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**FINAL EVALUATION  
OF THE USAID/TOGO  
RURAL WATER SUPPLY  
AND SANITATION PROJECT**

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| <br><b>WATER AND SANITATION<br/>FOR HEALTH PROJECT</b>         |
| Operated by<br>CDM and Associates<br><br>Sponsored by the U.S. Agency<br>for International Development  |
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**WASH FIELD REPORT NO. 228**

**FEBRUARY 1988**

**Prepared for  
the USAID Mission to Togo  
WASH Activity No. 413**

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Prepared for the USAID Mission to Togo  
under WASH Activity No. 413

by

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Finally, we must acknowledge Fred Rosensweig, who directed the team planning meeting, and the hard work of Ata Messan Mensah in typing the draft versions of the report.

## GLOSSARY OF ACRONYMS

|           |  |
|-----------|--|
| BRGM      | Bureau de Recherches Géologiques et Minières                                 |
| cfa       | West African Franc (\$1 US = 360 cfa)  |
| CUSO      | Canadian University Service Overseas   |
| DGAS      | Département Général des Affaires Sociales (Department of Social Affairs)     |
| DHE       | Direction de l'Hydraulique et de l'Energie (Directorate of Water and Energy) |
| FAC       | Fonds d'Aide et de Coopération (France) (Fund for Aid and Cooperation)       |
| FED       | Fonds Européen de Développement (European Development Fund)                  |
| GOT       | Government of Togo   |
| O&M       | Operations and Maintenance   |
| REDSO/WCA | Regional Economic Development Services Office for West and Central Africa    |
| SGGG      | Société Général du Golfe de Guinée (general hardware and supply store)       |
| UNDP      | United Nations Development Program   |
| USAID     | United States Agency for International Development                           |
| VDC       | Village Development Committee  |
| WASH      | Water and Sanitation for Health Project                                      |
| WHO       | World Health Organization  |

## EXECUTIVE SUMMARY

The final evaluation of the Togo Rural Water Supply and Sanitation Project (USAID 693-0210) was completed in December 1987. The evaluation was undertaken by the Water and Sanitation for Health (WASH) Project with a five-person team including three specialists from concerned Togolese ministries.

In terms of accomplishments the project has been highly successful. The seven-year project provided potable water to 864 villages with a total population of about 600,000. A construction program completed 1,048 boreholes, 3 springs, 256 cisterns, and 473 latrines. Key to both the construction effort and the long-term operation and maintenance of the systems was the establishment of a Village Development Committee (VDC) in each project village.

Project coordination was difficult in the beginning because of the complex organizational structure which included four donors and three Government of Togo (GOT) ministries. Nonetheless, after a mid-term review by WASH and a renewed emphasis on social/health components within the project, considerable improvements were made in administration and management. Coordination between the drilling components and the village development components, in particular, was synchronized to the project's benefit.

Training of GOT field agents and of members of VDCs was an integral component of the project, and effective participatory training methodologies were used. During the life of the project, 120 field agents each received about 160 days of training, an amount which was well justified.

The VDCs were formed to assist in planning and implementing project activities. Committees consisted of 7 to 13 members including a president, secretary, treasurer, pump repairman, woman pump caretaker, woman ORT demonstrator, and committee advisors. Each of these individuals received specialized training in their fields. The strategy which was used to involve the community included meetings in the villages; training workshops for villagers from a group of adjacent villages; and follow-up and evaluation of the community activities. This process of community organizing and training required careful follow-up by the field agents for several years. It is believed that the careful organization, training, and follow-up of community members is necessary in a rural water supply project if one seeks to assure the coherent and sustained participation of communities. The community organizing and training strategy used in the project was very well planned in advance and in the majority of cases, where the field agents were motivated and persistent, was very effective.

The contracting for drilling boreholes with a private sector firm was effective and efficient. Costs were cut by one-third by this means. Siting of boreholes was also effectively accomplished through contracting with a French geologic firm, Bureau de Recherches Géologique et Minières (BRGM), and the Directorate of Water and Energy (Direction de l'Hydraulique et de l'Energie).

Significant problems were encountered in equipping boreholes with pumps. Procurement delays have led to 340 boreholes being without pumps for more than two years. In addition, a new pump, UPM model, has been selected in lieu of the Vergnet pumps which were employed on other project boreholes. It is recommended that all available resources be utilized in equipping remaining boreholes and that training be given to repairmen as soon as possible.

Pump maintenance has been generally effective but improvements are still needed. The cost and availability of certain Vergnet pump parts have not been satisfactory. Regional repair teams have been overworked and have not been able to respond quickly enough to meet village needs. The extension of a three-tier maintenance system to the project zone is recommended in the future.

Springs and cisterns as alternative water supply technologies were found to be effective. Cisterns, in particular, are important alternatives in areas without groundwater resources. About one-third of the boreholes were dry. The cisterns are rather expensive, however, and more studies on less expensive models are needed.

Latrine construction was also effective but covered only a small percentage of project villages. Again, the models chosen were somewhat expensive and more studies are needed to find acceptable, less expensive designs. In future water projects more emphasis is needed on latrine construction in order to maximize health benefits.

Increased emphasis in the future is needed on protecting the water quality of boreholes. An estimated 15 to 20 percent of boreholes have bacteriological contamination that pose health hazards. These boreholes can be protected from contamination in most cases by improving the drainage around the borehole and by chemically treating the borehole after pump installation and repair.

The project has been a model of effectiveness in establishing Village Development Committees. These committees have been and will continue to serve as important vehicles for rural development. It is important that the GOT continue to support the VDCs through the work of field agents. The forthcoming USAID project on Child Survival should utilize to its advantage the established VDCs and the approaches in training and community development formulated by this project.

## Chapter 1

### INTRODUCTION

This report constitutes the final evaluation of the Togo Rural Water Supply and Sanitation Project (USAID/TOGO No. 693-0210). The evaluation took place in Togo for a period of four weeks between November 16 and December 11, 1987. The evaluation team was composed of both expatriates and Togolese specialists in several disciplines. The members of the evaluation team were as follows:

|                             |   |
|-----------------------------|---|
| Philip Roark                | Team Leader, Management and<br>Administration<br>WASH Project   |
| Judi Aubel                  | Training and Health Education<br>WASH Project   |
| Kossi Hodin                 | Water Resources<br>Water and Energy Directorate,<br>Ministry of Civil Works, Mines,<br>Postal Services, and<br>Telecommunications<br>Government of Togo |
| Okalie Kankarti (Sant'Anna) | Community Development<br>Directorate for Women,<br>Ministry of Public Health,<br>Social Affairs, and Women's<br>Welfare<br>Government of Togo           |
| Ayc Marfa                   | Sanitation and Health<br>National Sanitation Service,<br>Ministry of Public Health,<br>Social Affairs, and Women's<br>Welfare<br>Government of Togo     |

#### 1.1 Objectives of Final Evaluation

The objectives of the final evaluation are to provide a general overview of project activities and results since the mid-term evaluation in 1983, to review project responses to recommendations, and to attempt to determine the project's long-term impact. The focus will be on those objectives identified by project authorities which are believed to encompass the key issues and lessons learned from this project. It is expected that many lessons learned from this project will be useful to the proposed Health Sector Support for Child Survival Project as well as other water projects in Togo and elsewhere.

Several subjects of interest have been identified containing key issues within the project. The following aspects of the project were examined and the report organized accordingly.

- Administration and Management
- Training and Health Human Resource Development
- Community Development
- Construction
- Maintenance
- Water Quality.

The evaluation model utilized in this report considers not only the inputs and outputs but places particular emphasis on the efficiency of project undertakings and their impact on the beneficiaries. Each of these aspects have been assessed according to

- Resources
- Organization and institutional framework
- Results
- Efficiency of project activities
- Impact on beneficiaries, particularly on health, economy, environment, and women.

## 1.2 Methodology

The evaluation was based on a review of project documents, meetings with project authorities, and visits to 16 project sample villages.

A questionnaire developed by team members was applied to each of the villages which were chosen randomly for geographic diversity as well as for representative numbers of latrines, cisterns, and springs (see Appendix C for a list of villages visited).

The sample of 16 villages out a total of of 864 project villages is not statistically representative but, none the less, the results obtained appear consistent with other reports and projects. Ideally, an evaluation should be based on a comparison of pre-project indicators determined in a baseline survey with end-of-project results. This project, like many other development projects, did not have an adequate baseline survey and, therefore, the evaluation team has relied largely upon its collective experience in judging project results. Some interesting comparisons have been made with a USAID project in Burkina Faso which was implemented over the same time frame and under similar environmental and social economic conditions.

### 1.3 Project Background

The Togo Rural Water Supply and Sanitation Project was a joint undertaking by four international donors (USAID, French Fund for Aid and Cooperation, the European Development Fund, and the Peace Corps) and the Government of Togo. The project began in 1980 with the objective of providing safe drinking water to rural villages in the Plateau and Savanna Regions of Togo.

Initially plans were to provide 400 drilled wells equipped with handpumps to 128,000 inhabitants in 350 villages. The drilling component achieved its goals faster than expected; 400 wells were completed in 1983, one year sooner than planned.

In 1984 an educational component was developed which emphasized health education, the proper utilization of water, and the role of latrines in preventing disease.

Because of the speed with which project goals were reached, the mid-term evaluation recommended an extension of the project and funding was made available to construct 1,000 wells. The project completion date changed to December 1987.

The education component became a key feature of the project. It emphasizes the training of Ministry of Public Health and Social Affairs extension agents, the education of village populations in health and sanitation, and the organization of Village Development Committees (VDCs). Related activities include the training of local pump mechanics, women pump caretakers, oral rehydration therapy (ORT) volunteers, and the VDCs themselves. An alternative water sources program was begun (i.e., the construction of water systems and spring-capping for villages where drilling produced no water), as well as latrine construction, an oral rehydration therapy campaign, and a campaign to eradicate guinea worm disease.

The Water and Sanitation for Health (WASH) Project has followed the implementation of this project from its beginning. Its interventions have included several consultancies and participation in the mid-term evaluation of 1983. That evaluation noted the effectiveness of both the well drilling and the health and sanitation education components of the project. Its major recommendations were to extend the life of the project, increase the budget, and improve management and administrative aspects of the project. Another important recommendation was to develop a component for the provision of alternate water sources. It also mentioned the deficiencies in the pump maintenance program. Several internal evaluations were subsequently undertaken during the remainder of the project, in part to gauge the degree to which interventions recommended by the mid-term evaluation were carried out and their success.

#### 1.4 Project Goals and Objectives

During the seven years of project activities several changes, in the form of contract amendments, were made in project objectives and outputs. The principal goals of the project were to improve the health of rural inhabitants through the prevention of water- and sanitation-related diseases including guinea worm, intestinal parasites, diarrhea, and other infections; reducing infant mortality from diarrhea and dehydration; improving the nutritional status of children under five years of age; and extending the responsibility and self-sufficiency of villagers in pump maintenance, sanitation, and community development. The principal objectives were the construction of 1,000 drilled wells with pumps, 612 latrines, 126 cisterns, and 10 capped springs; providing training for Village Development Committees, field agents in social affairs and sanitation, and pump repairmen and other village specialties; establishing a Village Development Committee in 350 villages; and reinforcing basic health techniques for 245,000 rural inhabitants.

## Chapter 2

### ADMINISTRATION AND MANAGEMENT

Project resources came in several forms from varied sources. The inputs are divided into financial, personnel, and material resources, and the sources include the international donors, the GOT, and the villagers who participated in the project.

#### 2.1 Financial Resources

Project funding and personnel were provided by the Government of Togo, USAID, FED, FAC, and the Peace Corps.

The financial contribution of each donor is indicated in Table 1 below.

Table 1  
Financial Contributions by Source

|               | \$US<br>(thousands) | CFA<br>(millions)* | %        |
|---------------|---------------------|--------------------|----------|
| USAID         | 10,889              | 3,920              | 65       |
| GOT**         | 3,117               | 1,122              | 19       |
| FAC           | 1,458               | 525                | 9        |
| FED           | 538                 | 193                | 3        |
| Peace Corps** | <u>750</u>          | <u>270</u>         | <u>4</u> |
| TOTAL         | 16,752              | 6,030              | 100      |

\* The exchange rate used throughout this report is 360 cfa/US \$1. This was the average exchange rate during the seven-year life of the project.

\*\* The values indicated for the GOT and Peace Corps are estimated, as actual expenditures were not available.

The Peace Corps contributed volunteers who served in the districts as technical assistants. The Peace Corps provided 30 person-years of effort valued at \$25,000/year.

The FED funded the equipping of regional repair crews and operational costs of the crews.

The FAC funds were used to purchase pumps (Vergnet and UPM models). It should be noted that FAC funds (cfa 75 million) were also utilized for field research on the UPM pump (which will be used in equipping the remaining project wells) but this amount was not included in funding totals.

The GOT contributions were primarily the salaries of Togolese assigned to the project and diverse expenditures for project offices. USAID provided funds for drilling operations and hydrological investigations which comprised the largest expenditure (about 74 percent) within the USAID budget. In addition, USAID funds were used for community development, construction of other facilities (latrines, cisterns, and springs), and project administration. Line items within these project components include local hire salaries, vehicles and fuel, salaries of technical assistants, and miscellaneous equipment and materials. A summary of USAID expenditures is provided in Table 2.

In addition to funds provided by the GOT and the donors, the villages themselves contributed significant sums. Cash contributions and estimates of labor and materials total \$440,000 (cfa 198 million).

It is interesting to note that the total project funds of \$16,752,000 translates into about \$19,000 (cfa 7 million) per village (864 villages) or \$24 (cfa 9,000) per person (800 persons/village).

## 2.2 Personnel

Personnel assigned to the project by the GOT totaled 212. This included administrative personnel such as the national and regional coordinators, accountants, and secretaries. The majority were field agents who worked in community development and health education. In addition, some personnel were hired under contract for construction activities such as carpenters, masons, and support personnel such as mechanics and drivers.

A list of project personnel is provided in Table 3. Of those 11 percent are women (19 agents, 3 secretaries, and 1 mason). Not included on the list are expatriate technical advisors employed by USAID or the Peace Corps nor technical assistance provided under the drilling contract in hydrogeology and drill-rig operation.

## 2.3 Contract for Well Construction

Sites for well construction were selected through a contract between USAID and BRGM (Bureau de Recherches Géologiques et Minières). Well drilling was completed under contract with the firm GRIFFIN-INTRAFOR. The total cost for hydrogeologic studies, well drilling, casing, and pump testing was \$8,818,000 (cfa 3,130 million) or about \$8,300 (cfa 3 million) per well (1,048 production wells).

Vergnet foot pedal pumps were furnished by FAC at a cost of about \$989 (cfa 356,000) per pump. There are, at the time of this report, 340 wells which are not equipped with a pump but which are to be furnished with a UPM pump at somewhat reduced cost of \$947 (cfa 341,000) per pump. The total project costs for pumps were \$1,022,000 (cfa 363 million).

Table 2

USAID Expenses for the Togo Rural Water Project  
Socio-Sanitation Development Program No. 693-0210

(in U.S. dollars)

| <u>Expense Column</u>  | <u>Wells</u>  | <u>Community Develop.<br/>&amp; Sanitation Ed.</u> | <u>Construction</u> | <u>Supervision/Admin</u> | <u>Total</u>   | <u>Percentage<br/>of Total</u> |
|------------------------|---------------|--|---------------------|--------------------------|----------------|--------------------------------|
| Local salaries         | \$ 1,000      | \$ 35,000  | \$ 282,000          | \$ 14,000                | \$ 332,000     | 3.1%                           |
| Materiel/Materials     | 0             | 0  | 203,000             | 0                        | 203,000        | 1.9%                           |
| Equipment              | 8,000         | 167,000  | 131,000             | 44,000                   | 350,000        | 3.2%                           |
| Operations             | 7,000         | 206,000  | 265,000             | 74,000                   | 550,000        | 5.1%                           |
| Tech. Assistance       | 0             | 422,000  | 290,000             | 238,000                  | 949,000        | 8.7%                           |
| Well Contract          | 8,007,000     | 0  | 0                   | 0                        | 8,007,000      | 73.8%                          |
| Training               | <u>21,000</u> | <u>178,000</u>                                     | <u>108,000</u>      | <u>151,000</u>           | <u>458,000</u> | <u>4.2%</u>                    |
| Total                  | \$8,044,000   | \$1,008,000  | \$1,279,000         | \$521,000                | \$10,849,000   | 100.0%                         |
| Percentage of<br>Total | 74.1%         | 9.3%   | 11.8%               | 4.8%                     | 100%           |                                |

1. Salaries = those paid by USAID funds and not by the government's B.I.
2. Materiel/materials = for construction
3. Equipment = vehicles, repair tools, office equipment, etc.
4. Operations = fuel, vehicle repair, office rent, etc.
5. Well drilling contract = geologic research and drilling contracts
6. Training = interior and exterior

Table 3  
Personnel

| Category                                  | Number |
|---|--------|
| A. Administration                         |        |
| <u>National Level</u>                     |        |
| Coordinator                               | 1      |
| Accountants                               | 2      |
| Secretaries                               | 4      |
| <u>Regional Level</u>                     |        |
| Coordinators and Supervisors              | 6      |
| Accountants                               | 4      |
| Secretaries                               | 2      |
| B. Community Development/Health Education |        |
| Social Affairs Agents                     | 74     |
| Health                                    | 38     |
| Water                                     | 6      |
| C. Constructions (latrines, etc.)         |        |
| Carpenters                                | 10     |
| Masons                                    | 40     |
| Iron Workers                              | 4      |
| D. Garage                                 |        |
| Mechanics                                 | 4      |
| E. Other (drivers, watchmen)              | 17     |
| TOTAL                                     | 212    |

Apron construction was financed by FAC through Water Services (Service Hydraulique). Village contributions in the form of labor, materials, and money were also significant. Total apron costs were \$378 (cfa 136,000) per apron, with the costs divided between Water Services \$278 (cfa 100,000) and village contributions of \$100 (cfa 36,000).

The total average cost of a fully equipped well was \$9,700 (cfa 3,495,000).

#### 2.4 Equipment and Materials

Equipment and material costs were a significant part of USAID project contributions. A fleet of 15 vehicles was procured including trucks, pick-ups, and passenger vehicles. The vehicle costs were \$240,000 (cfa 86.4 million). In addition 218 motor bikes, primarily for field agents, were purchased at a cost of \$193,000 (cfa 69.5 million). The costs amounted to about 4 percent of USAID costs with an additional 3.2 percent (\$364,000 or cfa 131 million) required for fuel.

#### 2.5 Functional Distribution of Costs

The original project focus had three components which were to be developed in tandem including well construction, latrine construction, and health education/community development. As the project developed, however, more emphasis was placed on health education/community development and less on latrine construction. Well construction was expanded to include other water technologies of spring-capping and roof-top cistern construction. Other categories of project activities include administration and supervision and operations and maintenance.

Table 2 provides a breakdown of USAID expenditures into their functional categories. Well construction absorbed 74 percent of the costs, and community development/health education amounted to about 9 percent of total USAID finances. When the contributions of the other donors are considered (see Table 4), the relative distribution changes--primarily because of the large GOT contribution of salaries for field agents and other government employees. While it was necessary to estimate the distribution of some costs, it appears that the functional breakdown of the total project expenditures of \$16.7 million (cfa 6,000 million) was as follows:

Table 4

#### Functional Distribution of Total Project Costs

|   |     |
|---|-----|
| Well construction                         | 57% |
| Community Development/Health Education    | 25% |
| Alternative Technologies (latrines, etc.) | 11% |
| Administration                            | 4%  |
| Operations and Maintenance                | 3%  |

It should be noted that while the community development/health education percentages are higher than other projects of this type, it is probably relevant in that this component was a key element in project success. The activities surrounding training, community development, and health education tend to blend together, and therefore the costs are lumped together. Further, it is apparent that latrine construction and other alternative water technologies were more demonstrative in nature and covered only a small percentage of total project villages. If latrines had been constructed in all villages their relative costs would have been much higher. Finally, operations and maintenance (O&M) expenditures represent only the FED contribution and not the village contributions, which were substantial. Also O&M costs are recurring and will extend into the future. The O&M costs must be considered as representative only as initial costs during the construction phase of the project and not as a total cost for the overall life of the wells.

## 2.6 Organizational Structure

The organizational structure of the project is shown in Figure 1 and ranges from the international to the village level. USAID and other international donors deal with three ministries and several divisions within the ministries. They are:

### Ministry of Planning

Controller of Management

Ministry of Civil Works, Mines, Postal Services and  
Telecommunications (Ministère de l'Équipement, Mines,  
Postes et Télécommunications)

Water Services (Service hydraulique)

Ministry of Public Health, Social Affairs, and Women's Welfare  
(Ministère Santé publique, Affaires sociales, et Condition  
féminine)

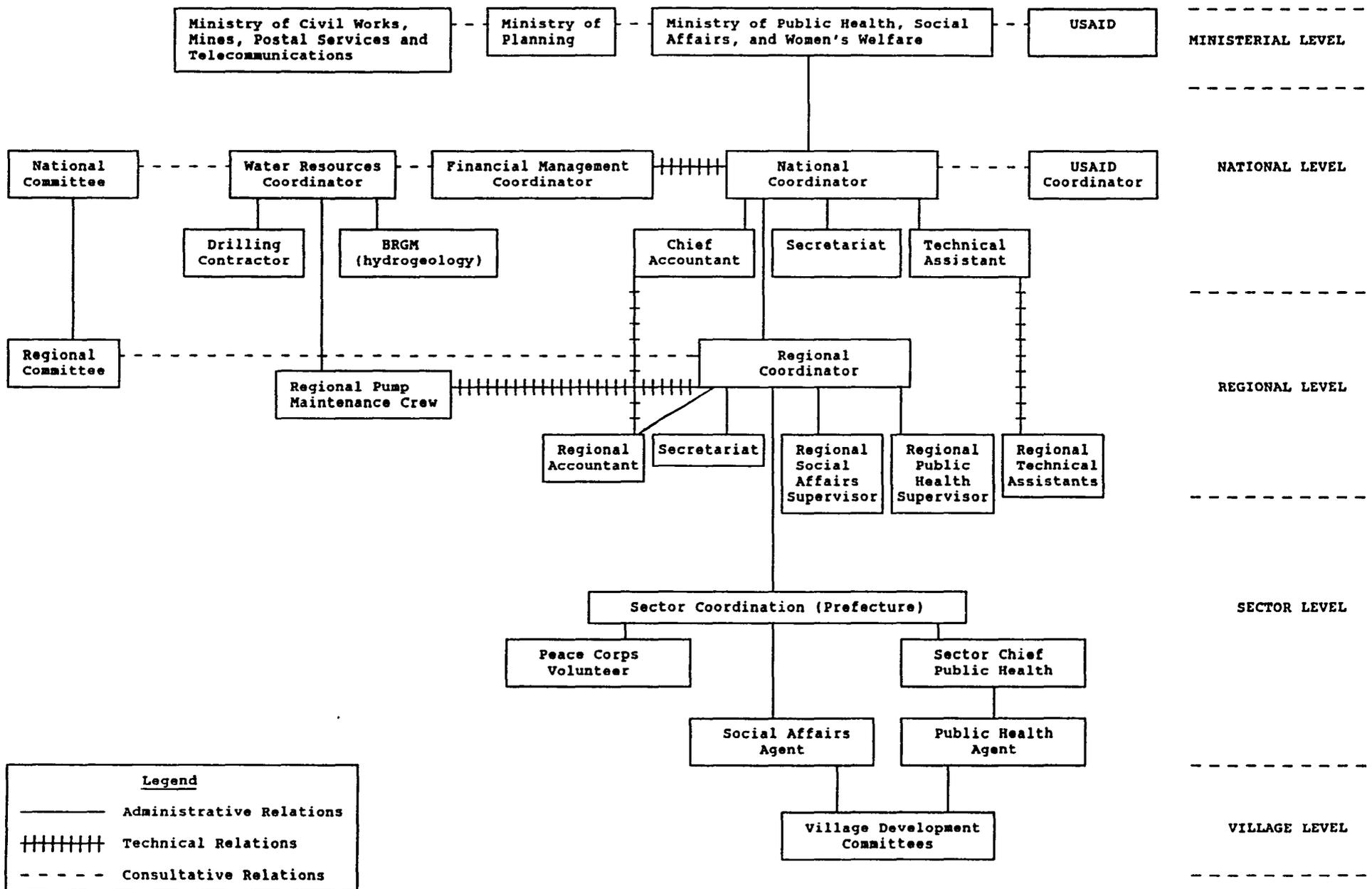
Social Affairs Services (Service des Affaires sociales)

Health Education and Sanitation (Service d'Assainissement et  
d'Éducation pour la Santé)

In order to coordinate the numerous organizations involved in the project, a national technical committee was formed consisting of the General Directors and the Service Chiefs of each of the organizations. The presidency of the committee was rotated and meetings were held when needed.

A permanent Secretariat was established to oversee day-to-day operations. The Secretariat consisted of the National Coordinator, who was appointed from the Social Affairs Ministry, and was assisted by a USAID advisor. The Secretariat also included accounting and secretarial staff.

Figure 1  
Project Organigram



At the regional level a technical committee composed of service chiefs, prefects, and their associates assures the role of advisors in each region. The Regional Director of Social Affairs served as the project Regional Coordinator and was assisted by a Regional Supervisor and a USAID advisor. They coordinated project technical activities with the regional chiefs of Sanitation and Water Services.

This structure is further divided into sectors which were headed by Social Affairs sector chiefs and assisted by Peace Corps volunteers. At the field level, about 120 agents provided contacts in village level activities. Within the villages the project established Village Development Committees (VDCs) which were the focus of most planning activities. The committees consisted of officers chosen from within the village.

The project adopted at the national level a rolling plan system which was updated every trimester. Participants in the trimester planning included the national and regional coordinating staff and their assistants. Project reporting consisted of an Annual Report and special reports after the completion of specific campaigns.

## 2.7 Accounting

For the management of USAID funds an accounting system was established which was particularly rigorous. Accounts were kept by the Chief Accountant in the Coordination Office with assistance at the regional level by two Regional Accountants. All financial transactions required the signature of the National Coordinator and the Controller of Management within the Ministry of Planning. A small petty cash revolving account of \$278 (cfa 100,000) was established at the regional level and of \$2,778 (cfa 1,000,000) at the national level. All other financial transactions followed a rigid process which required planning well in advance of actual disbursement. An inventory control system was also established for equipment and materials including consumables such as fuel.

A detailed description of the administration, management, and accounting systems established by the project can be found in the Project Final Report, Rapport Général de toute la vie du projet USAID/Togo, de 1981 à 1987 by Ouro-Bawinay Tchatomby, Project National Coordinator.

## 2.8 Management and Administration Systems

The mid-term evaluation report stated, among its conclusions, that the project was weakest in the area of administration and management. The major difficulties included insufficient financial management procedures, excessive personnel transfers, insufficient staffing in certain prefectures, infrequent reporting by GOT and US personnel, and organizational flaws at the top of the hierarchical structure. Poor communication and coordination among national and regional staff were cited. Management of the technical services of the Water Services branch was found by the mid-term evaluation team to be good.

### 2.8.1 Financial Management Procedures

In order to improve financial management it was recommended that a private accounting firm be retained to establish procedures. This was done through the Abidjan firm of Akintola Williams, Inc. in mid-1983, and the procedures established have been used throughout the project since that time.

Also in 1983, the project hired a chief accountant and two regional accountants. This, in addition to the present National Coordinator taking up his position in late 1982, has led to a vastly improved and acceptable system of financial management.

### 2.8.2 Transportation

Fuel allocations for field agents are based upon monthly request forms which the agents submit to Regional Coordinators. This system assures fuel allocation based on need. While some agents suggested that more fuel would be desirable at times, the overall system appears to be working satisfactorily and allows the agents generally to accomplish their monthly tasks.

### 2.8.3 Per Diem

A system of per diem has been established for official travel among project staff based on GOT standards. This per diem appears to meet the minimum needs of the staff and does not at present pose difficulties to project implementation.

### 2.8.4 Vehicles

Motorcycles were not available to all agents in 1983, but this was rectified and project vehicles appear generally adequate for project needs. It was the consensus among agents that the existing models of motorcycles should be replaced with more rigidly constructed and somewhat higher powered models. In consideration of the distances and road conditions that exist in the project areas, "trail bike" models are more appropriate than the present "street" models. Costs of trail bikes, however, are said to be three times the existing costs and, therefore, a thorough analysis of this proposal is needed.

It has also been suggested, and applied by other projects in Togo, that a system of transferring ownership of the motorbikes to the agents is desirable. The agents would repay, according to the suggestion, the purchase costs over time and be responsible for repairs. This proposal also needs more study but does appear to offer significant advantages.

Other vehicles utilized by the project, such as passenger cars and trucks, appear to be appropriate for Togo, although the project could have benefited from two more heavy trucks during construction activities.

### 2.8.5 Centralized Financial Management

The mid-term evaluation team recommended the creation of a regional petty cash fund. This was done in the amount of cfa 100,000 per month. These funds have been reviewed monthly by the chief accountant and have been effectively utilized.

Of concern to the present evaluation team is the sometimes long delay in processing project funds. The management system requires all financial transactions to follow the path described below:

- (1) Decision to purchase made by project personnel
- (2) Obtain invoice or cost estimate
- (3) Submit request form to General Controller
- (4) Signing of each check by National Coordinator
- (5) Submit check to General Controller
- (6) Purchase and obtain delivery receipt or attestation of payment received for per diem, etc. to General Controller
- (7) Submit receipts, statements, payment attestations, etc. to General Controller
- (8) Submit invoices for reimbursement to USAID/Lomé
- (9) Submit invoices for reimbursement to REDSO/WCA.
- (10) Reimbursement by check from USAID/Abidjan.

This process normally takes three months to complete, and longer delays have resulted in the project's resorting to borrowing money from a commercial bank to meet debts. The sheer number of bureaucratic steps is imposing but acceptable in light of the concern over past mismanagement of funds. However, the time required for each step of the process to be completed appears to be excessive.

The steps involving the General Controller have been seen by project staff as sometimes hindering work progress. The financial process has been often delayed or stopped because of absences or questions by the General Controller relating to technical criteria for project purchases and by certain incompatible administrative procedures of USAID and the GOT. Delegating authority for document signatures to an aide during absences and accepting requests made by project personnel for technical purposes would appear to be logical steps to improve the financial process.

#### 2.8.6 Reassignment of Personnel

The final evaluation team found no dissatisfaction among agents regarding transfers. According to project personnel, the number of annual transfers has changed little since the mid-term evaluation, but it has not appeared to affect progress significantly. Rather, it appears that the changes have been a normal recycling of agents by the overall GOT administration. It is advisable, however, that regional directors be asked their advice on transfers proposed by GOT personnel officers before they occur.

In a few instances it was reported that some personnel assigned to the project were not working satisfactorily but nonetheless remained at their post. For example, for two years a Regional Director had a negative effect on the project in the Savanna region. Some personnel problems are inevitable in any project, and it is advisable to correct these quickly. Overall, however, the evaluation team was impressed with the quality of project personnel.

#### 2.8.7 Vehicle Maintenance

With the creation of regional garages and a small stock of spare parts the vehicle maintenance problem appears to have improved progressively and to have operated effectively over the latter years of the project.

#### 2.8.8 Reports

The mid-term evaluation team recommended monthly reports for all regional project staff. This recommendation has not been followed--rather, reporting is done on an annual basis or at the end of particular campaigns.

The final evaluation team believes that it is unfortunate that monthly reports were not instituted for both regional staffs and field agents. In the future, they should be expected to submit monthly reports. It is recommended that reports be short, two pages at most, and that they address the elements mentioned below:

- intended accomplishments for the month
- actual accomplishments for the month
- problems encountered and solutions proposed
- intended accomplishments for next month.

This reporting form requires the agents to plan their monthly activities, to allow self-evaluation, to place problems before supervisors, and to suggest solutions which supervisors can, hopefully, act upon to facilitate reaching planned objectives. Agents already submit monthly work plans for fuel allotments, but there is no corresponding format to show actual achievements nor a format for suggestions. It would allow supervisors to be assured that the agent has understood the current project objectives and is directing his or her activities toward those objectives. The same format is recommended not only at the agent level, but throughout the project. It is basically a minimal reporting style but provides supervisors a quick and timely update on project activities.

#### 2.8.9 Interagency Coordination

The coordination of a project as complex as this one will always be problematic. While the evaluation team has learned of several instances where coordination has been less than desirable, the overall accomplishments attest to the fact that coordination was generally good. The effective combination of highly technical activities with sophisticated social interventions requires a delicate balance which has often been the demise of similar projects.

One major problem still exists within the project relating to coordination. About 340 wells still have not been equipped with a pump, some for more than two years now. As village committees were formed and have worked to achieve all other project requirements, this delay in receiving a pump has been most discouraging and may affect the future success of village activities. It is understood that the reasons for the delay in pump deliveries are not clear and are disputed among the parties involved. In the future, it is recommended that key equipment, such as pumps, be in hand or in the procurement process before the village orientation process is begun and that all efforts be made to install the remaining pumps as quickly as possible.

#### 2.8.10 Maintenance of Pumps

The mid-term evaluation recommended a fourfold increase in regional pump technicians. This recommendation was not followed, as there are only two teams in the Plateau Region and one in the Savanna. This has been detrimental to project objectives, as pump breakdowns beyond the capabilities of the village to repair have occurred more frequently than expected. Delays of several months have been reported before technicians respond to repair requests. Spare parts have also not been stocked in sufficient supply at the designated stores, resulting in further delays. (For a further discussion of maintenance problems, see Chapter 6.)

#### 2.8.11 Institutionalization

The project has, in several ways, provided an indigenous foundation for the continuation of many project activities in the future. The focus of project activities around government field agents and villages committees was an important component of the project design. The village committees, as institutions at the local level, provide the framework to continue project activities in pump operation and maintenance, ORT demonstrations, health education, and to some extent in latrine, cistern, and spring construction. In addition, in many villages the committees are poised and interested to take on new activities such as irrigation, small animal production, and school and dispensary construction. Although a few villages will take on such activities without assistance, most will need some technical and financial assistance.

The field agents, at the next level above the villagers, are established and are well trained and generally motivated to continue their past efforts. It is expected that the agents from Social Affairs and Sanitation will be given other priorities at the end of this project, but it will be necessary to

reserve at least part of their time for continuing their present work. To continue their work they will need, of course, motorbikes and fuel as well as other basic supplies. It is strongly recommended that the GOT allocate sufficient budget resources for this purpose.

Pump maintenance also depends upon an institutional framework that includes a number of entities. The Regional Mechanics, within the Direction Hydraulique, are to undertake all repairs which are beyond the capabilities of the village repairmen. The village committees are responsible for the purchase of spare parts. Spare parts are to be made available by franchised outlets (Société Générale du Golfe de Guinée or SGGG) overseen by Direction Hydraulique. This system is in place but is not functioning as well as desired. Spare parts have been more costly than anticipated and the number of regional repair teams available is insufficient.

In order to improve this situation FED had planned to help finance the rural maintenance operations and to expand them to include regional artisan repairmen. This was scheduled to begin next year, but because of GOT bureaucratic delays in authorizing the work, these plans have been dropped. This has placed the maintenance system in jeopardy. It is recommended that the GOT assure the necessary funds to at least maintain the existing maintenance system.

In summary, the institutionalization of the various elements mentioned above has been a major accomplishment of the project. These institutions are the framework within which one can expect that project activities will be sustained and hopefully enhanced in the future.

## Chapter 3

### TRAINING AND HUMAN RESOURCE DEVELOPMENT

#### 3.1 Goals and Objectives

Subsequent to the mid-term evaluation the Togo Rural Water Supply and Sanitation Project (April 1983) goals and objectives were redefined. In the original project paper the goals and objectives were formulated in terms of the impact on community health status. The mid-term evaluation recommended that the objectives of the project be reformulated to focus on behavior.

Objectives of the training and community organizing component of the project were formulated as follows:

Within the Department of Social Affairs:

- to reinforce the collaboration among the different departments responsible for rural community socioeconomic development and health
- to strengthen community development knowledge and skills of the social affairs field agents
- to strengthen several existing programs of the Department of Social Affairs including functional literacy, infant nutrition centers, and women's and community micro-economic activities

In the villages:

- to establish Village Development Committees (VDCs) which would be responsible for the analysis of local problems and for the identification of solutions to these problems
- to establish a pump maintenance system
- to encourage communities to consciously and consistently use potable water and to be wary of dirty water in order to reduce water-borne diseases
- to assist communities to recognize, analyze, and act upon their own health problems using local village resources sometimes complemented with outside resources
- to assist each village in implementing at least one project which addresses a health problem identified by the VDC using the step-by-step planning process introduced by the project

- to assist communities to use simple health interventions to prevent and treat infant diarrhea, malnutrition, and other common community health problems
- to establish effective working relationships between VDCs and the ministry departments responsible for rural development activities
- to cap springs in villages where drilling efforts have not resulted in sufficient water supply

## 3.2 Personnel

### 3.2.1 Field Agents

There are 120 field agents from the Departments of Social Affairs and Sanitation of the Ministry of Health in the Savanna and Plateau regions. Of these 19 are women. Usually the field agents work in teams of two, one from each of the two departments, thus providing the complementary capabilities of social work and technical skills.

The responsibilities of these field agents are:

- to train other field agents, members of the VDCs and village volunteers in project activities
- to supervise the VDCs and village volunteers once they are trained
- to supervise the construction of latrines, alternative water resource technologies, and other community development activities
- to participate in work sessions dealing with project planning and evaluation and educational materials development.

### 3.2.2 Technical Assistants

The project received 152 person-months of long-term technical assistance in health planning, health education, and engineering. The responsibilities of the technical assistants were:

- to train field agents, including Peace Corps volunteers
- to plan, organize, and manage project activities
- to develop training and educational materials for the field agents and for the community

- to evaluate and redesign project activities on an on-going basis and
- to follow up project field activities and support field agents in the implementation of these activities.

In addition to the long-term technical assistance in the project, there were 20 months of short-term technical assistance for specific activities.

### 3.2.3 Peace Corps Volunteers

The participation of 20 Peace Corps volunteers during the life of the project was anticipated at the outset. Ultimately, 15 volunteers worked on project-related activities. These included gardening, mechanics, community development, health education, spring capping and construction, epidemiology, and management.

### 3.3 Training and Community Development Strategies

The development of the training and community organization component was based upon several principles as follows:

1. Community participation and organization
2. Human resource and institutional development
3. Involvement of women in project activities
4. The use of an eight-step strategy in the development of all training activities
5. The use of participatory training methodologies

#### 3.3.1 Community Participation and Organization

In this project, community participation is the basis for the implementation of all other activities. Community participation is defined in the project as "a continuous learning process during which the community clarifies, acquires, and actively applies knowledge, skills, and organizational capacities necessary to the resolution of its own problems."

A project aim was to reinforce the community's capacity to solve a particular problem, that of access to clean water, and through that experience to strengthen its capacity to organize in order to solve other problems and to carry out other community development activities.

The project strategy includes meetings with the villagers; villager training workshops; follow-up after training; and evaluation in cooperation with the community of each activity. The objective is to bring about changes in the attitudes, knowledge, and practices with regard to the prevention and treatment of common diseases and water-related diseases in particular.

The project's approach to community participation is a practical, step-by-step strategy for analyzing and solving problems. This same strategy was taught and used at the different levels of the project--with the field workers as well as with the villagers themselves.

The first phase was the establishment and training of Village Development Committees. The village committee was considered the nucleus which could first mobilize the community for the installation and maintenance of the pump and later serve as a catalyst to organize the community for other local health-related development activities. While Village Development Committees existed in some villages prior to the project, it was noted that the planning and organizational capabilities of the committees were often weak and their accomplishments in terms of community activities limited. The goal of the program was, therefore, to either create or strengthen local organizations.

Once the committees were established, a number of other "community volunteers" were chosen and trained to assume responsibility for several specific tasks related to the use and maintenance of the pumps, latrines and cisterns, and secondly, to carry out health education activities within the community.

### 3.3.2 Human Resource Development and Institution Building

Another underlying principle in the project was to implement the project in close collaboration with the existing institutions using the existing personnel. Rather than hiring additional personnel, it was clearly more appropriate to work with the existing field staffs from the Departments of Social Affairs and Sanitation who were already responsible for carrying out community development activities in the target regions.

The social affairs and sanitation field agents have had two to three years of professional training either at the Ecole Nationale de Formation Sociale or at the Ecole Paramedicale. The professional training which they receive includes courses in community development, health education, project development, and evaluation. However, that training tends to be rather theoretical. In the project, the goal was to reinforce their earlier training through in-service workshops, particularly in terms of community development. This training focused on the practical skills necessary for working with rural communities and organizing local development activities. In the two regions, the project activities were, likewise, implemented in collaboration with the Water Services (Service Hydraulique).

### 3.3.3 Participation of Women in the Project

In rural Sub-Saharan Africa, the central role played by women in domestic activities related to water, hygiene, and sanitation is well-known. However, many community water projects have not systematically integrated women into the planning and management of community water supply activities. In this case, at the outset, women were defined as the main beneficiaries of the project activities and the intent was to insure their active participation at all stages of project development and implementation. Attempts were made to discuss the project objectives with women, to elicit their opinions with

regard to the organization of the different community-level activities, to take into account their needs, and to assure their involvement over time. Specifically, women were to participate as members of the Village Development Committees and later as volunteers responsible for the pumps and as ORT volunteers.

#### 3.3.4 Overall Strategy for the Development of Training Activities

The project developed a systematic strategy for the planning and follow-up of all training activities, from the region to the village level (see Figure 2, below). The strategy includes the initial regional level planning of a given community training activity; the development of a training-of-trainers workshop for field agents; the training of community members by the field agents; the supervision and follow-up of the trained villagers; the evaluation of each activity, and, based upon that evaluation, improvement in the organization of that activity. The overall strategy was very carefully laid out, and its systematic use has led to the development of extremely well-planned training activities. The planning strategy itself has evolved during the life of the project and has been modified and systematized over time.

#### 3.3.5 Participatory Training Methodology

Participatory training methodologies based upon adult education principles was systematically used at all levels from the region to the village. Training is defined as a process of problem-solving and exchange between trainers and trainees. Training is based upon the every-day experiences and tasks which the trainees are expected to carry out. During the training sessions trainees have the opportunity to discuss and, in many cases, to practice the tasks which they will later be responsible for in their communities.

#### 3.4 Training of Social Affairs and Sanitation Field Agents

The training of the field agents is carried out on two levels. For each new training activity, several field agents are chosen as "lead trainers" and are responsible for planning and conducting the training of trainers or the entire group of 120 field agents. Secondly, the field agents train villagers. The field agents received three types of training:

Community Relations: This includes assessment of community health problems, organization of community health committees, interpersonal communications, supervision techniques, micro-project development, management of micro-projects, training of trainers, principles of adult education, group dynamics, planning health education campaigns, evaluation techniques for agents and villagers, and using interpreters in village work.

Technical training: This includes pump maintenance and repair, spring capping, cistern construction, latrine construction, gardening methods, guinea worm eradication, ORT, and accounting.

Figure 2

Strategy for Development of Training Activities

| <u>Step</u>  | <u>Who participates</u>  |
|--|--|
| Global planning of the activity<br>(for example: training of Women<br>ORT Volunteers)                        | National Project Coordinator,<br>Regional Social Affairs and<br>Sanitation Supervisors,<br>Technical Assistants      |
| Preparation of the villager<br>training program including<br>teaching materials for use<br>by the volunteers | Regional Supervisors, Lead-<br>Trainers, Field Agents,<br>Technical Assistants,<br>Peace Corps Volunteers            |
| Preparation of training program<br>for the agent-trainers who will<br>in turn conduct field agent training   | Regional Supervisors, Technical<br>Assistants  |
| Train field agents who will train<br>village volunteers  | Regional Supervisors, Lead-<br>trainers, Technical Assis-<br>tants, all field agents, and<br>Training Administrators |
| Training Women ORT Volunteers  | All field agent-trainers,<br>Women ORT Volunteers from<br>each village   |
| Women ORT Volunteers carry out<br>activities in their villages   | Women ORT Volunteers in each<br>village  |
| Follow-up of Women ORT Volunteers<br>in each village   | Field agents, VDCs   |
| ORT activity is evaluated by<br>the field agents and by the<br>villagers                                     | Field agents, VDCs, Women ORT<br>Volunteers  |
| Field agents conduct periodic<br>refresher training for Women<br>ORT Volunteers                              | Field agents   |

Planning and evaluation workshops: Normally these planning and evaluation workshops took place four times a year to plan the upcoming activities and to evaluate activities completed or being implemented.

### 3.5 Community Organizing and Training of Villagers

The community organizing and training activities at the village level were to include the following:

- (1) organization of Village Development Committees
- (2) training of village pump mechanics
- (3) training of women volunteers responsible for pump maintenance
- (4) training of latrine maintenance volunteers
- (5) training of cistern maintenance volunteers
- (6) training of women ORT volunteers
- (7) organization of health education campaigns
- (8) organization of literacy campaigns and training of trainers
- (9) support for health education activities in the primary schools
- (10) implementation of village micro-projects

Follow-up at the village level of the VDCs and other village volunteers is insured by teams of field agents. Normally the team is made up of two field agents and has responsibility for supervising between 7 and 25 villages. Theoretically, each team visits each village once a month.

#### 3.5.1 Organization of Village Development Committees (VDCs)

The VDCs were to be organized in all villages in the two regions where the project was operating. Initial organization of the VDCs takes at least 6-12 months with a field agent providing periodic follow-up to each village. Once a village has thoroughly understood the role of the committee and has chosen a president, secretary, treasurer, and advisors, the officers participate in a one-day "VDC Officer Training" session. This training includes: the responsibilities of the president, secretary, and treasurer; how to create and fund a community treasury; how to open a bank account; how to obtain spare pump parts; and how to plan and run VDC or community meetings.

After the VDC Officer Training, the field agents are expected to visit each village periodically to follow up on the committees and to see whether or not they are carrying out their responsibilities as discussed in their training.

#### 3.5.2 Training of Village Pump Mechanics

In each village where a pump is installed on a borehole, the VDC is supposed to select two community volunteers who can be trained as pump mechanics. The pump mechanic training is one day long and brings together volunteers from

several villages at a time. The village mechanic is responsible for carrying out preventive maintenance and small-scale repairs. For major repairs, the mechanic is instructed how to contact the regional mechanic from the ministry water department.

### 3.5.3 Training of Women Volunteers for Pump Maintenance

The project believed that it was very important that the community be involved in maintaining the pumps once they were installed. In the early years of the project, the VDC was supposed to organize the community to assure the daily surveillance of the pump. The results of this first approach were that the community as a whole did not take systematic responsibility for the pump. It was then decided, alternatively, that community women would be chosen for the task.

In villages where pumps were to be installed, one woman was selected per pump by the villagers and these women participated in a one-day training workshop. Their training included: the importance of cleaning around the pump and good drainage; protection of the pump from animals; correct usage of the pump; identification of a malfunctioning pump; the organization of the village women to clean around the pump; and how to solve conflicts among the women regarding pump usage.

### 3.5.4 Training of Latrine Maintenance Volunteers

Similar to the cistern volunteers, in the villages where latrines were built, one villager was chosen for each latrine to supervise the cleanliness and maintenance of the latrine. Latrine volunteers were trained in the villages while the latrines were being built. This process often lasted for several weeks in one village.

### 3.5.5 Training of Cistern Maintenance Volunteers

In the villages where no underground water was found and cisterns were built, one family member was chosen per cistern to be responsible for its maintenance and supervision. These volunteers were chosen by the community and their training took place in the village while the cisterns were being built.

### 3.5.6 Training of Women ORT Volunteers

The rationale for the training of women ORT volunteers was two-fold. First, this was a water-related health education activity which was integrated quite naturally in the overall water and sanitation project. Secondly, given the role of women in treating child diarrhea, the introduction of ORT into the villages was considered to be a very logical way to increase women's participation in project activities. In each village, one woman was selected by the other villagers from each neighborhood. The women who were selected attended a one-day training session. The first training of ORT volunteers was in May of 1986. The content of the training included: discussion of the relationship between diarrhea and dehydration; the prevention of diarrhea; preparation of the "health drink;" adult education principles; and the role of the volunteers in conducting health education sessions with their neighbors.

### 3.5.7 Health Education Campaigns

Six health education campaigns were planned to address different topics related to water use. It was anticipated that during each of the six-month campaigns a number of activities would be organized in each of the regions. The issues to be covered in the campaigns included the impact of water, sanitation, nutrition, and drugs on health.

### 3.5.8 Organization of Literacy Campaigns

In the work with the VDCs, the widespread illiteracy amongst the villagers has constituted a major handicap for them. In 1984 planning began to train already literate village volunteers who would in turn conduct literacy classes for other villagers. It was anticipated that literacy campaigns would be conducted in 350 villages.

### 3.5.9 Support for Health Education Activities in the Primary Schools

In the villages where there is a primary school, the project was to carry out a number of collaborative activities with the school teachers to reinforce their health education component.

### 3.5.10 Implementation of Village Micro-Projects

As an adjunct to the water-related project activities, micro-projects were envisioned. They were to be short-term, low-cost projects intended to address one or more health problems which the villagers had identified through a community health assessment which they themselves had carried out. The VDCs had the major responsibility for developing these projects in collaboration with the field agents, through a series of five community planning meetings.

### 3.5.11 Results

The results of project training and health education compared to objectives are shown in Table 5.

An average of about 70 days of training in health education and community development per agent was provided and an average of about 16.5 days of training in construction techniques. It is estimated that 10,000 person-days of formal training seminars were provided to Village Development Committees in 1,058 villages or about 10 days per village and about 2 days per member. Informal training by field agents was not counted in these totals.

While training in the previously mentioned categories was somewhat less than planned, the training for pump repairmen and women caretakers was about four times more than planned. This was due to the recognition that pump maintenance is a very critical component of project sustainability.

**Table 5**  
**Outputs of Training and Health Education Component**

| Task   | Expected<br>Outputs | Total<br>Outputs | Difference |
|--|---------------------|------------------|------------|
| Training of agents in<br>community development<br>and health education | 9,600               | 8,400            | -1,200     |
| Training of agents in<br>construction techniques                       | 2,880               | 2,000            | - 880      |
| Training of workers in<br>construction techniques                      | 2,000               | 1,800            | - 200      |
| Training of Village<br>Development Committees                          | 16,800              | 10,000           | -6,800     |
| Training of villagers<br>in pump maintenance                           | 1,440               | 6,000            | +4,560     |
| Village health education<br>campaigns (ORT, latrines,<br>guinea worm)  | 6<br>campaigns      | 6<br>campaigns   |            |
| School health education<br>campaigns                                   | 300<br>schools      | 50<br>schools    | -250       |
| Literacy campaigns   | 350<br>villages     | 11<br>centers    | - 339      |

Six health education campaigns were completed although the themes of the campaign were modified in comparison to what was originally planned. School health education was undertaken in collaboration with other institutions, UNICEF, and the Ministry of Education. The time required to define the roles of each institution resulted in many fewer results than planned. The 50 schools that participated were considered a pilot experience, and more school training is expected in the future.

Literacy was not begun until the end of 1986, and less emphasis was placed in this activity. The 11 pilot centers that were completed covered many villages.

Financing for micro-projects was eliminated by USAID and therefore no micro-projects were undertaken.

### 3.6 Effectiveness of the Training and Community Organizing Activities

#### 3.6.1 Human Resource Development and Institution-Building

The implementation of the project community organizing and training activities by the Social Affairs and Sanitation field agents as opposed to having recruited temporary personnel for the life of the project is believed to have been a sound approach. There is a general consensus among the Social Affairs and Sanitation directors and the field agents from the two departments that the overall impact of the project on their programs was very positive. The project provided both logistical support and training to ministry personnel which strengthened their capability to effectively implement rural development activities.

#### 3.6.2 Strategy for the Development of Training Activities

The strategy used in the project for the planning of all training activities was initiated at the national and regional levels with field-agent lead trainers responsible for the initial planning of a given training activity. Secondly, the training of field agent trainers was planned along with community organizing and training sessions for the villagers themselves. This systematic planning strategy is something which was refined over time and which is regarded highly by all of the ministry field staff. It is clear that the success of the different training and community organizing activities carried out in the context of the project can be attributed, to a great extent, to the detailed and careful planning which preceded the implementation of each new activity.

The planning process included a clear definition of the tasks to be carried out by the particular category of individuals once they were trained; the definition of the objectives of each training activity; the development of a manual for use by the training agent describing exactly how each session should be carried out; and the development of the training material necessary for each session. The results of this rigorous preparation are very high quality training materials which can be effectively used by the training agents in conducting training themselves.

What is significant with regards to the training development strategy used in the project is, on the one hand, the excellent quality of training programs which were developed and, secondly, the fact that the field agents learned how to work with a systematic methodology for planning training which should be of use to them in the future. It is important to note that considerable time and human resources were required for the systematic use of this training planning strategy. It is believed, however, that the use of such resources was justified. It should be noted that very often in training programs, the time required to develop sound training activities is underestimated and in the long-run the quality of the programs suffers.\*

### 3.6.3 Training of Social Affairs and Sanitation Field Agents

#### Content

The training had three components:

- community relations: approximately 70 days of training per field agent
- technical training: approximately 16.5 days per field agent
- planning and evaluation workshops: approximately 72 days per field agent.

These figures represent the number of days of training received during the seven years of the project.

Perhaps the most striking aspect of the content of the training which the field agents received is that, while the technical training content was very important, the training in community relations, planning, and evaluation was more important in terms of the number of days of training devoted to it. The training in community relations included methods of community needs assessment; community organizing; planning and management of community development activities; training of trainers; supervision and evaluation of these activities. The third component of training consisted of the monthly planning and evaluation workshops where the techniques learned in earlier training sessions were applied to the ongoing project activities.

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\* It is interesting to note, as well, that in light of the quality of the community organizing and training programs developed in the USAID Rural Water Supply and Sanitation Project, a similar project which was launched in 1985 in the Maritime region of Togo, with assistance from the Canadian organization CUSO, is using those training programs almost in their entirety.

It is believed that the importance given to community relations in the field agent training was justified and necessary in a rural water supply project of this sort. Very often, in projects where new technologies are to be introduced into communities, the training of field agents deals only with the technical aspects of the innovation, the material used, construction, and maintenance techniques. Frequently, field agents are not carefully trained in how to establish rapport with communities; and how to introduce an innovation into a particular social setting and be reasonably assured that it is understood by the community and that they will use and maintain it over time.

Discussions held with field agents in the two regions confirm that the training they received was relevant and very practical relative to their former training and their everyday community work. For the sanitation field agents, whose professional training was mainly technical, the training in community relations planning and evaluation was new, and they found it to be very useful. In the case of the social affairs field agents, community relations are dealt with in their professional training. Nevertheless, all of the agents reported that the project training gave them skills which were much more practical, relative to what they had received in their earlier training.

#### Methods

Participatory training methods were used in all of the training for the field agents. In light of the positive results which accrued from the use of these methods the choice appears to have been very appropriate. Prior to the project, participatory methods were not systematically used by the ministry trainers and the project Technical Assistants played a major role in introducing their use into all training activities.

It is important to note that the use of participatory methods, relative to the more traditional training methods of lecture and discussion, requires considerably more time for planning and, secondly, requires greater skill on the part of the trainer. It is clear, however, that in the training of adults, participatory methods are much more effective in terms of the knowledge and skills which participants acquire.

Participatory methods were systematically used in the training of the field agents, and their evaluation of the approach was very positive. In the interviews conducted with agents in the field, they repeatedly commented on the usefulness of the training sessions where experiences were exchanged and common problems addressed through small group discussion, role plays, brainstorming exercises, etc. They reported that the training sessions were very lively and at the same time they acquired many practical skills for carrying out their everyday responsibilities with rural communities. The training of the agents in the use of participatory methods began when they took part as trainees in training sessions. Later, they participated in training-of-trainers workshops where the goal was for them to learn how to conduct training themselves using participatory methods.

### Training of Lead Trainers

In keeping with the strategy for the development of all training activities (see Figure 2), each time there was to be new training, several field agents were involved in planning it at the village level and in conducting the training-of-trainers for the field agents who would in turn train the villagers. The small group of agents who were responsible for preparing the training programs and training the other agents were called "lead trainers" whereas those who were to train the villagers were called field agent-trainers. While for each new training activity several lead trainers participated in the planning, responsibility for the development of the overall design was usually that of the Technical Assistants.

In a project of this size and duration, it would seem reasonable that by the end of the project, there would be a nucleus of national trainers with strong skills in all aspects of designing, facilitating, managing, and evaluating training programs. But unfortunately, this did not happen. The training that the lead trainers received, working with the Technical Assistants, emphasized training skills. Facilitation skills are only one set of skills required of someone who must plan and implement training programs from start to finish.

Three factors were identified which seem to have contributed to this weakness in the project and which can hopefully provide some constructive ideas for the organization of future projects. First, during the entire seven years of the project, there were never any Togolese personnel who had full-time responsibility for training activities. Secondly, the training and health education Technical Assistants never had full-time Togolese counterparts. Thirdly, during the life of the project none of the Togolese field staff participated in either short- or long-term training programs in adult education or in the planning and management of training programs. This issue was discussed with the National Coordinator of the project and he agreed that the project had not done everything possible to strengthen Togolese training capabilities so that a core of national trainers was prepared to assume full responsibility for directing similar training programs in the future.

### Follow-up of Field Agents

Theoretically, the training received by the field agents should be reinforced during follow-up visits by the regional supervisors and Chefs de Secteur. There are four regional supervisors, one each for community development, sanitation, water resources, and literacy. They are responsible for supervising the agents' work in the field. At the prefecture level, the Chef de Secteur is responsible for supervising their activities and normally should arrange a meeting once a month for the field agents in his area to discuss their activities and to identify problems. In reality, the frequency with which these meetings take place varies and it does not appear that the agents' activities are supervised as closely as desirable.

In projects which include the training of field agents, supervision of such agents following their formal training is of critical importance for the reinforcement of the work they carry out in rural communities. In this project, the supervision of field agents could have been done on a regular basis and in a more systematic fashion.

### 3.6.4 Community Organizing and Training of Villagers

#### Approach to Community Participation and Organization

The goal of the community organizing component of the project was to help villages organize themselves in order to solve a specific problem: that of access to potable water. The assumption was that once they had successfully dealt with the water problem that they could use the same organizational base to deal with other community problems. In the project, communities were systematically involved in each step of the process of introducing the new water technology into the village.

According to a recently published WASH study (Ref. 18) on the role of community participation in community water projects, such involvement of the community is reported to be justified. Two of the conclusions made in the study are:

- 1) to be effective and sustained, a water supply project must have community participation
- 2) community participation must be integrated with the hardware components of a water supply project and must be planned with equal care.

At present, there appears to be a consensus that community participation is necessary for the success of such projects in the long run. Often, however, the community organizing component is insufficient to assure coherent and sustained community participation.

In this project, the methodical planning of the community organizing component, as well as the allocation of considerable human resources for its implementation, contributed significantly to the overall success of the water supply and sanitation activities in the villages. Of course, the community level activities already in place will need to be reinforced, but in light of the extent to which villages at present have assumed responsibility for community water and sanitation activities, one can say that the community organizing effort of the project was, overall, appropriate and effective.

#### Content of the Community Organizing and Training Programs

The community organizing component included a series of meetings and discussions carried out by the field agents with community leaders and members and training workshops attended by delegates from different villages. The steps in the community organizing process were the following: explaining project objectives and activities to the community; the creation of community development committees; training the officers of the committees; the selection and training of village volunteers (pump mechanics, women responsible for pump maintenance, women ORT volunteers); and follow-up, evaluation, and periodic retraining of the committees and volunteers.

The steps in this process of community organizing were very clearly spelled out. For each step, there were certain topics that were to be discussed with the villagers and certain decisions that they needed to make. The content of the meetings and formal training which the villagers received dealt, on the one hand, with technical issues related to the pumps, cisterns, latrines, ORT, etc., but in the villager training, the greatest emphasis was put on techniques of identifying and analyzing community problems, organizing the villagers to carry out a specific activity, and the planning, management and evaluation of community activities.

The starting point for the community training activities was a clear definition of the tasks which the members of the Village Development Committee and each type of volunteer would be expected to carry out. The training workshops for the villagers included discussion of those tasks; the steps to be followed and the skills required to carry out each of the tasks; the problems which could be anticipated in accomplishing the tasks; and the possible solutions to those problems. The training program for the village committees and volunteers was developed in a very detailed fashion so that everyone involved, from the region to the village level, knew exactly who was responsible for what in each of the different activities.

#### Training Methods Used in Village-Level Training

The participatory training methods used in the training of the field agents were also used in the training of the villagers. Members of the final evaluation team attended one of the village-level training workshops for village pump mechanics, and the overall impression was very positive regarding content and training methods. The use of participatory methods by the agent-trainers was noteworthy. Their participatory facilitation skills were very strong. It is important to point this out because, while many training programs use participatory methods in training field agents, there are very few programs where the field agents themselves successfully use these same methods. The training skills of the field agents must be attributed to a large extent to the quality of the training which they received in the project.

In the training of the villagers, the participatory methods proved to be very appropriate and effective in conveying the knowledge and skills necessary for the implementation of their community tasks. It is important to note that most of the villagers who were trained are illiterate. The evaluations of the villager training completed by the villagers themselves indicate that they did understand the content of the training and that they found it to be very practical with regard to their respective tasks. The small group work, the role plays, the practical exercises included in the workshops elicited the active participation of the trainees and in a majority of cases resulted in their mastery of the training content.

### Follow-up of Villagers after Training

The organizing and training of the village committees and volunteers was carried out during the formal training workshops, but of perhaps equal importance was the follow-up of the committees and volunteers once they were trained. One of the field agents said, "Even if the training is perfect, you cannot be assured that once the person returns to his/her village that he/she will be able to put into practice everything taught during the training workshop." Follow-up supervision is extremely important to reinforce what is taught and to help the committee or volunteers solve problems that they encounter in carrying out their tasks in the village.

Theoretically, each field agent is supposed to visit each village once a month. It seems that one visit per month to each village is a necessary minimum which allows the field agent to help the committee or volunteers to solve problems encountered and to provide support and encouragement to the villagers for the work which they are doing. However, it was observed that the field agents are not always able to make one visit each month to each village. At times, agents are required to work almost full-time for several weeks in only one village to supervise, for example, latrine construction. Another limiting factor is the number of villages which each agent is supposed to supervise. In the discussions the evaluation team had with 15 of the field agents the responsibilities of each ranged from 5 to 32 villages, with 5 of those agents being responsible for more than 20 villages. It is clear that between the agent who must supervise 32 villages and the one who is responsible for only 5, the quality of supervision varies. In the future, it would be advisable to review the allocation of villages agent-by-agent to assure a more equitable division of supervision.

## Chapter 4

### COMMUNITY DEVELOPMENT

#### 4.1 Resources

The resources made available by the project for the formation and training of Village Development Committees (VDC) were most significant in comparison to other projects and represent the particular emphasis which has been placed on community development by this project. Most of the resources necessary for community development were provided in the form of field agents and by selected members of the villages themselves who served on the committees. During the life of the project, between 100 and 120 agents were active full-time (many agents were also responsible for activities in villages other than project villages). Their salaries constituted the largest expenditures within community development as described in Chapter 2 and represent the primary financial contribution of the GOT to the project. Transportation was provided by USAID by purchasing motor bikes and fuel for each of the field agents. It is worth noting that about 25 percent of total project costs were earmarked for community development and health education.

#### 4.2 Organization

The socio-health program within the project was based on three guiding concepts: "community participation, health education for action, and success analysis." These concepts were described in Chapter 3 and are more fully explained in various project documents (Ref. 5). The socio-health program was designed to proceed through five distinct phases of activities. They are:

- (1) Installation of Village Development Committees
- (2) Training of VDC presidents, secretaries, and treasurers
- (3) Identification and analysis of village health problems
- (4) Micro-project implementation
- (5) Health education campaigns.

##### 4.2.1 Creation of VDCs

The VDCs were created through a series of four village-level meetings between the field agent and the villagers themselves. The meetings were designed to discuss project activities, objectives, and mutual responsibilities (including pump repair and maintenance). Criteria for the selection of VDC members were suggested, and ultimately the villagers chose between 9 and 13 members. The fourth meeting included an installation ceremony and the signing of a contract between the village and the project which states the responsibilities of each party.

In general, the committees consisted of the following individuals, although some variations exist among villages.

- President
- Secretary
- Treasurer
- Pump repairman (2)
- Woman pump caretakers (2) (femmes responsables)
- Woman oral rehydration therapy demonstrator (2)
- Counselors (0-4)

#### 4.2.2 Training of VDC Members

All of the above named individuals received training for their specific positions with the exception of the counselors. The training was described in detail in Chapter 3. Emphasis was placed on committee organization, record keeping, accounting, and communication skills, in addition to the technical training in pump repair, ORT, etc.

The requirement that villages be responsible for their own pump operation and maintenance was particularly emphasized. Suggestions for collecting and accounting for maintenance funds were also provided to the committees.

#### 4.2.3 Identification and Analysis of Village Health Problems

In order to guide the villagers in problem solving, agents asked the VDC to carry out a village survey to identify problems themselves. Subsequent discussions of limited resources led to strategies for alleviating problems. While the project emphasized health problems, the approach was not limited to health issues, but addressed any problem such as education, agriculture, etc.

#### 4.2.4 Micro-projects

Micro-projects were conceived as a natural extension of the village development process whereby funds would be made available to VDCs which were able to identify and address village problems. Although significant progress was achieved in many villages and programs approved for funding, the micro-project program was eliminated before implementation began. This was a decision made by USAID, apparently because of limited funding and other programmatic reasons.

It was unfortunate that the micro-project was eliminated, because many villages had been promised funding support, and some project credibility was lost. It was also clear to the evaluation team that many VDCs are capable of and interested in advancing beyond their present level of activities and small grants would be usefully employed. Elimination of the program undermined a key element of community development strategy, that of community self-evaluation and initiation of new efforts at problem solving.

#### 4.2.5 Health Education Campaigns

Several health themes have been developed and promoted through periodic campaigns during the life of the project. The campaigns have been conducted throughout the project area and practically all VDCs have participated. Lesson plans for these themes were developed and field tested before implementation. The themes have included the following:

- Our Pump. Our Responsibility. Our Health
- Water as medicine
- Guinea worm
- Causes of diarrhea
- Village hygiene (Village cleanliness)
- Building garbage sites
- Pump maintenance
- Latrine utilization
- Oral rehydration therapy

#### 4.3 Results

Expected outputs, as indicated in the Project Agreement, called for about 350 villages to be equipped with a water supply system and to have a village committee established. With the extension of the project and the increase in numbers of wells to be equipped, village committees were to be established at all project villages, although no specific number was indicated. In total, 864 VDCs have been established and training provided to each of these committees. An estimated 600,000 people live in these villages which is more than double the initial number of 245,000 expected beneficiaries.

It should be noted that many villages have populations that exceed the capacities of the pumps to provide all of their water needs. Therefore, not all of the villagers receive equal benefits from the wells. It is best to assume that the majority of the 600,000 have fully benefited from project activities, but that the rest have received less than full satisfaction.

Training has also been provided for 1,778 women pump caretakers and 3,361 women ORT demonstrators. Children and youth of the village were not addressed in any specific manner but have played roles in construction and other community activities.

#### 4.4 Efficiency

The efficiency of project activities in achieving objectives within the socio-health program constituted an important part of this final evaluation effort. Much of the field observations and focus of the questionnaire related to activities of the field agents and the village development committees. Specific issues within community development are addressed in the following sub-sections.

#### 4.4.1 Roles of Committee Members

During the field visits the evaluation team posed specific questions to members of VDCs. Their responses in comparison to the training they had received indicated that all (100 percent of those interviewed) understood their roles, with the exception of committee counselors. A majority (70 percent) of the counselors were able to explain the overall role of the VDC and their contribution. In reality their role was less well defined by the project and was not of critical significance to project efficiency. Questions posed to villagers at large indicated a good understanding of the roles of the VDC.

#### 4.4.2 Participation in VDC Tasks

Full participation by villagers was found in all villages (100 percent) sampled in the following tasks:

- Contribution to maintenance fund
- Purchase of cement for well aprons
- Procurement of sand for construction
- Manual labor in construction
- Lodging for project workers
- Digging of latrines
- Cleaning of area around wells
- ORT campaign

Other activities which were undertaken by certain villages under the direction of their VDCs included the following:

- Feeding of project workers
- Road construction
- Construction of market centers, school buildings, and pharmacies
- Cleaning and removal of unwanted vegetation around villages

#### 4.4.3 Capabilities of Committee Members

Overall, the committee members were found to be sufficiently trained and capable of fulfilling their individual roles. Some exceptions existed.

Treasurers in several cases were not keeping their books in order. This was clearly attributable to limited reading abilities. In some cases the agents or other members of the communities were helping the treasurers with their bookkeeping. In all cases, however, there was a knowledge of the present balance in the accounts and at least a remembrance of expenditures. No evidence was found of any misuse or theft of funds in the villages.

The literacy campaign was clearly a project attempt to alleviate this situation and is well advised in its focus. Most villages have but a few people who are fully literate. While having illiterate treasurers is clearly not recommended, the collective wisdom of the villagers in selecting respected individuals may be as important in assuring the accounting of VDC funds as any other criteria. Adding the literacy campaign to a project that focuses on water and health was commendable in its intentions, although relatively little progress, in comparison to objectives, was made. Clearly, literacy is a subject that deserves more attention in Togo and may be more efficiently accomplished in a separate project.

Women pump caretakers (femmes responsables) were found to have a somewhat incomplete understanding of their role in comparison to the roles delineated in the project manuals. None of the caretakers were capable of naming all eight tasks, but most of them were able to name at least four. All of them indicated that organizing the cleaning around the well was important, and most of the caretakers indicated that pump surveillance and alerting the mechanic of breakdowns were major tasks. Only one-third of the caretakers attended VDC meetings.

#### 4.4.4 Fund Raising

Fund raising for pump repairs was successful for all the VDCs visited by the evaluation team. In 70 percent of the cases the accounting books were complete. Of the 16 villages visited, there was an average of \$162 (cfa 58,324) in the VDC accounts, ranging from a high of \$770 (cfa 277,174) to nothing. In the latter case, the village had recently spent its funds on a repair and had not yet replenished the account. The project has recommended the VDCs maintain a fund of about \$139 (cfa 50,000), although for certain repairs, such as replacing the hydraulic diaphragm on the Vergnet pumps, the funds are not sufficient. In most cases funds have been generated by proceeds from collective agricultural fields.

#### 4.4.5 Villagers' Understanding of the VDC

During visits to the villages questions were directed specifically to villagers at large regarding the VDCs. Their responses indicated that there was a general understanding of the role and responsibilities of the VDCs. Further, the health messages that were being transmitted by the VDCs were adequately understood. Responses by villagers to questions relating to the relation between clean water and diarrhea, for example, were impressive in their accuracy. Similarly, the value and use of ORT was generally understood by the villagers. Of particular importance was the clear acceptance of the pump as belonging to the village and of the village's responsibility for maintaining it.

#### 4.5 Impacts

Impacts upon the village beneficiaries are not generally expected to be evident in a project of this type in the short term. Other studies indicate that there may be significant reductions in diarrheal morbidity and mortality when water supply, health education, and latrine construction are combined in one project area. Median reductions of about 37 percent in morbidity from diarrhea have been documented in such cases. Water supplies have been improved, and health education has clearly been effective within the project area, but latrines have been constructed in only a few villages. Furthermore, the lack of project baseline data did not allow valid comparisons of pre-project and post-project health status. Nor for that matter should a project of this type be judged by a single health criterion, such as infant mortality, since there are many other potential benefits, both health and otherwise. Nonetheless, there is some indication that the project produced health and other social benefits.

##### 4.5.1 General Health

Questions directed to villagers concerning their perceptions on the incidences of diarrhea both among adults and children suggest that reductions have occurred among many individuals. A reduction in stomach pain was also reported, as were suggestions that infant mortality was reduced. It is recognized that such responses are hardly conclusive and that there is a risk of prompting desired answers, but, nonetheless, there appeared to be a real perception among villagers and field agents as well that health had generally improved.

##### 4.5.2 Guinea Worm

Among health benefits the eradication of guinea worm disease was stated as an accomplished fact in several villagers in the Plateau Region. The responses among villagers were striking in their certainty that guinea worm was actually no longer an occurrence for those people with access to improved water supplies. This was said to have occurred even in one village where a cistern was constructed which provided only five liters per capita per day, an amount sufficient only for drinking and cooking. The remainder of water needs came from a stream. Again, such responses should be verified through a rigorous testing program, but as an indicator, it appears that there has been an impact of the project on reducing guinea worm.

##### 4.5.3 Women

As explained in Chapter 3, the project developed strategies specifically aimed at enhancing the role that women were to play in the project. The most direct evidence of this was that two positions, that of pump caretaker and ORT demonstrator, were specifically dedicated to women. The participation of women in these positions has been important to project success. This was particularly true in the ORT program which appeared to offer enhanced prestige to the participants. In a few instances women were said to hold positions as president or secretary on the VDC, but this was rare.

There seemed to be some variation among villages as to whether the women were full participating members of the committee. In some cases committee decisions were consistently made without the participation of women members or, for that matter, all of the men members.

While it is clear that women have played a greater role than might be expected compared to traditional roles, in the future continued support will be needed to further enhance their role. Possibly a specific number of women on each committee should have been a criterion of VDC formation. Projects, as a matter of course, should establish specific objectives for the roles and numbers of women to be involved.

There was significant interest by women in the proposed micro-project activities and, with its deletion, disappointment. It is expected that future VDC activities would involve women to a large degree and provide an economic bonus.

It is always necessary in a successful water project to assume that new water supplies will save a significant amount of time for women and that they will therefore be able to take over additional domestic activities and participate more fully in community activities. For many women in project villages this was doubtlessly true.

Some other indicators of positive behavior change were evident. In the event of a pump breakdown people were asked what their strategy would be to procure water for their immediate needs. It was obvious that if the pump was not repaired within a few days then they would necessarily resort to fetching water from the old sources, i.e. rivers or ponds. Most women answered that they would boil their water for drinking if they had to use unclean water. This probably represents a significant behavioral change and a positive health impact.

It may be further surmised that other impacts in terms of health and generally improved living conditions have accrued to women as well as men and children. Direct evidence of impacts are often difficult to measure, even if there had been a pre-project base line study. None the less, the evaluation team is confident that, because of the overall success of the project in meeting most of its objectives, the project goal of improving the living conditions of the Togolese rural population has been achieved. Improvements in health conditions and the potential for productive activity have been made as well, and this is particularly true for women within the project.

## Chapter 5

### CONSTRUCTION

#### 5.1 Boreholes

##### 5.1.1 Resources

Financial resources were provided by USAID for well drilling and casing and also for the hydrogeological studies of site selection. The FED also provided funding for some of the earlier site selection activities.

The GOT provided personnel for borehole design, village selection, village mobilization, and site selection. BRGM, in its role of drilling supervisor provided a hydrogeologist as Chief of Mission and a field hydrogeologist for the duration of operations. In addition, a geophysicist was employed short-term for six months.

The firm of GRIFFIN-INTRAFOR, Inc., as contractor for drilling operations, utilized a Chief of Mission, Works Director, Chief Mechanic, two Chief Drillers, and a group of local rig hands for well construction.

Sites were selected through the use of aerial photographs at a scale of 1/30,000 and 1/50,000. Geophysical techniques were also applied in some instances. The drilling firm employed two fully equipped rigs, a pump development unit, a pump test unit, and a fleet of support vehicles.

In summary, the equipment, materials, and techniques employed were appropriate and well adapted to the drilling conditions.

##### 5.1.2 Organization

Borehole design and site selection for boreholes was completed by a group of technicians from BRGM and the GOT Directorate of Water and Energy (Direction de l'Hydraulique et de l'Energie (DHE)). Borehole specifications were formulated by the technical group and approved by USAID. Requests for bids were solicited on an international basis and ultimately a contract was let to the firm of GRIFFIN-INTRAFOR, Inc.

Borehole site selection was begun in August 1981, with the development of a list of prospective villages. The village lists were established jointly by the Directorate of Water and Energy (DHE) and Social Affairs (DGAS) under the direction of the project Regional Committees. Village selection criteria were the following:

- degree of water need
- size of population
- accessibility to drilling equipment
- groundwater characteristics of geologic formations.

Two techniques were used in specifying the drilling site within or near selected villages. The first relied upon the study of aerial photos to delineate features which suggested the possible presence of groundwater such as faults, vegetation patterns, and geomorphological structures. A subsequent field visit by a Social Affairs agent was required to verify the photo assessments, to determine accessibility, and to obtain approval from the villagers for the proposed borehole site.

A second technique used geophysical instruments in difficult areas where there were no surface indicators of groundwater. Electrical resistivity profiles were completed at 842 points and 52 electrical logs were run covering a total of 375 villages. These techniques reduced the number of dry holes and increased the speed with which the boreholes were completed.

In order to assure optimum borehole depths and to minimize the number of boreholes with low yield, written guidelines were provided to the drilling crews. Decisions on all boreholes with yields of 0.25 to 0.8 m<sup>3</sup>/h were deferred until a decision was made to equip the borehole. For boreholes with yields less than 0.25 m<sup>3</sup>/h a cleaning process was used to increase the yields. For boreholes with yields less than 1.5 m<sup>3</sup>/h the boreholes were deepened and the pumps adjusted to accommodate the greater depths.

Drilling techniques in the weathered crystalline geologic zones included either rotary or down-the-hole hammer techniques with provisional casing installed to prevent borehole collapse in unconsolidated formations. Drilling diameters were 9-7/8 inches with rotary tools and 10 inches with hammer tools. In hard bedrock drilling was done with hammers of 6-1/8 inch diameter. All productive boreholes were equipped with PVC casing of 112/125 mm diameter and gravel packed. After casing the boreholes were developed by air lift and pump testing was completed with step drawdown methods.

The techniques employed in drilling operations were particularly well adapted to the geologic conditions within the project zones. The drilling success of 66 percent productive boreholes is considered good in relation to the rather poor aquifers, particularly in the Plateau Region. Overall water quality from a mineral perspective is considered very good (see Chapter 7).

### 5.1.3 Results

A total of 1,578 boreholes were attempted in 857 villages, of which 1,048 productive boreholes were completed in 760 villages. In addition, 18 boreholes were completed within the project by BRGM with UNDP financing thus exceeding the project objectives of 1,050 boreholes.

It was noted that the project decided to maximize the number of villages which received a well at the expense of fully equipping individual villages. The capacity of the Vergnet pumps is suitable for a maximum of 250 people. With an average population of over 700 people it was evident that many villages were underequipped. It is understood that the decision to maximize the number of villages was a political decision, but, from a development perspective, fully equipping fewer villages would have had a more positive effect.

#### 5.1.4 Efficiency

The efficiency of borehole construction was normal for such operations. In the first two campaigns 34 boreholes per month were drilled with two drilling rigs, and in the third campaign 38 boreholes per month were completed. Scheduled for a duration of 54.5 months, drilling was completed in 44 months. During field visits by the evaluation team all of the 15 boreholes visited were found to be in good condition although three wells were not operating because of pump problems.

In the beginning of the project, collaboration between the borehole drilling component and the village social affairs component was not effective. Overly optimistic arrangements were made with villages which did not take into consideration the realities of drilling boreholes in low production zones. As the project progressed the two components became better coordinated.

In order to protect the quality of borehole water from bacteriological pollution the project should have required a chemical disinfection after pump installation and after each repair that potentially allowed pollution to enter the borehole. For the future, guidelines on disinfection should be introduced using locally available products such as chlorine bleach. Water quality is addressed further in Chapter 7 of this report. It is further recommended that periodic testing for bacteriological quality be done for all boreholes.

#### 5.1.5 Impact

The construction of boreholes has had an obviously positive impact on the project villages. Clean water is more accessible and for most villagers the time required to fetch water has been significantly reduced. The overall effect on the environment, both physical and social, is positive.

Many villages, however, expressed the desire to have more boreholes and said that their water needs were not satisfied. This indicates not only that the number of boreholes per village population was insufficient in many cases but also that the villagers appreciate the advantages of the boreholes. The villagers also expressed a belief in the health benefits brought by the boreholes.

The drilling component of the project has also had a significant impact on the hydrogeological knowledge available to Togo. This knowledge will prove useful to future water projects and should allow more efficient site selection and higher success rates for developing groundwater.

### 5.2 Springs

#### 5.2.1 Resources

Spring development was recommended by the mid-term evaluation as an alternative technology through which water supply might be assured in some villages. The financial resources for spring development were made available by USAID, as described in Chapter 2, and included material and equipment

purchases, training of workers, and the services of a technical assistant. Agents from the GOT Social Affairs and Public Health participated in the same manner as under the wells component. Villagers contributed labor, sand, and gravel to the construction efforts.

#### 5.2.2 Organization

Designs and workplans were developed by the USAID technical assistant in collaboration with agents from Public Health and Water Development (DHE). Supervision of work activities was the responsibility of an agent from Public Health. Spring development and village mobilization was undertaken by agents from Water Development and Social Affairs, respectively.

#### 5.2.3 Results

Project objectives indicated ten springs were to have been developed but only three were ultimately completed. The difference reportedly resulted from an underestimation of the time required for spring development and a lack of labor because of village agricultural activities. Progress was also apparently slowed by having two agents equally responsible for work activities. This was a duplication of effort and is not recommended for future activities.

#### 5.2.4 Efficiency

The springs appeared to be working satisfactorily but their yields were not sufficient to satisfy total village demand. Village populations are rather large (one village has about 7,000 inhabitants), and many people continue to use the local streams.

It was reported that other springs exist in the area and will need to be developed to satisfy water needs. Piping of water from distant springs needs to be investigated. It is further suggested that low flows of springs need to be fully investigated before sites are selected.

#### 5.2.5 Impact

As with wells, spring improvement affects primarily those closest to the spring. Other water sources tend to exist near springs, and convenience to these other undeveloped sources will be the major influence on villagers in choosing water supplies. The springs clearly offer a major advantage in that no pumping is required which affects operations and maintenance costs.

In one village, Kougnohou, several benefits were mentioned by villagers that were unusual. For example, the women of the village mentioned several commercial enterprises that had resulted from spring improvement; easier access to water made it possible for women to prepare food and sell it at the large market. Even the sale of drinking water at the market by the village youth was a profitable undertaking.

In the Plateau Region spring development offers distinct advantages at selected sites. However, some environmental effects must be considered, particularly in regard to the possibility of pollution. Many of the springs are located in valleys below areas where human and animal activities may be intense. The upper watersheds should be protected if the springs are to remain free from pollution. Periodic testing for bacteriological contamination should be assured for all springs.

### 5.3 Cisterns

Cisterns, as an alternative technology, were incorporated into the project in response to the finding that about one-third of drilled wells were dry and there were no groundwater resources near many villages. The term cisterns refers not only to storage tanks but also to a roof top catchment (hangar) designed to channel water into the cisterns.

#### 5.3.1 Resources

Resources for cistern construction came from three sources. USAID provided funding and a technical advisor for cisterns as well as for other alternative technologies. The funds were used to pay skilled laborers and for the purchase of tools, cement, and other construction materials as shown in Table 2 above. The GOT provided field agents, and the participating villages donated labor and locally available materials such as sand and gravel.

#### 5.3.2 Organization

The construction and maintenance of cisterns were the responsibility of the VDCs. The VDCs organized and mobilized the local population. Originally the villages were to provide workers, particularly masons, who would learn the techniques of cistern construction in order to construct more cisterns and better maintain their own. For various reasons, however, few villages were able to provide masons.

The project provided three types of technicians to assist the VDCs: skilled workers such as masons, carpenters, and iron workers; project foremen who provided organization and supervision at the work sites; and field agents who also supervised some aspects of construction and organization. In order to assure complete understanding of the various responsibilities described above, a contract was signed by the VDC and the project.

The project tried two designs of cisterns in a pilot program before choosing a model called the "Benin Silo Cistern." This cistern incorporated an 80-square-meter rooftop hanger which collected rainfall which fed four cisterns of 6,000 liter capacity each. The cisterns are elevated and constructed of reinforced concrete. They have an automatic device which diverts the first rain runoff which cleans the rooftops before allowing subsequent runoff to enter the storage tanks.

The evaluation team noted the following concerning the design and standards employed in cistern construction:

- The faucet located at the bottom of the cistern was only 30 cm above the ground, a distance which did not allow containers to be easily filled.
- The proportion of cement in the concrete of various sections of the cisterns was excessive by 12 to 25 percent in comparison to construction standards.
- Reinforcing bar, particularly for the foundation, was underestimated.
- The cistern design with covered openings, a faucet for extracting water, and a first rain diversion system assured the cleanliness of water in the cistern.
- The cistern capacity of 6,000 liters was adopted to serve a family of 10 people at a rate of 5 liters per person per day for a maximum of 120 days.
- In the north of the country (Savanna Region) the dry season lasts an average of five months and in the south (Plateau Region) it lasts a maximum of four and a half months. Cistern capacity in relation to reasonable but minimum quantities of water is therefore at the margin.
- The construction process for cisterns consisted of 20 steps which required a precision that was beyond the experience of most village masons. Further, the use of the reinforcing bar required skills of an iron worker in addition to the mason. Conversely, the construction of the rooftop hangar using building blocks was within the capabilities of local masons.

### 5.3.3 Results

The number of cisterns completed by the project totaled 59 hangars with 256 connecting cisterns, compared to the objectives of 126 hangars with 1,541 cisterns (i.e., 17 percent of the target figure). Further, in regard to villages where the drilling program resulted in dry holes, the project provided cisterns as an alternative technology in but a portion of the villages. Of 114 villages with dry boreholes, only 27 (24 percent) received cisterns.

The project clearly did not achieve its objectives primarily because of overly optimistic work schedules. Delay was caused by less-than-expected village participation, farming obligations which took priority over available village labor, the inaccessibility of some villages during the rainy season, and delays in arrival of construction materials. These delays undoubtedly had an effect in increasing the unit costs of the cisterns as well.

The evaluation team noted the following in regard to the finished cisterns:

- The cisterns were constructed with graded sand that was generally too coarse and resulted in fissures in some cisterns.
- The location of the cisterns was usually easily accessible and convenient for villagers, an advantage over drilled wells which are sometimes far from the users.
- The life expectancy of cisterns is difficult to judge since there is so little experience with these models, but estimates of more than 20 years have been suggested.

#### 5.3.4 Efficiency

Cisterns were designed as an alternative technology to collect and stock water of good quality to meet the minimum needs of the resident population. The design standard of five liters per person per day is sufficient for drinking and cooking only. Water for other uses such as bathing, laundry, beer making, animals, gardens, and construction is obtained from streams and ponds. The quality of water from the cisterns was appreciated by the users and, in all cases observed, was found to be clear, odorless, and free of impurities.

The cisterns were located in most cases within 50 meters of the users and so were very convenient. There were no reports of any breakdowns although the cisterns had been in existence for relatively short periods. Users were very satisfied with the cisterns.

Details of the costs of cisterns were not provided in project documents, but they can be estimated. Total project expenditures within the cistern program were \$547,000 (cfa 197 million) for 61 cisterns (61 hangars with 4 cisterns each) or about \$9,000 (cfa 3 million) per cistern. If village contributions in labor and materials are monetized then an additional \$135,000 (cfa 49 million) would be added which brings the cost per cistern to \$11,000 (cfa 4 million).

Using the project cost of \$9,000 (cfa 3 million) per cistern which serves a population of 40 people, the construction cost is \$225 (cfa 81,000) per person. With average annual incomes in Togo of about \$294 (cfa 106,000), the cost of a cistern is clearly beyond the means of most Togolese should they be expected to bear the real construction costs. However, maintenance costs can be expected to be modest and fully within the villages' capacity. In consideration of the relatively high construction costs and the limited quantity of water made available per capita, it is the view of the evaluation team that increased efforts should be made to reduce cistern costs in order to improve acceptability of this alternative technology.

### 5.3.5 Impact

Similarly to drilled wells and springs, the impact of cisterns appears to be primarily in two domains. First, the time required for women to collect water has been reduced since the cisterns are very close to their homes. Cisterns are located usually fewer than 50 meters from users' homes while drilled wells and springs may be hundreds of meters from the majority of users. However, because of the limited daily quantity of water available, women still must travel frequently to the old source to augment their daily water needs. Thus the time saved by cisterns in obtaining water is comparatively less significant. Secondly, villagers indicated a strong opinion that guinea worm infections has been eliminated in the villages visited by the evaluation team and that diarrhea had been reduced. While one must be cautious in placing too much value in such assertions, the degree of assuredness expressed by the villagers was unusually strong.

Another impact of the hangars is that they provided shelter for meetings and other community activities. Several villages indicated their intent to begin schools under the hangars.

## 5.4 Latrines

### 5.4.1 Resources

Latrine construction was financed by USAID at a total cost of \$526,000 (cfa 189 million). Village contributions were estimated at an additional \$60,000 (cfa 22 million). These cover construction labor, materials, equipment, and support costs but do not include the costs of GOT agents.

### 5.4.2 Organization

The type of latrines constructed within the project are a "covered double pit" with wing walls to the bottom of the excavation. The pits are ventilated with PVC pipe and the latrines are enclosed with a small shed of cement block construction and a galvanized tin roof. The latrines were usually constructed in groups of one to six based on an estimate of 30 users per pit.

The double pit design is intended to allow one pit to be used, and after it is full, to switch to the other pit. Decomposition within the first pit over a year's time will allow the eventual safe removal of fecal matter and the continued use of the latrine indefinitely. The depth of the pits is three meters which is sufficient in volume to allow the use of one pit for about 16 months. This is based on 90 liters of excreta per user per year.

The dimensions of the latrines are minimal but adequate and keep construction costs low. Cement mixes were double that needed for some of the construction, and there would have been additional savings if less cement had been used.

Latrine siting criteria within the village included:

- safe distance away from water sources
- good ventilation
- easily accessible to the users but not close enough to be a nuisance.

The design of the latrines is simple and easily within the capabilities of local masons. The manuals created by the project describing latrine construction are considered well done and useful for future projects.

#### 5.4.3 Results

During the original project design, latrine construction was a major focus and of equal status with boreholes. For financial reasons the original objective of 10,660 latrines was reduced ultimately to 612. The project completed 473 latrines in total or about 77 percent of the objective. The difference was said to be due to slow administrative procedures related to personnel, finances, and supplies of materials. Also village laborers were less available than envisioned.

#### 5.4.4 Efficiency

The overall quality of construction was good, and the latrines appeared to be well used. Among the villagers interviewed, 100 percent indicated their exclusive use of the latrines. The high usage rate can be partially attributed to the design and location of the latrines which appealed to users.

The cost of the latrines were rather high. Using project costs alone, which totaled \$526,000 (cfa 190 million) for 473 latrines, the unit cost of a latrine was about \$1,100 (cfa 400,000). This amounts to \$37 (cfa 13,000) per capita. This is probably too high for villagers to bear on their own. Indeed, latrines were not observed anywhere but within the project zone.

Field visits by the evaluation team allowed the following observations:

- Drainage around the pits was not completed systematically to assure the evacuation of runoff water;
- The finished quality of latrines was good overall;
- The latrines were located close to the users' houses, usually less than 50 meters;

- The general absence of unsanitary indicators such as human excreta, strong odors, stagnant pools, garbage, cockroaches, and mosquitoes attested to the high use of the latrines;
- The life of the latrines is difficult to estimate because the project experience to date is less than two years.

#### 5.4.5 Impact

As stated in the previous section the high usage rate of latrines and the general cleanliness of the villages appeared to attest to an unusually high acceptance of the value of latrines. At least the latrines offer a convenience to the user and possibly an increased understanding of their role in disease prevention. The almost complete absence of human fecal matter in the vicinity of the village is a remarkable change that should reduce disease transmission. Other concrete evidence of the impact of latrines upon village health would be only speculation at this time since the latrines are relatively new.

The number of villages which participated in the latrine program was only about three percent of the total project villages. Obviously there are many villages which would benefit in the future from a latrine program.

## Chapter 6

### MAINTENANCE

#### 6.1 Pumps

##### 6.1.1 Resources

Funds for pump maintenance came from several sources. The assembly and installation of all pumps was financed by FAC. The GOT provided salaries for agents who worked within pump maintenance, and USAID provided transportation costs for these agents. The villagers provided labor and materials for apron construction and, most importantly, have purchased spare parts for pump repair.

The FED participated for about six years in setting up a GOT organization entitled Pump Maintenance Group (Structure d'entretien des pompes) whose role was to install and maintain all pumps in Togo. Since May 1985 this group was financed by the GOT.

At the beginning of the project the manufacturer of the Vergnet pumps provided a technician for about three months to supervise the installation of the initial shipment of pumps. The Pump Maintenance Group provided two teams of masons for apron construction, two mechanics for pump installation and village training, and six mechanics for pump repair. Training was provided to the village pump repairmen by the project as described in Chapter 3.

The GOT with FAC assistance had provided 708 Vergnet pumps by the time of this evaluation, and 340 more pumps of the UPM type were expected to arrive in Togo in December 1987. The Pump Maintenance Group used five vehicles in its operations.

##### 6.1.2 Organization

Pump maintenance was organized on a two-tier system. Within the village two pump repair persons had been trained to handle all of the basic repairs and replace used parts. At the regional level there were three mobile teams assigned to the two regions who were responsible for major repairs beyond the capabilities of the village repairmen. The regional mechanics were supposed to schedule periodic visits to villages and also respond to specific requests from villages for pump repairs.

Spare parts for the Vergnet pump were to be sold by commercial outlets of the general merchandise store of SGGG (Société Général du Golfe de Guinée). These stores are located in several larger towns within both regions. The cost of purchasing spare parts was to have been the responsibility of the villages. Some spare parts were guaranteed by the manufacturer for one to three years.

### 6.1.3 Results

A maintenance program has been established in every project village as a prerequisite for pump installation. The VDCs have organized finances for the specific purpose of pump maintenance and training has been provided to village pump repairmen and the women caretakers as described in Chapters 3 and 4. To date, many pumps have broken down and have been repaired by repairmen or the regional mechanics.

### 6.1.4 Efficiency

Several problems are evident in the pump maintenance system. The regional mechanics have not been able to respond to all of the repairs requested of them to date. Many pumps have been out of order for as long as four months. The frequency of repair of the hydraulic bladder (baudruche) has been greater than expected, and it is costly to replace (about \$244 or cfa 87,000). Although the manufacturer has guaranteed this part, it was not clear to the evaluation team how many of these parts have been replaced free of charge. Further, the SGGG has not always had needed spare parts nor are there a sufficient number of stores to allow easy access for all villages.

On the positive side, most of the pumps have been kept working without long delays if the repairs were within the capability of the village repairmen. During the evaluation team's visit, 20 percent of the pumps were not working. This figure is similar to other project surveys. Other studies, including the IRC (Dutch) in 1984, CINAM (French) in 1985, and Water Services (HER) in 1985, indicated 75 percent, 92 percent, and 81 percent respectively of pumps working within the project. These percentages were significantly higher than those for other projects in Togo.

In order to improve the maintenance program a three-tier system is recommended to be extended to the two project regions. Between the regional mechanics and the village repairman, a middle tier, an intervillage artisan, would assume much of the work that the regional mechanics are too understaffed to accomplish. This system has been agreed to by the GOT, and FED was to have helped finance the system. Delays in reaching agreements, however, have effectively suspended this arrangement for at least the coming year. The intervillage artisans would, in theory, be supervised by the regional mechanics and their services paid for by the VDCs. This system is already in use by CUSO in the maritime region of Togo.

The introduction of a new pump, the UPM, obviously introduces uncertainties and may be detrimental to the project. Little is known about the frequency and nature of repairs. New training will be required for village repairmen. On the positive side, the pump appears to offer some advantages, particularly in pumping capacity. However, the uncertainties outweigh the advantages, and it is most regrettable that this pump is being introduced at the end of the project. (NOTE: There was disagreement among evaluation team members as to the merits of introducing the UPM pump. The preceding paragraph may therefore be attributed as the opinion of the team leader alone.)

### 6.1.5 Impact

The impact of the pump maintenance program has largely been one of requiring the VDCs to operate on their own, to utilize the training they have received within the project, and to solve their own pump maintenance problems. They have demonstrated to themselves and the project that they are capable and probably have garnered confidence in attempting new activities. While this impact is somewhat intangible it is nonetheless an important one particularly if the VDCs do indeed undertake new projects.

## 6.2 Latrines

### 6.2.1 Resources

The resources made available for latrine maintenance came entirely from the villagers themselves. A latrine maintenance fund in the amount of \$14 (cfa 5,000) was collected by the VDCs. The VDCs have accepted responsibility and provided leadership, with advice from the public health field agents, in mobilizing the necessary village support. Material needs consisted to date primarily of cleaning materials. Of the villages visited by the evaluation team, all of the resources were available.

### 6.2.2 Organization

The organization established by the project for latrine maintenance consisted of the following:

- the latrine users have been given specific tasks to perform periodically
- a group of latrine caretakers, one for each latrine, is responsible for maintenance and supervision
- the VDC president is responsible for overseeing the latrine program within the village
- the public health agent provides overall advice and periodic inspections.

### 6.2.3 Results

Three activities were prescribed by the project in latrine maintenance:

- clean and deodorize the toilet chair
- burn paper and toilet materials
- remove weeds around the latrines.

These were to be done once a week and, according to the observations of the evaluation team, appeared to be done exceptionally well.

#### 6.2.4 Efficiency

The following were noted by the evaluation team:

- In 80 percent of the latrines observed there was no fecal matter on the latrine platform and no stagnant water, weeds, cockroaches, or flies.
- In 50 percent of the latrines there were no sulfur odors.
- One hundred percent of the latrines were in perfect structural condition.

#### 6.2.5 Impact

Similarly to pump maintenance, there appeared to be a confidence and pride within the village in the operation and maintenance of their latrines. The total usage of latrines by the villagers represents a significant change from their previous habits and was accomplished in a very short period of time.

### 6.3 Cisterns

#### 6.3.1 Resources

Cistern maintenance resources are essentially the same as those for latrine maintenance.

#### 6.3.2 Organization

Organization of cistern maintenance is also the same as that described for latrine maintenance.

#### 6.3.3 Results

Maintenance requirements prescribed by the project were as follows:

- Clean and disinfect the interior of the cisterns each season before the first rain.
- Keep the service hatch tightly closed, reset the diversion device after each rain, and verify that the system is operating before each rain.

- Keep weeds and debris from collecting near the hangar.
- Educate the users on operating the faucet.

#### 6.3.4 Efficiency

The evaluation team observed the following:

- The water stored in the cisterns was clear and odorless and the area around the hangars was free of human fecal matter in 100 percent of the cisterns observed.
- In more than 50 percent of sites, animal excreta and other trash were observed.
- There was 100 percent utilization by the intended beneficiaries.

It is recommended that chlorine bleach (eau de javel) be used in order to assure the disinfection of the cisterns. This is readily available to villagers but will require some training in its proper dosage.

#### 6.3.5 Impact

Water for cooking and consumption was obtained entirely from the cisterns at the total exclusion of water from old sources. This was done in spite of the fact that some water for other purposes such as bathing and washing was still being obtained from rivers and ponds. The acceptance of the cisterns as sources of clean water which reduces waterborne diseases was well established within the user group. The value of the cisterns was clearly established and the resulting need to maintain the systems was demonstrated by the villagers.

## Chapter 7

### WATER QUALITY

#### 7.1 Water Quality Analysis

Particular attention has been placed on water quality by the evaluation team, primarily as a result of a Water Quality Study and subsequent report undertaken by the project. The Water Quality Study was completed in April 1987 and reported that 41.5 percent of drilled wells tested were contaminated. Contamination was defined as any bacteriological count which exceeded the following:

- (1) total bacterial count = 500/ml;
- (2) total coliforms = 10/100 ml;
- (3) fecal coliforms, E. coli, fecal streptococci = 0.

WASH was asked to review the report, and in a letter dated 10 September 1987, written by Dennis Warner, it was suggested that the report could be viewed in several ways, thereby reaching somewhat different conclusions regarding corrective actions. Based on Warner's review and observations made by the evaluation team, several issues were raised related to water quality, including:

- (1) the number of boreholes contaminated;
- (2) the source of borehole contamination;
- (3) corrective actions for reducing borehole contamination;
- (4) household contamination;
- (5) water quality standards.

#### 7.2 Number of Wells Contaminated

There is some question as to the severity of the contamination problem. It would have been preferable if the study had focused only on the microbial quality of water that is harmful to humans rather than including total bacterial counts and total coliforms which may be elevated from naturally occurring non-fecal sources. The best indicator is fecal coliform counts which provides a more direct measure of organisms that have health implications to humans. When only fecal coliforms are used as a measure, it appears that the proportion of boreholes contaminated is only about one-half (20-22 percent) of the total shown in the Water Quality Study as having "contaminated" water (41.5 percent).

Further, the choice of borehole sites for the analysis was based on boreholes which were suspected of contamination. This suggests that a truly random sampling might also find an overall proportion of contaminated boreholes smaller than that indicated.

The report also noted that chemical water quality of boreholes is generally quite good. Some boreholes exceeded WHO standards in respect to nitrate, sulphate, chlorine, and iron but these are relatively minor.

It is not the intention of the comments indicated herein to suggest that there is no problem in regard to water quality. There is a serious problem that needs to be addressed with regard to bacteriological contamination of boreholes. The problem is, however, perhaps not as severe as was indicated in the water quality report.

### 7.3 Source of Borehole Contamination

Several possible sources of contamination exist. Since the number of sources containing fecal streptococci was unusually high, this suggests that fecal contamination is largely of animal origin (cows, pigs, chickens, etc.). Animals were observed around all boreholes, and in several cases holes had been dug or watering troughs constructed specifically for animals. In all cases the watering places for animals were less than five meters from the borehole apron.

Several boreholes were observed to have flat surfaces near the borehole which tended to collect drainage water from the pump or rainwater. Runoff from rains would potentially collect contaminants, particularly from animals, and allow the contaminants to enter the groundwater near the borehole. Properly constructed boreholes should withstand such conditions except under unusual geologic conditions.

To further compound the problem, it was observed that at many boreholes aprons were constructed at ground level. Stagnant water tended to collect at the edge of the apron. Ideally, there should be a slope away from the borehole.

Another potential source of pollution is pump repairs. The Vergnet pump is designed to facilitate easy removal of the drop tube. This tube is normally laid on the ground next to the borehole during repairs. Obviously, contaminants can be introduced directly during such repairs.

### 7.4 Actions to Correct Borehole Contamination

To eliminate or reduce the occurrence of borehole contamination the following steps are recommended:

- Chemically treat all boreholes which tested positive for fecal organisms. At the same time correct any design or construction faults in the borehole.

- Make it perfectly clear to all repairmen, at village and regional levels, that the boreholes must be disinfected whenever they are opened for repair.
- Underline the need for the VDCs to provide proper drainage around their boreholes.
- Recommend that the VDCs construct a fence 15 meters from the boreholes.

#### 7.5 Household Contamination

It was stated in the water quality report that contamination of water in household containers was more frequent on the average than contamination of the water source. This indicates that the pollution was introduced between the water point and the home or in the home itself. The evaluation team also observed conditions and practices in about 50 percent of homes which would allow contamination of water supplies. While almost all homes had covered water jars, some did not use a separate and clean vessel for dipping water from the jars. Almost all of the villagers knew, from the project campaigns on health, the proper methods for keeping their supplies clean but only half actually practiced these techniques. Continued reinforcement of the health messages developed by the project will be needed in the future.

#### 7.6 Water Quality Standards

As expressed in Warner's letter regarding the water quality report, the guidelines are more rigorous than necessary for health reasons alone. While it may be desirable to have no enteric organisms in water supplies, it is not unusual for untreated supplies to have some fecal organisms and still not pose significant risks to health. Realistic water quality standards should take into consideration costs, available resources, and alternatives for water supply. Several countries have adopted provisional guidelines which are more liberal than WHO standards but which stipulate concrete actions to address a range of bacteriological conditions.

It is understood that the GOT will soon convene a panel to address water quality standards for Togo. It is recommended that the issues raised herein be included in that panel's deliberations.

## Chapter 8

### LESSONS LEARNED

Lessons learned from project experiences are invaluable for the effective planning and implementation of future projects. The Togo Rural Water Supply and Sanitation Project has offered many significant lessons learned that should be of interest not only to Togo but to other countries who wish to improve rural health through water supply, sanitation, and health education.

1. Sustainability should be the ultimate objective of a project in the sense that effective activities and structures completed or begun within a project will be continued, maintained, and replicated in the future. Sustainability depends, therefore, on the existence of institutions staffed with qualified personnel who will continue to move forward after the project is completed. This project placed considerable emphasis on the institutional development of the GOT social affairs agencies and on Village Development Committees. This emphasis was the key to overall project success.
2. Building upon an existing governmental organization with its organizational structure, personnel, and administrative regulations is preferable to creating new organizations. The use of the agencies of Social Affairs Services, Health Education and Sanitation, Water Services (Service des Affaires Sociales, Service d'Assainissement et d'Education pour la Santé, et Service Hydraulique) as the vehicles of project implementation insures that project activities will be continued in the future. Other projects, both in Togo and elsewhere, have sometimes created entirely new structures outside of the government or instituted policy reforms such as salary enhancements which are destined to end at the completion of the project.
3. Community development requires an on-going relationship between the village and the project in defining problems, solutions, and approaches to development. The village should be involved in decisions in which it is expected to participate. Frequent communication is needed over relatively long periods of time. This project provided guidance and training to many project villages over a seven-year period. On average, each field agent spent the equivalent of one year's time per village in establishing committees, supervising activities, and assuring follow-up activities over the life of the project. Such large commitments of time allocated to village contacts are necessary to assure effective community development.
4. Project resources devoted to community development and health education need to be substantially more than previously expended in similar water projects. About one-fourth of financial resources expended within this project were devoted to community development activities, a figure which appears close to a desirable norm for rural water projects in general.

5. The contracting of drilling services to the private sector offers significant savings in time and money over comparable government sector operations. This presumes that there is a sufficient number of firms within the private sector to allow competitive bidding.
6. The concept of village responsibility for pump maintenance is viable and should be continued. However, in order for villages to be truly responsible, they need to have all resources including spare parts, tools, and training within their grasp. Problems develop because of factors outside village control such as insufficient regional repair teams, unexpectedly expensive breakdowns, or unavailability of spare parts at designated stores. Villages have demonstrated a willingness to pay for maintenance costs within reason.
7. Planning should be based on a critical path to insure that needed resources (material, financial, personnel) are available at the required times. For example, drilling should not begin until village development committees are formed, ncr should it begin before pumps are available for installation.
8. Training and extension work based on participatory techniques should be used at every level. While a significant amount of resources are needed to undertake such training the results justify the approach. Training of trainers should be emphasized.
9. Women are a key component of any rural water and health project, and women should be involved in all phases of project activities.
10. It should be expected that follow-on activities will result from community development beyond the original objectives of a water project. It would be desirable to allocate some project resources for micro-projects, possibly outside the water and health sector, which would serve to encourage village committees to continue developing their own potential.
11. Cisterns and springs, as alternatives to boreholes, offer real advantages that need to be considered in water projects. Both springs and cisterns have lower construction and maintenance cost requirements and they are not dependent on a pumping system. Cisterns have the further advantage that they may be built in areas where boreholes are not feasible because of a lack of groundwater.
12. In order to obtain maximum health benefits a project should utilize a combination of interventions. Water supply, health education, latrines, and ORT were combined in this project and the results can be potentially expected to be compounded rather than additive in regard to potential impacts. Real impacts in health, social, economic, and environmental domains should only be expected, however, at the completion of such a project, or later.

## Chapter 9

### CONCLUSIONS AND RECOMMENDATIONS

The project fulfilled or exceeded its overall objectives. The participants deserve praise for their expertise and their commitment to the goals of the project. Most importantly, the Village Development Committees seem to be well established, capable, and understanding of their role in health improvement. They have demonstrated their commitment to maintaining water supply structures and latrines and seem willing to undertake more development activities.

#### 9.1 Administration

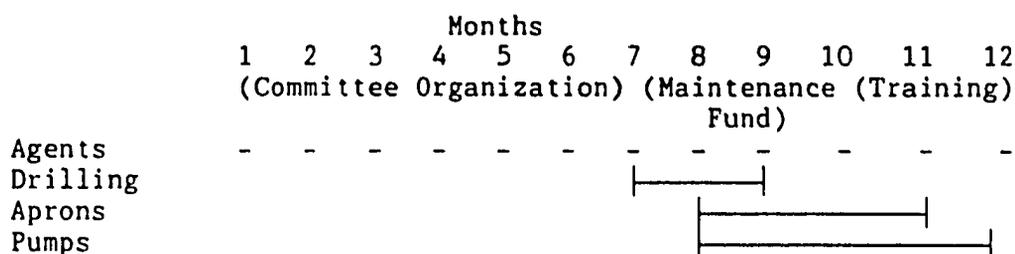
##### 9.1.1 Conclusions

1. Improvements were made in the project relevant to the administration and management since the mid-term evaluation.
2. Given the complex organizational structure of the project with several donors and GOT agencies involved, it is not surprising that project coordination faced difficulties. For example, the long delay in installing permanent pumps on existing boreholes could have been avoided or quickly solved with better coordination.
3. Contracting with the private sector for hydrogeologic studies and well-drilling was successful and offered the Government of Togo an advantageous price for the operations. The cost of wells in Burkina Faso was \$11,211 (cfa 4.215 million) per well, in contrast to \$8,000 per well in this project, a 32 percent savings.
4. In certain cases agents were overworked because of the number of villages for which they were responsible. The approximate number of villages to be covered per agent is subject to time and distance. It is suggested that, if the villages are grouped within a 15 kilometer radius, the agent could then take care of approximately 20 villages. Within a radius of 30 kilometers, a maximum of ten villages is desirable.

9.1.2 Recommendations

1. In planning and coordinating the tasks of the health agents with borehole construction activities, the following standards are recommended as general guidelines:

| <u>Inputs</u>            | <u>Time Required</u> | <u>Outputs</u> |
|--------------------------|----------------------|----------------|
| 100 agents               | 1 year               | 100 committees |
| 1 apron team             | 5 months             | 100 aprons     |
| 1 pump installation team | 4 months             | 100 pumps      |
| 1 drilling team          | 3 months             | 100 drillings  |



2. Every possible effort should be made to accelerate the installation of pumps in the 340 wells that are not yet equipped. The training of local repairmen on the new UPM pump models should also be undertaken.
3. In order to consolidate the work of existing committees, those in charge of both the Affaires Sociales and the Service Hydraulique should program a considerable portion of their agent's time (approximately 10 to 25 percent) to assist the committees in continuing the tasks in the future.
4. The USAID Child Survival Project should consider the possibility of using its remaining balance of \$750,000 to continue the socio-sanitation component of this project. It is evident that some villages that have participated in the project still need assistance (additional wells, cisterns, or latrines, for example) in order to reach the goals proposed in the Child Survival strategies. The integration of water supply improvement and latrine construction with ORT and vaccinations would be an important conceptual approach in the planning of Child Survival programs.
5. The USAID Child Survival Project should, as much as possible, utilize the experienced staff employed by the Rural Water Supply and Sanitation Project, in particular, the accounting and secretarial staff with their knowledge of existing managerial systems. They would be extremely valuable to the new project.

## 9.2 Training

### 9.2.1 Conclusions

1. The community organizing and training component was an essential part of the village water supply project. Without this component, the impact of the project would have been greatly reduced in the short run but more so in the long run.
2. It is commendable that the project was undertaken in close collaboration with the Department of Health Education and Sanitation of the Ministry of Public Health. The project's contributions reinforced the skills and capacity of the ministry to carry out rural development. An important contribution of the project was transportation which greatly helped the agents cover the villages on a continuing basis.
3. Village water projects tend to fall into two categories: those that are done without the people's participation and those that are done with it. It is evident that this project was undertaken with the participation of the people. The primary goal of the training-extension component was to engender village participation at every stage of planning, financing, construction, management and maintenance of water supply and sanitation technologies. The strategy used in this project to cover the population was very well thought through and, in most cases, effective when the agents were motivated and watchful.
4. The success of the project's training and extension activities is due in great measure to the participatory methodology which was used at every level. In view of the results, we believe that the human resources and the time required for this approach to training are justified. During the seven-year life of the project about 120 field agents received 160 days of training each. The role of the Technical Assistants in setting up the participatory-based training programs was particularly important.
5. During the course of the project selected agents of the two services were involved in a timely fashion in the preparation of training programs and seminar animation. We believe, however, that the project did not do as much as possible to establish a core of several agents who have had the opportunity to improve knowledge and skills in all aspects of conceptualization, elaboration, management, and evaluation of training programs.

## 9.2.2 Recommendations

1. It is recommended to the Department of Health Education and Sanitation that a follow-up group be made of committees and village volunteers who are already trained, and that these persons be "recycled" (receive refresher training) once every year.
2. It is recommended to the Regional Headquarters of Social Welfare that the agents of the two services be "recycled" periodically in terms of technical ability, as well as methods of community development.
3. Based on the project's experience in the training of female ORT officials, it is recommended to the Child Survival Project that a similar procedure be used for public health education activities by village women. There are several reservations to this approach, however. Concerning the choice of female volunteers, it would seem preferable to use different female leaders for different activities (for example, RVO, guinea worm, vaccinations, nutrition), instead of using the same women for several activities. With regard to the content of the training of female leaders, it is important that it include technical aspects of the sanitary problem in question, but equally important are the ideas and practice of adult pedagogy. Concerning the leaders who are already trained, it is very important that follow-up visits be made by field agents at least once a month, and preferably more often than that.
4. In every village water project special importance should be given to organizing and providing services for the entire population and that the advice of these beneficiaries be taken into consideration. The population must understand, as much as possible, the new technology, and its participation must be definite. Some villages must be trained in order to make sure of timely and effective water supply maintenance and repairs.
5. It is desirable in a village water project to have good coordination between the technical and the community participation components. It is preferable that the village organization phase be finished before beginning the construction phase.

## 9.3 Community Development

### 9.3.1 Conclusions

1. The strategy which was used to involve the community included organizing meetings at the village level, training workshops for villagers from a group of adjacent villages, follow-up and evaluation of the community activities in the villages. This

process required careful follow-up by the field agents for several years. The community organizing and training strategy used in the project was very well planned out in advance and in the majority of cases, where the field agents were motivated and persistent, was very effective. It is believed that the careful organization, training, and follow-up of community members is necessary in a rural water supply project if one seeks to assure coherent and sustained community participation.

2. The project has met with great success in community development but much still remains to be done. Of first priority is the provision of pumps for the remaining 340 boreholes. The activities begun by the project should be continued in collaboration with the GOT Community Development Division.
3. In some cases single agents were found to be responsible for as many as 31 villages. This was excessive and did not allow proper supervision in spite of the agents' strong efforts.
4. The participation of women in the project was not as high as could be expected. There were 5,439 women pump caretakers and ORT demonstrators. Many other women have doubtlessly benefited from the project but there has been no count made of actual numbers. Data was not available.
5. With illiteracy rates of 90 percent in rural villages, literacy programs deserve further attention. The problem was most evident in regard to understanding the project contracts and keeping village bank accounts. The project established 11 literacy centers but this was hardly sufficient to serve the 864 project villages.
6. The collaboration begun with the Community Development Division at the national level and the association of this Division in the design and implementation of the project should have been continued to the end of the project.

#### 9.3.2 Recommendations (for future projects of a similar nature)

1. Training should be given to VDCs in areas of health other than waterborne diseases. The VDCs have been well established and offer an excellent vehicle to expand health knowledge throughout the population.
2. Quantifiable objectives should be established for the integration of women into future projects.
3. At the national level, the Department of Women's Welfare (Direction Générale de la Condition Féminine) should be integrated at all levels of the project's elaboration and execution in order to address problems of women and jointly define the objectives and programs of the project.

4. At the regional level, more training should be provided to help agents better understand women's issues. Regional Coordinators should become more involved in defining women's roles in programs.
5. At the local level, efforts to involve women in project activities should be reinforced. Women need to be involved in micro-projects including marketing, agriculture, raising livestock, artisan transformation, management of mills, and literacy centers. Such integration is the only means of allowing women to assume greater responsibility for their affairs.
6. The water needs of the population within the project zone have not been entirely fulfilled. New water projects are needed.

#### 9.4 Boreholes and Springs

##### 9.4.1 Conclusions

1. With regard to boreholes, the quality of water produced by the wells has apparently resulted in the reduction of some waterborne diseases. The quality of this water may be diminished by the storage methods used by the village women. It can also be degraded during pump repairs.
2. This project permitted a better understanding of groundwater resources and added to the hydrogeologic data bank.
3. The number of pumps per mechanic was excessive and didn't allow a rapid response to breakdowns. It appears that under the current system more than 75 pumps are assigned to each regional mechanic.
4. All the productive boreholes of the project have not yet been equipped. This delay is due to the time lapse between the calls for bids, to a technical and regulatory decision made in the choice of pumps, and to constraints from certain donors.
5. With regard to spring improvement, the low-water flow of springs was not sufficiently determined before construction. Further studies would be helpful to locate springs which could benefit certain villages within the project zone.

##### 9.4.2 Recommendations

1. Villagers need to be made more aware of hygienic methods of storing water. In the future, wells should be disinfected after installation and after each repair.

2. Water Services should develop a strategy to determine when to substitute alternative technologies for boreholes. Zones without groundwater should be delineated, and a systematic search for the most productive alternative should be begun.
3. Water Services should extend a three-stage maintenance system for pump upkeep to the project zone. In choosing pumps, DHE should stress capacity and reduced maintenance costs.
4. To avoid delays in pump installation, it will be necessary to call for bids for pumps at the same time as bids for drilling operations. For the present all efforts must be made to accelerate the installation of 340 remaining pumps and to set up the training of village repairmen.
5. A preliminary study of low-water flows (one to two years) should be made in order to choose for improvement springs with considerable flow. One may eventually envisage gravity-fed piped water systems, which would supply water to large villages far from the source. To this end, it is recommended that funds be provided for studies of all springs to determine their suitability for development and for piped distribution systems.

## 9.5 Latrines and Cisterns

### 9.5.1 Conclusions

#### Latrines

1. The type of latrine built by the project collects and isolates human excrement under hygienic conditions that are very acceptable to the environment of the beneficiary villages. Its utilization leads to health-giving behavior. The double pit system will allow a long latrine life. Its cost, however, remains beyond the financial means of rural people.
2. Resources mobilized for latrine construction have been considerable but insufficient. Only about three percent of project villages received latrines. The very favorable impact of latrine use will probably be less noticeable at the level of non-recipient villages, thus reducing the possibility of seeing these villages take the responsibility of starting their own latrine construction programs.
3. The organizational set-up for latrine maintenance is simple yet effective, given that the tasks are already established within the framework of local habits. Mobilizing each user leads to individual awareness of his/her role in the improvement of the community.

## Cisterns

1. The cistern/rooftop catchment system that was completed is, on the whole, well adapted to the rural environment and effective in the storage of clean water. The quality of the finished system is such that it may serve as a model for village development technologies. Nevertheless, the concept and method of cistern construction as well as the cost are well above local skills and financial means.
2. The resources mobilized for cistern construction are considerable but insufficient. The number of cisterns finished is clearly insufficient in satisfying all priority needs.
3. The organization for cistern maintenance is simple and villagers are well aware of its role.

### 9.5.2 Recommendations

1. Future projects should always begin with a background study to determine available resources and skills in order to utilize this data in the planning phase.
2. Given the low income of rural people and the rarity of specialized handiwork, the design and construction methods for latrine trenches and cisterns need to be revised and construction manuals changed accordingly.
3. In order to guarantee the quality of water stored in cisterns, supplementary training should be given to all beneficiaries on disinfection with bleach. At the same time latrine, rooftop catchment, and cistern maintenance should be reviewed.

## 9.6 Water Quality

### 9.6.1 Conclusions

1. Observations in the villages that were visited and the water analysis report call into question the effectiveness of measures to protect wells against pollution.
2. According to the project agreement, the GOT is in charge of the quality of the water at the project's completed water supply sites. Water quality will not receive the attention due it until the next phase of the national water supply program.

### 9.6.2 Recommendations

1. In order to drastically reduce the contamination of wells from drainage and animal wastes, it is imperative that drainage be improved around the boreholes by constructing channels which carry excess water at least 15 meters away from the borehole.
2. In order to neutralize pollution of boreholes during maintenance and repairs, it is necessary to prescribe a systematic disinfection of all pieces and parts of new pumps, replaced or maintained before their installation, and the water itself before pump priming.
3. In order to verify and insure the effectiveness of measures to protect of water points, it will be necessary to equip the Services Régionaux d'Assainissement with small water quality analysis control laboratories for each region and to develop standards adapted to Togo to serve as a basis for assessment.

**PHOTOGRAPHS**  
**PHOTOGRAPHIES**



Photo 1

Woman using Vergnet foot pump to obtain water for her family's household use.

Femme en train d'employer la pompe à pied Vergnet pour les besoins ménagers de sa famille.



Photo 2

Water demand is high around certain wells for both humans and animals. It is recommended that fences and watering troughs be constructed around such wells.

La demande de l'eau est élevée auprès des puits particuliers pour les humains et les animaux tous les deux. Il est conseillé de construire des clôtures et des abreuvoirs près de tels puits.



Photo 3 In zones without groundwater, cisterns and hangars were constructed.

Dans les zones sans eaux souterraines, on a construit des citernes et des hangars.



Photo 4 In some cases existing roofs were utilized to channel water to a set of cisterns.

On a utilisé parfois des toits existants pour canaliser de l'eau vers des citernes.



Photo 5

Cistern work required a series of construction steps and skilled workers.

Les travaux de citernes ont nécessité une série des escales de construction et des ouvriers bien formés.

Photo 6

Cistern design included an automatic diversion system to avoid the first flush of rainwater.

Le dessin de citerne a compris un système automatique de dérivation pour éviter la première chasse d'eau pluviale.





Photo 7 Latrines were a double-pit VIP design.

Les latrines étaient améliorées à double fosse autoventilée.



Photo 8 For larger villages, multiple latrines were constructed, with each latrine designed to accommodate 30 users.

Pour les villages plus grands, on a construit des multiples latrines; chaque latrine ayant été dessinée à recevoir une trentaine d'usagers.



Photo 9

Adult literacy campaigns were instituted by the project in response to village needs.

Des campagnes d'alphabétisation ont été insituées par le projet en réponse aux besoins du village.



Photo 10 The key to much project success was the close collaboration between GOT field agents and Village Development Committees.

La clé à beaucoup de succès était la collaboration étroite entre les représentants régionaux du gouvernement togolais et les Comités villageois de développement.

**APPENDIX A**

**References**

## Appendix A

### REFERENCES

#### Documents du projet

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**APPENDIX B**

**Persons Contacted**

APPENDIX B

Persons Contacted

NIVEAU INTERNATIONAL

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- M. MADJOME, Superviseur régional du projet
- M. ADODO, Superviseur régional d'alphabétisation (co-formateur)

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- M. ISSAKA, Directeur régional d'assainissement
- M. FOLLY, Chef de subdivision d'hydraulique
- M. KASSIME, Superviseur régional du projet
- M. LACKYI, Superviseur régional d'alphabétisation
- M. AKOH, Chef, Secteur social de l'Oti

APPENDIX C

List of Villages Visited

APPENDIX C

List of Villages Visited

SAVANNES

Loko

Barkoissi

Kantindi

Namound Joga

PLATEAUX

Kougnohou

Kpalave

Datcha Tsogli

Axolé