selected biased toward time and location constraints of the evaluators. The following communities were selected:

Department of La Paz:	Sivicani, Catavi, Belen, Huaraca/Altipampa.
Department of Oruro:	Vichay Lupe, Avaroa, Copacabana.
Department of Potosí:	Paco Grande, Tecoya, Pampoyo, Belen/Pampa.
Department of Chuquisaca:	San José de Molley, San Antonio, Tinteros, Tambo, Siguayo.

The 17 communities surveyed represent 33.3% of the 51 functional systems constructed since the initiation of the USAID - CARE Disaster Relief Rural Water Supply Program. The sample size as compared to the total number of systems to be constructed (125) represents 13.6% of CARE's annual construction output for this program.

In all communities visited, the systems were ground water gravity, with PVC conduction networks that arrive to domestic (patio) connections. The irrigation system (Department of Chuquisaca) is an open cement canal system with a decline of 1 meter per 1000 meters of slope.

A. COMMUNITY ACCESS (See Appendix 2)

The distance between the departmental capital and the benefiting communities surveyed ranged from 18 kilometers to 162 kilometers.

In the department of Potosí benefiting communities were between 42 kilometers to 77 kilometers. To arrive in many of these communities 4 wheel drive trucks must be utilized and travel is at times difficult but in general all communities could be arrived at in 2 hours.

In the department of Chuquisaca, the surveyed communities were on an average closer to the capital city, most being between 18 and 55 kilometers. Road systems are good so arrival to benefiting communities wasn't as great a problem.

In Oruro the benefiting communities surveyed were isolated and ranged between 145 and 165 kilometers from the Capital. In order to survey the 3 AID beneficiary communities, AID and CARE staff spent 21 hours traveling and questioning community members.

B. BENEFITING POPULATION (See Appendix 3)

Approximately 6,063 inhabitants were serviced by the 17 surveyed systems with an average of 357 beneficiaries per community. The range of population density per benefiting community was from 205 to 504 beneficiaries. The following is a breakdown of the benefiting population by department.

	Number of Systems	Number of Beneficiaries
POTOSI	4	1,729
ORURO	3	1,220
LA PAZ	5	1,796
CHUQUISACA	5	1,318

C. IMPLEMENTATION DURATION (See Appendix 4)

The average actual construction time was 3 months. The average varies according to the size of the program, the commitment of the community to provide the local labor and materials, weather conditions, etc.

D. WATER CAPTATION TECHNIQUES AND PROCEDURES

Water was captured from 11 streams and 6 rivers. The structures constructed to capture these waters were constructed with cement, sand, and gravel with a mixture percentage of 1: 2: 4 and 40% rock and were constructed in accordance with "Griger" construction profile-design calculations

$$a = 0.5\ a\ H; \quad b = 0.7\ a\ 0.8\ H \quad \text{and} \quad c = ZA5H.$$

In order to capture these wasters, water catches constructed of concrete, rubber concrete, and filtered galeries were utilized.

E. CONDUCTION NETWORKS

The conduction networks of all potable water systems was conducted with PVC and the 1 irrigation system with open concrete canals. The total length of tubing laid in the 16 potable water systems was 23,037 meters, with an average of 1,440 meters per system.

The pressure resistance of the tube laid was 200 PSI and the union rings were 0 2 to 2 1/2 ". The diameter of the tubing employed was 14,161 meters of 0 2" PVC, 4,250 meters of 0 1", 2,626 of 0 2 1/2", and 2,000 meters of 0 1 1/2".

F. WATER STORAGE TANKS (See Appendix 5)

The storage tanks constructed vary in size from 5 m^3 to 20 m^3. All were constructed of concrete and rubber concrete utilizing a mixture percentage of cement, sand and gravel in the following proportion 1 : 2 : 4 and 40% rock.

The tanks are semi-under ground. In the area of Chuquisaca the tanks are covered with a protective tin roofed housing and in the other departments they are covered with a reinforced concrete top.

G. DISTRIBUTION NETWORK (See Appendix 6)

The PVC tubing distribution network were laid 0.80 meters below ground surface. The number of house taps installed range between 26 taps to 160 taps per community. The average house tap installation per community was 73.

H. WATER SUPPLY (See Appendix 7)

The quantity of water stored varied in accordance with needs of the community and available water sources. In the Altiplano areas the systems were calculated to provide between 60 to 80 liters per beneficiary and in the lower areas of Chuquisaca 100 liters per beneficiary.

I. COST (See Appendix 8)

The total cost (excluding CARE personnel and operations costs) for the construction of these 17 systems was US $ 112,053. However, this cost should not be used as a sample average because the systems surveyed are not an exact representative cost sample. Many other systems being built are significantly more expensive due to the distance of the water source to the storage tank facility and distance of the distribution networks of sparsely populated communities.

Cost Input Breakdown of 17 surveyed system

CARE - AID	=	US $ 79,166
CORPORATIONS	=	$ 10,206
COMMUNITIES	=	$ 22,681
		US $112,053

J. WATER QUALITY (See Appendix 9)

All communities surveyed had a water quality analysis which indicated that all were well within the potable safety standards of the World Health Organization.

TECHNICAL RECOMMENDATIONS

1. All designs made in a draft form should be drawn into a final draft form.

2. All future systems should utilize a reinforced concrete top to ensure sanitation.

3. HTH Treatment kits should be installed where bacteria is present in Water Storage tanks.

4. Water source in highland areas should be expanded to achieve an average supply 100 liters per beneficiary.

5. Sedimentary structured design should be utilized more to lower water turbulence.

6. The engineering integrity of the water systems should be further evaluated in terms of a) design, b) actual quantity of available water per person, c) water rationing, d) sustained operation and maintenance and e) expansion constraints.

III. COMMUNITY SURVEY RESULTS AND COMMENTS:

In each community, meetings of the community members were called and one to three interviews were taken depending upon the size of the group. (See Appendix 10 for questionnaire.) Data was tabulated and frequencies were calculated.

A. PROMOTION

1. ORIGIN OF THE PROJECT
   a) In all cases, the water projects were initiated by the community due to need (68.75%), inadequate systems (18.75%) or because the positive effects of potable water systems were witnessed in another community (12.5 %).
   b) Except for 3 previous systems, all systems were constructed between 1982 and 1984.
   c) The community solicited help from the Departmental Development Corporations, from CARE Promoters in the area, or in one case from Plan de Padrinos. In all cases, CARE promoters visited the community and explained to the community what the project would entail.

   COMMENTS:
   Since all the communities questioned (100%) took the initiative in mobilizing their communities and in seeking outside assistance, it may be said that this program is based on a strong felt need. The collaboration of CARE, the counterparts and other PVO's in promotion activities indicates that CARE is effectively using other human resources to attain the Project's objectives.

2. SOURCE OF WATER
   a) Before the Project, water came from a variety of sources, often different sources within the same community. These sources included wells (25%), springs (20%), rivers (40%), and watersheds (15%).
   b) The water was collected by members of the entire family (37.5%) or more commonly by women and their children (62.5%).

   COMMENTS:
   Energy previously expended primarily by women and children in the collection of water, often times from unprotected and/or polluted sources, will be available for other activities.

3. FUNCTIONING OF THE SYSTEM
   a) Each community contributed towards the building of the system. Labor and local materials (sand, stones) were contributed by 62.5% of the communities; 25% of the communities gave labor and materials and some money; and 12.5% of the communities contributed labor only. In each case, other resources were contributed by CARE.

b) In most cases (68.75%) a potable water committee/cooperative was formed to supervise the operation of the system. However, in the Department of Potosí and in one community of Chuquisaca, community members were selected to be in charge.

c) A system of maintenance was established in each community. Generally, if a water committee was established, it was the responsibility of the committee to maintain the system. In some of the committees a member was appointed as supervisor, while in others, everyone took turns. In other cases, a community member or members were appointed to be in charge. In two cases, a fee was mentioned.

d) In 87.5% of the communities one or two members had received training via the CARE-FOMO 3 week maintenance training course. It should be noted that the remaining 12.5% of the communities will send representatives to future CARE-FOMO training courses.

e) Water is abundant year round in 56.25% of the communities. Some rationing is required in 47.75% of the communities, often times during the dry season.

COMMENTS:
Community project participation and inputs were very high. The formation of committees and maintenance teams is emphasized by CARE and since the majority of the systems built are gravity systems, there is a great deal of social pressure to maintain the system - because the ruptured tubing of a neighbor often affects the pressure of neighbors.

Because maintenance is so important for the long term viability of a water system, this area should be studied in more depth. Case studies of maintenance efforts should be evaluated and the following questions should be considered: 1) What types of maintenance systems work better than others?; 2) Did the members that received technical training from CARE continue maintaining the system? Did they, in turn, train anyone else?; 3) Were there tools, pipe and other materials available in the community for maintenance purposes?; 4) Did the water committees and maintenance systems continue functioning after the project? one year after? two years after?

Conclusions concerning rationing must be reserved until more information can be gathered. Studies should be made of the quantity of water available per person and information should be gathered explaining the different reasons for the shortages.

4. RESOURCES FOR THE SYSTEM

a-d) Some type of fee, generally a monthly fee, is collected in most of the communities (86.66%) for basic maintenance, and in 30.76% of the communities, this fee will also be used for expansion of the current system. One community did not respond.

COMMENTS:
The amount of funds collected for maintenance varies in accordance with the economic means of the community. This issue of maintenance funds needs to be investigated further, taking into account Bolivia's high inflation rate. Should communities be encouraged to buy tools and materials for emergency uses, donate part of their harvest as payment, or wait until an emergency occurs? Who should manage the funds?

5. WOMEN'S PARTICIPATION

a) In most communities (81.25%) the women initiated the idea for potable water and pressured the men into constructing the system in order to save themselves the time and labor of carrying the water a great distance.

b) In one community, a woman was named as vice president of the water committee. In other communities (87.5%), women supplied labor and transportation of materials to the project site as well as cooking mid day meals for the workers. In 12.5% of the communities, the women cooked and brought meals to the project sites.

c) In all communities, the women were the principle users of water, primarily for washing and cooking.

COMMENTS:

Women were almost unanimously named as the principal users of water. In summary, women played an instrumental part in all phases of this project and will play the key role in utilizing potable water to improve the health of their families.

6. COMMUNITY ORGANIZATION

Various responses were given to this question. Answers ranged from Mother's Clubs, Neighborhood Groups, Sub-Central Syndicates, Water Committees, Women's Artesanry Clubs, Sport Clubs, Sub-Central Agricultural Guilds, Pre-Agriculture Coop, Father's Clubs, Water Associations and Water Cooperatives.

COMMENTS:

An analysis of the strength and motivation of existing organizations in participating communities should be made by promoters in order to mobilize the most appropriate ones to assist in promotion, implementation and education activities.

B. TECHNICAL ASPECTS

1. FUNCTIONING OF THE SYSTEM

a) Water is available throughout the year in 56.25% of the communities, although one community reported it was available only in the a.m. hours. In 31.25% of the communities water is available most of the year with the exception of certain seasonal periods. In 12.5% of the communities water was rationed year round due to the minimal quantity of available water.

b) Water was reported to be clean in all communities, although one community had a problem with turbidity after it rained.

c) Water is sufficient in all but three communities (81.25%), although, it needs to be rationed at times.

d) The system is assured of functioning properly through constant supervision and cleaning.

COMMENTS:

The possible health hazards of systems that do not function on a year round - daily basis are obvious. Water is often stored in non-hygienic containers, rationed to adults first and children last, and often times limited to drinking purposes only, thus, prohibiting hygienic food preparation. We believe this component of the program should be upgraded.

The quantity of potable water available to beneficiaries was not measured in this study. This is a crucial fact in accessing the possible positive impact in the benefiting communities. The percentage of how many residents in town have connections in relation to the total town population should also be studied.

While 43.75% of the communities benefited reported that water is not available all year and 12.5% reported that water must be rationed all year, 81.25% of the communities said that the water is sufficient. This contradiction in may be attributed to the relative nature of the problem - people who were critically short of water may now have enough to get by on, but is is questionable as to whether or not they are receiving sufficient to be healthy. This issue should be studied more in depth.

2. WATER USAGE
   a) In all communities the water is used for drinking, cooking, washing and bathing, although in 31.25% of the communities, it is also used for animals.
   b) Water is used on small gardens in 68.75% of the communities.
   c) All of the communities in Chuquisaca use the water when they make chicha and 18.75% of the total communities interviewed use water to make above bricks.

COMMENTS:
While it is encouraging that in many communities the water system serves multi-purpose uses, an on-going educational program would help to assure that it is being used in the most appropriate manner.

3. SANITARY ASPECTS
   a) In all communities a faucet is used to collect the water.
   b) All of the communities throw the residual water onto the street or patio with only 2 of the communities (12.5%) using the residual water on soil and plants.
   c) In 68.75% of the communities, latrines had been installed. Of this 68.75%, almost all houses had latrines in 18%, some houses had latrines in 73%, and there was one community latrine in 9% of the communities. There were no latrines in 31.25% of the communities interviewed.
   d) Less stomach problems and diarrhea was reported in all but 12.5% of the communities. These 2 communities had not noticed any change.

COMMENTS:
Faucet - patio - house connections are used in all systems and almost all residual water is thrown in the street. Besides being wasteful of a scarce resource that could be used on secondary activities such as gardening, this could present a health hazard in some of the more densely populated communities. Residual water use should be further studied and an educational program should be considered. An environmental health survey should be conducted in the communities to ascertain if the community members understand the connection between potable water and sanitary feces disposal. An educational program could be formulated with this information.

Less stomach problems were reported in all but 12.5% of the surveyed communities. Unfortunately, due to the lack of records and functioning rural health centers, the community dialogue method may be the only consistent manner in which such information can be gathered. Incidence of diarrheal disease measured will have to be studied (if so desired) by comparing neighboring communities without potable water systems. This method must be used because no community health data was gathered at the beginning of the study. A comparative study will provide sufficient data to make logical correlations concerning program impact.

4. BENEFITS OF THE SYSTEM:
TO THE FAMILY:

a) All communities are using more water now that they have the system.
b) All communities find it easier to use a faucet than to carry water into their homes.
c) 31.25% of the communities have small gardens now that water is available.
d) All communities would extend their cultivation or have gardens if more water was available.
e) All communities are satisfied that the water is good and clean.

TO THE COMMUNITY:
a) 50% of the communities reported an expansion of the town with more houses being built.
b) Other benefits reported by the communities include better health, more gardens, convenience, ease in building houses, and an increase in community spirit.
c) 31.15% of the communities responded that there was some formal health education in the school; one community attributed health education to the mother's club; and one community is boiling their water on advice from the CARE promoter. 56.25% of the communities either did not respond or said there wasn't any formal education system in their community.

COMMENTS:
The benefits listed indicate a high degree of beneficiary satisfaction, a positive community impact, and indicate areas of interest (such as gardens etc.) in which CARE or other PVO's can continue to assist participating communities.

5. OTHER PROJECTS
a) 68.75% of the communities would like an irrigation project. Reasons for not wanting this type of project include; no available water source and an inadequate amount of land.
b) 68.75% of the communities requested assistance for crop diversification.
c) 75% of the communities requested some type of animal project. 37.5% of the communities wanted to raise cattle if they could grow forage; 18.75% wanted goats for milking; 6.25% wanted rabbits and bees; and 6.25% wanted hens for eggs. One community requested assistance for better animal sanitation practices.

d) 43.75% of the communities responded affirmatively to a seed improvement project. Seed requested included potatoes, corn, barley, quinoa and frost resistant seed for vegetables.

e) When asked about health projects, requests varied in each community. Latrines, showers, agronomists, health workers, nurses and health posts were mentioned.

f). Other project solicited by the communities include electricity, artesanry projects, vegetable growing and a mill for grain.

COMMENTS:

The agro-animal husbandry needs and other aspirations of participating communities indicate that the potable water project has served as an impetus and motivating factor for other diversified community development activities that would make worthwhile follow-on projects.

RECOMMENDATIONS

1. Results of the Community Survey indicate that a more in depth evaluation should be conducted to ascertain:

   a) The long-term effectiveness of the maintenance systems and water committees.

   b) Water availability per person and reasons for water shortages.

   c) Water usage of beneficiaries and its positive and negative health effects.

   d) Residual water use.

   e) The community understanding between potable water and sanitary feces disposal and the need for patio to kitchen sanitation.

   f) Health impact as related to incidence of diarrheal disease.

   g) The impact of the maintenance training courses conducted by FOMO.

   h) The importance of including women as a member of the water committee and her role in related health education activities.

2. Follow on projects focusing on health education and other diversified community development activities should be initiated in the benefiting communities.

IV. DEPARTMENTAL DEVELOPMENT CORPORATION (DDC) INTERVIEW RESULTS:

Technical representatives of the DDC's of CORDEPO, CORDEOR, CORDEPAZ AND CORDECH were interviewed in order to ascertain their role in the implementation of the project. Technical Assistance refers to part-time intermittent help. Financial Inputs refers to peso inputs by the DDC's, during CARE's fiscal year - July 1 - June 30. Observed Project Impact and Benefits refers to their impressions unsubstantiated by statistical evidence. Other Possible Joint Projects refers to needs observed in the benefiting communities.

A. CORDEPO

Technicians Interviewed:
Engineers Franklin Gorena and Cesar Meruvia.

Technical Assistance:
- 3 Engineers
- 2 Topographers
- 2 Drivers
- 2 Draftsman
- 1 Secretary

Materials, Equipment and Transport:
- Transport expenses of materials and equipment to sites
- Drafting materials for plans

Financial Inputs - DDC's
1984 $b. 60,000,000.

Observed Project Impact and Benefits:
- a) Social : Improved community organization due to water committees.
- b) Economic : Self help systems (funds for the repair of water systems).
- c) Health : Improved basic sanitation.
- b) Education : Training from courses and on the job construction of the system.
- e) Others : No response.

Other Possible Joint Projects:
1. Irrigation
2. Small Animal Production (chickens, rabbits, etc.)
3. Fish Ponds

Project Problems:
1. No yearly evaluation of systems completed.
2. Unspecific agreements about amount of transportation costs.
3. Lack of work on irrigation program, lack of experienced people to work in irrigation.

4. Lack of coordination with the Rural Health and Hygiene Ministry.
5. Lack of capsules to transport water samples from systems installed for periodic analysis.

B. CORDEOR

Technicians Interviewed:
Engineers Juan Lizarazu and Juan Flores.

Technical Assistance:

Project Designs	1/3 at most
Promotion	1/3 at most
Training	(F O M O)

Materials, Equipment, and Transport:
- Drafting materials for Plans.
- Hand tools and topographical tools loaned to CARE.
- Transport of Program Materials.

Financial Inputs - DDC's:
1984 $b 17,075,625.

Observed Project Impact and Benefits:

a)	Social	:	Helps stop migration to the city.
b)	Economic	:	Possible micro-irrigation (gardens, etc.)
c)	Health	:	Less gastro intestinal diseases in benefiting communities. They claim 20% less (ORURO is conducting a study on the subject.
d)	Education	:	No response.
e)	Others	:	No response.

Other Possible Joint Projects: No projects listed.

Project Problems:
1. Delivery of materials on time.
2. Strikes and road blockades.
3. Lack of project support of certain benefiting communities. (The problem of communities that don't want to contribute self help labor unless they receive food for work was mentioned).

C. CORDEPAZ

Technicians Interviewed:
Engineers Juan Carlos Gottret and Javier Moscoso.

Technical Assistance:

1 Supervisor
4 Project Design Engineers (part-time)
3 Construction supervisors
2 Topography team (part-time)
3 Social promoters
7 Brick layer/plumbers
1 Secretary
1 Warehouse man
1 Lab. technician

Materials, Equipment, and Transport:

- Various light and heavyload trucks to transport personnel and materials.
2 Cement mixers.
3 Sludge Pumps.
2 Compactors.
- Topographical materials and equipment for topography teams.
- Various hand tools for bricklayer/plumbers.
- Laboratory equipment for water testing.
- Diesel and gas fuel for vehicles and vehicle maintenance goods.

Financial Inputs - DDC's:

1984 -

Observed Project Impact and Benefits:

a) Social : Better standard of living.
b) Economic : Potential increase in worker production and agricultural production.
c) Health : Lower incidence of gastro intestinal diseases.
d) Education : Improved personal hygiene habits.
e) Other : The formation of the water committee often leads to other community projects.

Other Possible Joint Projects: No response

Project Problems: No response

D. CORDECH

Technician Interviewed: Engineer Edgar Montenegro

Technical Assistance

3 Project Engineers
1 Project Design Engineer
1 Supervising Engineer

Materials, Equipment and Transport:

- Transportation equipment to move personnel and project materials and equipment.
- Laboratory equipment.
- Design materials.
- 2 Heavyload trucks to move cement PVC, etc.
- 1 Jeep.
- 1 Well perforator (part-time).

Financial Inputs:

1984 -

Observed Project Impact and Benefits

a) Social : Improved community participation and unity.
b) Economic : No response.
c) Health : Reduction in water-borne diseases.
d) Education : Improved sanitation and hygiene habits.
e) Others : No response.

Other Possible Joint Projects:

1. Complete the sanitation component of the program, latrines, waste water systems, etc.
2. Water treatment services for larger population (up to 5,008 inhabitants).
3. Micro-irrigation.
4. Appropriate technology (related to irrigation, etc.).

Project Problems: None mentioned.

RECOMMENDATIONS:

The implementation role of the DDC's should be further evaluated in terms of their ability to solve field problems, their compliance to agreements with CARE, and their level of participation.

V. INSTITUTIONAL PERFORMANCE

A. CARE/BOLIVIA

An administrative, financial and accounting review of CARE/Bolivia was conducted by USAID in November 1984. The following conclusions and recommendations were made: 1) CARE/Bolivia is in compliance with the requirements of the CARE Headquarters Office; 2) CARE/Bolivia was not in compliance with AID/Bolivia's minimum requirements "due to the the oversimplification of reports submitted in irregular patterns containing errors and substitutions of project sites and amounts previously reported"; and 3) the project's inventory control and costing system showed major deficiencies.

USAID and CARE representatives worked together and CARE's accounting system was greatly improved. Monthly financial reports were submitted after this review using an accounting system broken down into the following sections: materials and equipment, personnel and operations, New York overhead, and an accumulative summary of expenditures. Monthly advance requests were submitted instead of a few but large requests in order to conserve the value of program monies in case of devaluations.

According to USAID, even though the accounting system has improved, the inventory control and costing system still remain weak and the inventory of materials and stock card files still contains many deficiencies.

B. USAID/BOLIVIA

Although USAID financial procedures are detailed in Handbook 13 and Handbook 13 is referenced in the CARE/USAID agreement, CARE/Bolivia never received a copy of the pertinent chapters of Handbook 13.

During the first year of the project, only two of the project sites were visited by the AID project manager. Even though the AID Project Manager responded to CARE's needs, AID project manager responsibility was transferred four times during the initial sixteen months of the project.

The engineering department of AID made no field visits to confirm the engineering integrity of the systems.

RECOMMENDATIONS:

1. CARE should have sought out Handbook 13 and worked with the USAID Controller's Office in order to establish specific reporting procedures if the initial instructions were not clear.

2. The USAID project manager(s) should involve the USAID engineering department in both the design and inspection segments of the project.

3. The project manager(s) should work more closely with the AID accountant and the CARE administrative staff in order to resolve immediately any accounting and inventory control problems.

VI. SUMMARY

The results of the evaluation show that the general progress of the Project is very positive and that the purpose of the Project is being adequately met. Although food production was not measured in this evaluation, it was found that 68.75% of the communities are using water for small gardens and that the majority of the communities are interested in beginning diversified agro-animal husbandry projects. It is recommended that follow on projects focusing on diversified community development activities should be initiated in the benefiting communities.

It is also recommended that a final evaluation be conducted in order to investigate technical and social aspects of the water systems and make recommendations to ensure the long term viability and sustainability of the water systems once the Project is completed. This evaluation should also assess technical, social, cultural and institutional factors in order to determine positive and negative health and development impacts.

APPENDICES

TECHNICAL CHARACTERISTICS AND COSTS

Community	Distance	Population	Time needed to complete System	Water Source	Conduction Length	Tank Size	Number of Taps	Volume of Flow	COSTS CARE	COSTS Corporation	COSTS Commun
[illegible] Pampa (Potosí)	77	425	1 month	Spring	2000 Pipe Ø 1 1/2	20 m^3	85	80	4,716	-.-	1,029
Tocoya	57	504	3 months	Spring	Pipe Ø 1 " 1850	20 m^3	108	80	3,956	701	861
Pamoro	42	500	2 months	Spring	Pipe Ø 1 " 1200	20 m^3	62	80	4,142	714	574
Pico Grande	43	300	2 months	Spring	Pipe Ø 1 " 1200	20 m^3	44	60	2,764	340	577
Simayo	20	310	4 months	River	Pipe Ø 2 1/2 648	20 m^3	52	100	3,405	1,400	1,324
Irlo Achachila	42	432	3 months	River	Pipe Ø 2 1/2 & 2" 933/1179	20 m^3	50	100	5,943	1,000	1,251
San Antonio	55	125	3 months	River	---	---	Irrigation		1,494	251	590
Tinteros	18	246	4 months	Spring	N/A	20 m^3	36	100	2,176	1,400	1,231
San José de Milles	55	205	3 months	River	Pipe Ø 2 1/2 1045	20 m^3	63	100	2,398	504	1,240
[illegible]	145	340	3 months	Spring	Pipe Ø 2 " 1600	11 m^3	84	60	4,610	1,105	1,290
[illegible]	162	450	3 months	Spring	Pipe Ø 2 " 1285	13 m^3	160	60	5,479	877	1,422
Vichaj Lupe	155	430	3 months	Spring	Pipe Ø 2 " 4045	12 m^3	105	60	8,813	614	1,762

TECHNICAL CHARACTERISTICS AND COSTS (cont'd)

Community	Distance	Population	Time needed to complete system	Water Source	Conduction Length	Tank Size	Number of Taps	Volume of Flow	CARE	Corporation	Comm
Sivicani	70	215	3 months	Spring	Pipe Ø 2 " 310	6 m^3	26	60	8,825	-.-	3,80
Catavi	160	436	2 months	Spring	Pipe Ø 2 " 216	7.5 m^3	50	80	3,685	1,300	950
Helen	140	475	3 months	Spring	Pipe Ø 2 " 1000	6 m^3	65	80	7,400	-.-	2,990
Ikuaraca	140	320	5 months	River	Pipe Ø 2 " 4526	5 m^3	--	80	4,860	-.-	920
Altinama	140	300	5 months	River	Pipe Ø 2 " 4526	5 m^3	--	80	4,500	-.-	840

Appendix 2

COMMUNITY ACCESS

Distance from the Departmental Capital City

Minimum Distance	:	18	Kilometers
Maximum Distance	:	162	Kilometers
Average Distance	:	89	Kilometers/System

Frequency

0	-	20	Kms	:	2	Communities
21	-	40	Kms	:	0	Communities
41	-	60	Kms	:	6	Communities
61	-	80	Kms	:	2	Communities
81	-	100	Kms	:	0	Communities
101	-	120	Kms	:	0	Communities
121	-	140	Kms	:	3	Communities
141	-	160	Kms	:	3	Communities
161	-	180	Kms	:	1	Community

Appendix 3

BENEFITING POPULATION

Population Serviced

T O T A L : 6,063 Inhabitants

Average Number Serviced	=	357 inhabitants/system
Minimum Population Serviced	=	205 / potable water system 125 / micro-irrigation system
Maximum Population Serviced	=	504 inhabitants

Frequency

Potable Water System

201	-	205	:	3	Communities
251	-	300	:	2	Communities
301	-	350	:	3	Communities
351	-	400	:	0	Communities
401	-	450	:	4	Communities
451	-	500	:	3	Communities
501	-	550	:	1	Community

Micro-Irrigation System

125 Inhabitants

Appendix 4

IMPLEMENTATION DURATION

Time Needed to Complete

Minimum	:	1	month
Maximum	:	5	months
Average	:	3	months/system

Frequency

1	month	:	1	Community
2	months	:	3	Communities
3	months	:	9	Communities
4	months	:	2	Communities
5	months	:	2	Communities

Appendix 5

WATER STORAGE TANKS

Tanks

Minimum Capacity Constructed	:	5 m^3
Maximum Capacity Constructed	:	20 m^3

5 m^3	=	2	Tanks
6 m^3	=	2	Tanks
7.5 m^3	=	1	Tank
11 m^3	=	1	Tank
12 m^3	=	1	Tank
13 m^3	=	1	Tank
20 m^3	=	8	Tanks

Appendix 6

NETWORKS DISTRIBUTION

Network

Minimum	:	26	Water Taps
Maximum	:	160	Water Taps
Average	:	73	Taps per Community

21 - 40	:	2	Communities
41 - 60	:	4	Communities
61 - 80	:	3	Communities
81 - 100	:	2	Communities
101 - 120	:	2	Communities
121 - 140	:	0	Communities
141 - 160	:	1	Community
		14	Communities

Appendix 7

WATER SUPPLY

Water Supply Flow

Minimun Access to Water Source Flow	:	60	liters per person per day
Maximum Access to Water Source Flow	:	100	liters per person per day

- Average = 77.50 liters per person per day

Frequency

60 liters per person per day	:	6	Communities
70 liters per person per day	:	0	Communities
80 liters per person per day	:	6	Communities
90 liters per person per day	:	0	Communities
100 liters per person per day	:	4	Communities

Appendix 8

COST

*Cost (Material, Equipment and Money)

17 SYSTEMS	CARE	Investment	US$	79,166
	CORPORATIONS	Investment		10,206
	COMMUNITIES	Investment		22,681
		TOTAL	US$	112,053

Average Cost per System

CARE	4,657
CORPORATIONS	600
COMMUNITIES	1,334

Frequency

Number of Systems versus Cost

US$	2,001	-	3,000	-	1	Community
	3,001	-	4,000	-	1	Community
	4,001	-	5,000	-	2	Communities
	5,001	-	6,000	-	6	Communities
	6,001	-	7,000	-	1	Community
	7,001	-	8,000	-	2	Communities
	8,001	-	9,000	-	1	Community
	9,001	-	10,000	-	0	Communities
	10,001	-	11,000	-	1	Community
	11,001	-	12,000	-	1	Community
	12,001	-	13,000	-	1	Community

Appendix 9

W A T E R Q U A L I T Y

Community	Bacterial Analysis.* A	B	Physical and Chemical Analysis PH	Turbidity	Color	Smell	Taste	Salt	Alkalinity	Acid	Hardness	Ca^{++}	Mg^{++}	Fe^{++}	Mn^{++}	Cl^{-}	$SO_4^{=}$	$PO_4^{=}$	$NO_2^{=}$	$NO_3^{=}$
Belen Pampa	-	-	7.9	0.0	0.0	"A"	some	20	50.0	-	25	-	-	0.01	0.0	16.0	8.8	0.15	0.0	4.8
Tecoya	-	-	7.0	0.0	0.0	some	"	10	30.0	-	8	-	-	0.02	0.01	19.9	6.3	0.1	0.05	0.49
Pampoyo	-	-	8.6	12.0	15.0	"	none	5.0	70.0	-	80.1	-	-	0.01	0.01	20.0	25.2	0.53	0.01	0.31
Paco Grande	-	-	8.0	0.0	0.0	none	none	0.0	90.0	-	20.0	-	-	0.04	0.01	16.0	13.8	0.53	0.01	0.40
Siguayo	+	+	Only Qualified Analysis																	
Tambo Acxachila	+	+	Only Qualified Analysis																	
San Antonio	-	-	Micro-Irrigation - - - - - - - - - - - - - -																	
Tinteros	+	+	Only Qualified Analysis																	
San José Molles	+	+	Only Qualified Analysis																	
Copacabana	-	-																		
Avaroa	-	-																		
Vichaj Lupe	-	-																		
Sivicani	-	-	7.2	-	-	-	-	116	99.33	5.80	47.05	13.56	3.08	0.30	-	2.99	7.19	-	-	-
Catavi	-	-	7.3	-	-	-	-	110	41.02	3.87	23.78	5.65	2.05	0.70	-	5.99	12.34	-	-	-
Belen	-	-	6.9	-	-	-	-	504	366.00	15.48	83.8	18.08	9.26	0.32	-	26.97	52.65	-	-	-
Huaraco	-	-	7.4	-	-	-	-	128	60.12	2.90	37.70	7.34	4.45	0.60	-	8.91	20.57	-	-	-
Altiparpa	-	-	7.4	-	-	-	-	128	60.12	2.90	37.70	7.34	4.45	0.60	-	8.91	20.57	-	-	-

(*) Aerobacter & Aerogenes Atípicas

Appendix 10

COMMUNITY SURVEY QUESTIONNAIRE

EVALUACION AID - CARE

Fecha : .....

I. C O M U N I D A D ....

1. Origen del Proyecto

a) Como nació el proyecto? .....
.....
.....

b) Hace cuanto tiempo? .....
.....
.....

c) En la Comunidad? .....
.....
.....

d) Gente de afuera? - Como? .....
.....
.....

2. De donde sacaban agua antes?

a) Rio, manantial, vertiente .....
.....

b) Quién sacaba el agua? ....
....

3. Funcionamiento del Sistema

a) Construcción - Tipo y forma de contribución, como se organizaron? .....
.....
.....

b) Operación - Quién es responsable? - Hay facilidades? Supervisión, Control .....
.....
.....
.....

c) Mantenimiento - Organización - Facilidades - Responsable
.....
.....
.....

d) Capacitación - Donde Cuando, Como .....
.....
.....

e) Posible racionamiento .....
.....

4. Recursos para el Sistema

a) Para mantenimiento .....
.....
.....

b) Para reposición .....
.....
.....

c) Para ampliación .....
.....
.....

d) Cómo se obtienen los recursos - Quienes, Por qué no otros? - Que dificultades? .....
.....
.....

5. Participación de la Mujer

a) En el origen del proyecto .....
.....
.....

b) En su construcción .....
.....

c) En su uso - Como? .....
.....
.....

6. Organización Comunal

a) De que tipo? - Asociación, Cooperativa? .....
.....
.....

b) Es buena esta organización? Estás contento? Por qué?
.....
.....
.....

II. A S P E C T O S T E C N I C O S

1. Funcionamiento

a) Hay todo el año? .....
.....

b) Es limpia? .....
.....

c) Es suficiente .....
.....

d) Como se asegura el funcionamiento .....
.....

2. Uso del Agua

a) Doméstico? - Quiene usan? - Para qué? (Cocinar, lavar, higiene, animales) - Cantidad - Como reciben agua?
.....
.....

b) Riego - Terreno - Huerta - Terreno Comunal
.....
.....

c) Otros usos - Hacer chicha? - Pensión? - Restaurante?
.....
.....

3. Aspectos Sanitarios

a) Usan la pila? .....
.....

b) Disposición de aguas residuales .....
.....

c) Tiene letrina? - Pozo séptico? .....
.....

d) Se han reducido o eliminado enfermedades? .....
.....
.....

Best Available Document

4. Beneficios del Sistema

A la familia:

a) Usan mas agua que antes? - En qué? .....
.....
.....

b) Es mas fácil tener pila que traer de la fuente? .....
.....
.....

c) Se ha aumentado la extensión del cultivo? - Ha mejorado el cultivo? - Se ha mejorado el ganado? .....
.....
.....

d) Si hubiera mas agua se habilitarían mas tierras? .....
.....

e) Que opinas del agua que recibes ahora? .....
.....
.....

A la Comunidad:

a) Hay mas casas, familias? .....
.....
.....

b) Otros beneficios .....
.....
.....

c) Efecto de la educación formal en el uso del sistema
.....
.....

5. Otros Proyectos

a) Riego .....
b) Diversificación de producción .....
c) Ganadería .....
d) Mejoramiento de Semillas .....
e) Sanidad .....

III. C O N T R A P A R T E

1. Aporte o Contribución

a) Asistencia Técnica .....
.....
.....
.....

b) Materiales y Equipo .....
.....
.....
.....

c) Suministros (aceite, gasolina, etc.) .....
.....
.....

d) Servicios (transporte, almacenamiento) .....
.....
.....

c) Dinero .....
.....
.....

2. Beneficios del Sistema

a) Social .....

b) Económico .....

c) Salud .....

d) Educación .....

e) Otros .....

3. Otros Proyectos

a) Con C A R E, U S A I D
.....
.....
.....
.....
.....

AL/iiy