

TOGO RURAL WATER
PROJECT PAPER AMENDMENTOFFICIAL PROJECT
DOCUMENT

693-0210

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Executive Summary

The purpose of this project paper amendment is to provide justification for a three year extension of the project activity completion date to September 9, 1987 and an increase in life of project funding of \$3.9 million. Project goal and purpose remain essentially unchanged. The necessary changes in input levels and the corresponding output revisions are described in this document.

The amendment basically extends and only slightly modifies a project determined to be functioning well by a mid-term evaluation team in April 1983. The drilling of wells in the two project regions of Plateau and Savanes will continue for an additional two years. The complementary health/sanitation component will continue its health education training and focus increasingly on village level participation in the micro-project development program, which has latrine construction as a major component.

The Togo Rural Water project constitutes the cornerstone of the U.S. development program in Togo. This project paper amendment responds to requests by government of Togo (GOT) officials for project continuation. The project directly responds to the national priority of providing potable water and improved sanitation to rural villagers as defined in the GOT Third National Development Plan.

This document should be read in conjunction with the Mid-term (Annex III) Evaluation report. The detailed specific analyses in that report provided much of the rationale for extension of the project.

A. Project Summary

1. Project Description

The Togo Rural Water and Sanitation Project responds to the crucial need for water described in the Government of Togo's (GOT) Third National Development Plan for 1976-1980. The project began in 1980. The objective of the project is to provide potable water to 245,000 rural poor through the drilling of tubewells in about 350 villages. The corresponding health and sanitation component emphasizes the training of Ministry of Health social promotion agents and organizing village health committees to address health/sanitation concerns.

The project's well drilling component accounts for about 60% of total project funds. To date over 400 positive wells have been drilled. Due to the increased value of the dollar during 1982-1983 and better than anticipated economies of scale in drilling operations, drilling funds presently available will be sufficient for about 250 to 300 additional positive wells. In anticipation of this favorable situation the Project Authorization was amended by OAR/Lome with REDSO/WCA concurrence on April 15, 1983. The Project Authorization Amendment increased the number of authorized installed tubewells from 400 to 700. At the current drilling rate up to 700 positive wells should be completed by September 1984.

The drilling activity involves effective multi-donor cooperation. Pump purchase and installation is contributed by the French Fonds d'Aide et de Cooperation (FAC). The Fonds Europeen de Developpement (FED) provides pump maintenance and finances the technical services of the Bureau de Recherches Geologiques et Minieres (BRGM). In addition to AID's contribution the U.S. government provides the expertise of Peace Corps volunteers. The Toglese contribution consists primarily of the services of about 100 agents from the Ministry of Health and buildings for offices, office furnishings, etc.

The health and sanitation education component is designed as a logical complement to the well drilling component, to ensure proper utilization of water provided by the wells. Its objectives are to teach and promote village health, hygiene and sanitation in project villages. The training of agents emphasizes identification and resolution of health-related problems and organization of villagers into health committees. The goals of village health committees include: the mobilization of villagers, including devising systems for village financial support of well maintenance; education of villagers on proper water utilization and hygiene practices; training villagers in planning and implementation of village level micro-projects. Working with the social promotion agents, villagers will implement these projects with partial funding by AID. The planning process is well underway in the Plateau region.

The primary responsibility for implementation of the health and sanitation component of the project rests with the Ministry of Public Health and Social Affairs assisted by the two health education specialists on Personal Services Contracts to USAID. Although both PSCs travel frequently to both project regions (Plateau and Savannes), one specialist resides in Lome to function as a liaison with national level project management and the other resides in the Plateau region.

2. Input Status:

Total Funds obligated for the project are \$7,839,000, of which \$2,889,000 is for the health and sanitation component. A summary of obligations by input is in the Financial Annex.

a) Technical Assistance - The project paper envisaged 30 person months of technical assistance by two health education specialists. This was increased to 60 person months in Project Grant Agreement Amendment Six. To date 36 months of T.A. have been provided and 60 will be attained by the current PACD of Sept. 30, 1984.

The health education specialists are on Personal Services Contracts to USAID. The total costs of this T.A. is about \$90,000 per year per specialist (see Financial Annex detail). The specialist stationed in Lome functions as a counterpart to the National Coordinator. The position's primary duties include: assist in the revision of the timetable of project activities in the Plateau and Savanes regions to reflect the constraints of project implementation, assist in long-term project planning with AID and GOT personnel, prepare training materials and lay the groundwork for adequate administrative and commodity control of micro-project activities. The second health education specialist resides in the Plateau region and has more field-oriented responsibilities. This entails working closely with agents, Peace Corps volunteers and regional project officials.

b) Training - Four Togolese were sent on short-term training, three to the U.S. and one to a third country. Most of the \$250,000 budgeted for training in the project paper is for in-country training of social affairs and sanitation agents and their regional supervisors.

The agent training program has been adapted to the needs of each level of participants and reflects the evolution of health/sanitation component activities. Initial training encounters involved discussions of project objectives and activities, establishment of agent teams and village health committees, project administration and methodology. Further courses emphasize planning techniques, health education techniques and identification of problems that impact on sanitation and health. As the project moves toward commencement of micro-project activities training is increasingly oriented toward administrative organization.

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All social affairs agents are graduates of the national school of social work. In addition to the training objectives described above, some agents are taught to train field agents. Training usually involves frequent seminars of 3 to 5 days. Seminars sometimes address technical issues such as pump maintenance and special topics when problems arise in the project. Project training methods also emphasize communication techniques, conflict resolution in villages, group dynamics and project planning.

c) Commodities (excluding vehicles) - Expenditures for commodities total \$34,000 to date. This includes major office equipment and several small item purchases.

d) Vehicles - The project has purchased 4 cars, 4 pick-up trucks, 3 large trucks and 85 motorcycles. Most vehicles will need to be replaced during the proposed project extension. Vehicle costs to date total \$253,000.

e) Salaries and Operational costs - This includes per diem and gasoline costs for agents, small office supplies and salaries for some drivers, the project accountant and some manual laborers. (All agents' salaries are financed by the Ministry of Health)

f) Drilling - The drilling component totalling \$4,950,000 is entirely budgeted for a host country contract with the drilling company. A two-year contract was signed in September 1981, with drilling beginning shortly thereafter. A one-year contract extension is currently being processed, requiring no increase in the total budgeted amount.

Utilizing the technical services of BRGM, the well drilling company began drilling up to 400 successful wells, which have 100 mm PVC, screens and casing. Each well is fitted with a foot-operated pump. It was originally assumed that in order to obtain 400 positive wells it would be necessary to drill as many as 535 bores at an average depth of 45 meters. This projection allowed for a 27 percent failure rate. The actual result from 19 months of drilling have produced 622 boreholes at an average depth of 51 meters with a 36% failure rate. The drilling of bores was done at a rate of 25 per month. This rapid rate was achieved by using two drilling rigs. The company provided all required equipment as well as transportation and lodging for its personnel.

The contract was awarded competitively to a U.S. firm. However invitations for bids were extended not only to U.S. firms but also to the drilling companies established and/or operating in West Africa. A waiver was granted in order to permit this bidding arrangement.

g) Other Inputs

Peace Corps: There have been five Peace Corps volunteers in the Plateau region for over two years and four in the Savanes region for about a year. As volunteers complete their service they are replaced, maintaining a constant volunteer input level. The volunteers are mostly generalists in academic background who have received some specialized training by Peace Corps and the project in areas which will be most applicable to micro-projects. Generally there is one volunteer in each prefecture who functions as an advisor or counterpart to agents and chefs-secteurs (supervisors).

FAC: The French Fonds d'Aide et de Cooperation has contributed 400 Vergnet pumps and spare parts to date, and has placed orders for 300 more. During discussions with them in the past months they have stated their intention to continue to work with AID in this project, and have begun their formal process to obtain another additional 300 pumps and parts, which when obtained will make 1,000 pumps provided by them to the project.

FED: The Fonds Europeen de Developpement has financed the hydro-geological technical services of BRGM as well as the pump maintenance program. They have also indicated their intention to continue to provide these services for LOP, and have begun the formal procedures process.

GOT: The Government of Togo (recently added to the LDC list) has provided over 100 agents, senior management personnel, logistical support staff, office facilities and furnishings and housing for the Peace Corps volunteers. As the project continues they will increase their personnel inputs to the project at high technical level, field agent level and support staff.

3. Pipeline Review

The table on the following page summarizes the project pipeline as of 9/30/83. The major part of the pipeline is \$1,465,000 for drilling operations. At the present rate of drilling this amount will be sufficient to continue drilling until current PACD (9/30/84). At that time there will not be any pipeline related to the drilling component. As explained in the Revised Inputs/Outputs section of this document, additional funds for drilling must be authorized at this time if a disruption in drilling is to be avoided in September 1984 and to permit sufficient time for new drilling contract negotiations to be concluded.

The cost of each U.S. technical advisors is \$90,000 per year (see Financial Annex II). Thus by PACD about 90% of these funds will have been disbursed. The micro-project SOB budget is to be reduced by 60%

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(see new LOP budget in Financial Summary Section) so this present pipeline amount will be rebudgeted to inputs requiring additional funds. Commodity purchases and training have been behind schedule. However recent equipment orders and currently scheduled training courses will necessitate using many of these funds in the next year. There will be training funds available to continue planned activities well beyond current PACD since training began later than planned in the project. About half of the remaining funds in salaries and operational costs will be used during the next 12 months at the present rate of expenditures. The evaluation funds are available because the mid-term evaluation team was entirely U.S. direct hire staff and therefore not project funded. These funds will be needed during the next evaluation. Since contingency/inflation expenditures have been low the proposed PP amendment budget uses a modest estimate for this potential expense.

Project Pipeline
(in thousands)

	Present LOP Budget	Expenditures 9/30/83	Pipeline 9/30/83
TA	500	242	258
Training	245	44	201
Drilling	4,950	3,485	1,465
Micro-projects	950	-	950
Commodities	225	34	191
Vehicles	220	253	(33)
Salaries/Operational Costs	215	155	60
Evaluations	50	-	50
Contingency/Inflation	<u>484</u>	<u>11</u>	<u>473</u>
	<u>7,839</u>	<u>4,224</u>	<u>3,615</u>

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B. Mid-term Evaluation Report Summary

In March 1983 an extensive project evaluation was conducted as mandated in the project authorization. A team of five outside specialists worked closely with OAR/Lome, project staff and GOT personnel. The evaluation was corrective in nature, yielding 16 major recommendations. The overall findings were very positive. Much of the technical justification for this project paper amendment can be found in the detailed economic, management, social, health and engineering analyses of the evaluation. The following discussion of the evaluation report is intended only as a brief summary of those aspects of the evaluation report most related to the specific issues involved in extending the project another three years. Readers are encouraged to review the evaluation document itself and consider it to be in effect an annex to this project paper amendment.

The evaluation team concluded that training of agents was both thorough and effective. The training program's continuity and appropriateness to basic health concerns were strongly praised.

Village level health committees were found to be functioning well. As these committees become increasingly involved in the development of micro-projects, which includes latrines, there is a need for training in organizational skills and simple financial control procedures. The committees must not be involved solely in the latrine construction program. Further training of the committees in health and hygiene must not be neglected. This will include addressing health priorities such as malarial control, diarrhea control, prevention of dehydration and Guinea worm control.

Even though women are primary beneficiaries in the project, their participation as agents and village health committee members needs to be expanded. The training activities will continue to remind agents of the importance of ensuring women's active participation in committees and other activities. In the Savane where health committee organization is less advanced than the Plateau, agents are being actively encouraged to include more women. The key role played by women in village life is obvious and will be instrumental in reinforcing improved hygiene and health practices. Some health education activities such as nutritional weight monitoring, oral rehydration and child care will be directed primarily at women.

A key complement to the training activities mentioned is the expansion of the educational campaign component. There are many problems in designing educational materials for non-literate populations. The skills of an expert in educational materials development will be helpful. The appropriate techniques and educational materials are being carefully studied before being produced in quantity.

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The project improves income distribution because the water is targeted to Togo's most disadvantaged group - the rural poor. For years, Togo's resources have been drawn from its rural interior to build up a basically urban infrastructure. The development of Lome has been paid for largely by increased taxes levied on rural areas. This project represents a transfer of resources back to where much of the urban development was financed - the rural villages. The poor get a larger share of the country's resources than would otherwise be the case. This leads to a more equitable distribution of income in addition to reinvestment in Togo's main economic base - the agricultural sector.

Costs of maintaining families in urban areas is higher than in rural areas. Water shortages can be a major factor forcing urban migration. Higher social costs of maintaining urban families and agricultural production losses incurred when farm families are not engaged in productive rural activities (and are part of the urban unemployed or under-employed) can represent a significant economic loss to Togo.

Ideally, decisions for investing in rural water supply systems should be based on rigorous benefit/cost analyses in which both benefits and costs are quantified. After considerable research no completely satisfactory method has been developed for quantifying the benefits of improved water supply. World Health Organization (WHO) experts feel strongly, however, that safe water is essential for good health and a prerequisite to the control of most diseases affecting the rural areas. The number of diseases is generally greater than in urban settings. Examples are useful in illustrating the potential economic ramifications of increased potable water for the Togolese rural poor. In some cases conservative estimates for the benefit stream can still strongly support funding a project. This is the case for extending the Togo Rural Water and Sanitation Program. (See Benefit-Cost Analysis in the Evaluation Report.)

The economic impact of water through improved health in Togo depends on the success of removing or lessening water-related diseases. Guinea worm is a major health problem in Togo and is a debilitating disease affecting primarily the economically active segment of the population. The combination of potable water and health education is the most effective means of control. The heavy burden of other water-related parasitic diseases further reduces productivity. Breaking the chain of transmission of many of these diseases requires improved excreta disposal and hygiene. Public health education is vital to the achievement of full health benefits of improved water systems.

Time savings alone justifies project funding. Women save at least two hours per day fetching water. Assume conservatively 60 women beneficiaries per well. This is probably a low estimate for women and

certainly excludes the substantial effort of children in the villages. Each village then saves daily 120 hours (i.e., 60 women times 2 hours per day) or 10 full 12-hour work days. If women's work is valued at \$0.50 per day and women carry water once a day for 300 days of the year, an estimate of annual savings from just fetching water is \$1,500. At a 10 percent discount rate, the present value of savings from fetching water alone is \$15,000. This component of the benefit stream alone more than justifies the sum of the present value of installation costs, \$13,000, and the cost stream of maintenance and depreciation, \$750.

Thus very conservative benefit estimates of the Togo Rural Water Project when compared to costs indicate economic justification for the project. Adding the value of the additional benefits would only strengthen the already strong economic support for this project. The economic savings from preventive health measures are probably more important in economic terms than the value of time saved in carrying water. The other "difficult-to-quantify" benefits and the lower risks of funding an already successfully operating project further strengthen the case for additional project funding.

BRGM plays a key role in the success of the well drilling component of the project. Its sound technical services and monitoring of well construction result in efficient management of the well drilling component.

All GOT village well projects currently use the Vergnet foot pump. This pump was selected for its durability, ease of installation and maintenance, appropriateness of the range of lifts encountered and standardization of spare parts. This pump is contributed by FAC to the project.

Financial management procedures at the national and regional levels need to be strengthened. The evaluation team recommended specific technical assistance in this area. OAR/Lome has recently concluded preparations for the engagement of an international accounting firm. The firm will install an improved management and monitoring system. The firm will also provide valuable on the job training to the newly hired project Chief Accountant and other project officials. The firm's involvement will be ongoing and periodic (perhaps quarterly during the first year) in order to ensure adequate project financial accountability and provide useful project monitoring information for managerial level officials.

Other administrative concerns were raised during interviews with agents, particularly reimbursement for gasoline and per diem expenses. These issues have been the subject of working sessions involving project management, Ministry officials and OAR/Lome. Progress has been made since the evaluation team visit and OAR/Lome will continue to emphasize the resolution of these issues with GOT.

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Finally, when the evaluation team reviewed the project benefits and progress mentioned above and the steps taken in addressing project weaknesses it concluded that continued project activity beyond PACD involving additional funds was wholly justified.

C. Extension of Project

1. Revised Inputs/Outputs

a) Well Drilling - The major component of the \$3.9 million extension is the drilling of additional wells. The \$2.1 million budgeted for wells is sufficient to finance continued drilling into 1986 based on the present rate of drilling and drilling contract expenditures. This will permit the project to provide a greater concentration of wells in existing project areas, i.e., to neighboring villages of existing project villages. If present drilling success rates continue, this would add about 300 more wells. The completion of drilling in 1986 would allow about one year of follow-up activity in the health/sanitation component before the proposed PACD of 9/30/87.

With the assistance of REDSO/WCA and BRGM, Invitation for Bids (IFB) for the drilling contract will be prepared in conformity with AID regulations. The IFB will include a geological and hydrogeological description of the project area. It will specify the number of borings to be made, average depth, types of PVC casings and handpumps. The average monthly rate of 25 positive borings will be specified. The IFB will include all other details so that U.S. companies can submit bids. BRGM will analyze the bids and submit its comments and recommendations to the GOT and REDSO/WCA. After selection of the lowest responsible bid, BRGM and REDSO/WCA will assist the GOT in contract preparations.

The original project authorization approved a waiver to permit invitation for bids being extended not only to U.S. firms but also to drilling companies established in West Africa. (See original project paper for a detailed discussion of waiver justification.) Many of the same reasons for extending the IFB's beyond U.S. firms still exist today. However, there are several reasons to conclude that continuation of the present well drilling contract would be more efficient than issuing new IFBs. First, drilling is to be extended for only about two years, from October 1984 into 1986. Second, the high start-up costs make a change in contractors significantly more expensive to the project. Third, the present U.S. contractor has a proven and successful record of providing bore holes at a very economical price. Fourth, the potential delays in seeking a contractor through the IFB process could result in a disruption of this most basic component of the project. Fifth, the GOT has expressed an interest in continuing the services of the present well drilling firm. Finally, the driller has established close working relationships with projects' other donors, FAC and FED.

b) Personal Services Contractors (PSC) - Consistent with the evaluation report, a third PSC is to be employed by the project. Two Public Health planning and education specialists will continue working in much the same capacity as the current PSCs. A third specialist in environmental engineering and construction will be employed to address technical issues related to alternative water source development, latrine construction and the well program.

c) Accounting firm - As previously mentioned, an accounting firm will be engaged shortly to provide needed technical assistance to project staff. The initial engagement involving installation of an accounting system can be supplied by the Indefinite Quantity Contract for accounting services recently completed by REDSO/WCA. The accounting firm will ensure that the criteria for certification of projects in the Sahel involving local currency as defined by Section 121 (d) of the Foreign Assistance Act of 1981 will be adhered to.

d) Micro-projects - The original project paper envisioned the construction of latrines as a major part of the health and sanitation component of the project. The latrine program comprises the core of the micro-project activities about to begin.

Micro-projects are short-term and low cost activities implemented at the village level to solve health problems identified by the villagers by means of a survey conducted by them. The villagers and their health committees assisted by agents will learn a simple management system to successfully complete their projects. Follow-up, maintenance and continuity aspects are heavily emphasized in the training. Guided by the field agents during a series of five meetings, they will follow a step by step process to compose a micro-project planning dossier to be submitted to a regional project approval committee. Approval is subject to rigid criteria of appropriateness, feasibility, cost, follow-up and maintenance plans.

The labor for the micro-projects will be provided by villagers with the aid of technicians as necessary. The villagers will receive the necessary technical training to allow them to continue such activities in the future. The micro-project will be financed by a credit averaging 250,000 F CFA per project which will be made available to the villagers by the Socio-Health Program. Each micro-project should be completed in a maximum of 10 months after approval has been given. An average of 3 micro-projects in a village will be considered with first projects successfully completed before approval will be granted for 2nd or 3rd projects.

Micro-projects involve many potential administrative, commodity control and monitoring difficulties. The initiation of this activity will be modest and closely monitored by USAID/PSC staff and national

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level project management. As a pilot program to institute necessary control procedures at the regional centers where commodities will be stored as well as at the village level the project will begin 20 sample latrine construction activities in 10 villages. The success of this limited construction will determine the rate at which such projects can continue. The accounting firm will be required to review micro-project administration procedures and make recommendations for improvement. Once financial accountability, administrative capability and village level involvement are determined to be sufficient, latrine construction will be gradually expanded.

A micro-project needs to be directly complementary to the basic water and sanitation objectives of the project. It also must not require technical skills outside the range of the Ministry of Health and project personnel. Given this and the overwhelming desire by most project villages for latrines as an answer to their most basic water related health problems, micro-project activity primarily entails latrine construction. In some villages a latrine program is not viable due to a very dispersed village population or other local circumstances. In this case a micro-project alternative is a very simple mini-pharmacy or improvements of existing dispensaries and maternities. Micro-project funds could provide for minor building rehabilitation and furnishings, basic equipment and the initial stock of a few items. Pharmacy/Dispensary-Maternity projects will emphasize inputs related to maternal and child nutrition, diarrhea control and malaria prevention. Since these projects are less costly than a latrine and will be done by far fewer villages, not more than 10% of budgeted micro-project funds will be used for this purpose.

Another potential micro-project alternative is the cultivation of communal vegetable gardens or grain-fields irrigated by excess pump run-off. This use of run-off water would eliminate the potential creation of mosquito breeding sites in stagnant run-off pools and would therefore be a component of a village level malaria control effort. Vegetable or grain cultivation projects would be further linked to a mother and child nutrition activity or would serve as a source of revenue for the maintenance of the required communal pump repair fund. The Direction of Social Affairs in the MOH has extensive experience and expertise in managing such projects. Micro-project funds could provide necessary tools and initial seed stock. Village contributions could include labor, fertilizers and insecticides if necessary. No cultivation projects will be undertaken until a detailed proposal has been submitted and approved by the micro project selection committee. This proposal will be prepared by trained PCVs with their Togolese counterparts and will address the issues of continuity, feasibility, and appropriateness to local conditions and will propose a standard plan of approach.

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e) Evaluations - A second interim evaluation should be conducted in mid 1985. This will allow a two year period between interim evaluations. The evaluation will be far enough before PACD to offer further corrective recommendations. This evaluation will be less extensive and have a more narrowly defined scope than the first interim evaluation. A more intensive participation by Togolese MOH representatives is envisioned. A final evaluation will be conducted at project completion.

f) Alternate Water Sources - A major finding of the April 1983 project evaluation was that many villages have alternative water sources that could be exploited in place of or in addition to tubewells. In some cases exploitation of these alternative sources will prove more technically and/or economically feasible. Also, in many cases, they are more within the technical and economic grasp of villages and can be replicated and maintained on a "self-help" basis.

The essence of the evaluation's recommendation for alternative sources was to expand the scope of the project to "village water supply" as opposed to "village wells". The emphasis is to assess village water needs and alternative solutions on a case-by-case basis, and build in more flexibility in the program for providing domestic water supply. It was recommended that the project move in this direction on a limited basis at first, to complement the highly successful well drilling component. It was emphasized that the alternative approach is not to replace or retard the well drilling effort, but augment it in cases where feasible, especially in villages where drilling has proven unsuccessful.

In order to implement these recommendations, the project plans to add a sanitary/environmental engineer to the technical assistance team working with the Ministry of Health. Part of his or her responsibility will be to identify alternative water sources for development in appropriate villages, and to design and supervise construction of a number of these systems, initially on a pilot basis. It is expected that the engineer will work closely with the technical branch of the Ministry of Health, Sanitation division and participant villages to develop systems which can be replicated locally. Funds will be added to the project budget to finance materials and construction of these alternative sources.

A description of alternative sources follows:

Gravity Systems: There are large regions of the project area covered by forested hills which have numerous small springs and perennial streams. In many cases these springs or streams can be tapped above a village and water conveyed to the village by gravity in a pipeline. Usually, a cistern or reservoir is built at a strategic spot in the village to stock water for the hours of peak daily use. In this way, a small spring and pipeline can supply a relatively large quantity of water by storing the constant, round-the-clock discharge for use during peak demand.

If local conditions are favorable, this type of system can be considerably more economical and reliable than a well and handpump. Since the system is above ground and requires no sophisticated equipment for construction and operation, it is more within the grasp of village technology to replicate and maintain than deep wells and pumps. A large component of village participation in construction leaves in place a sense of responsibility and capability for maintenance or expansion. There have been cases where unsuccessful (dry) wells have been drilled in villages which have nearby springs which could be utilized as a gravity source.

Due to the extreme variability in terrain, water needs and other local parameters, it is impossible to design a "standard" gravity water system, such as is done with wells. However, a typical system to serve about 300 people would be made up of a spring capping and sand filter, requiring about 2 cubic meters of concrete, perhaps 1.5 km of PVC or ABS tubing (20 mm diameter), a 9,000 liter capacity concrete reservoir, and associated pipe fittings, valves and spigots. Water is drawn from the covered reservoir from multiple spigots. It is planned to construct about ten of these systems. Cost estimates for this model and the others described below are given in Financial Annex II.

Infiltration Galleries: The traditional water source for many villages are shallow pools dug into sand beds of intermittent streams. People walk to the edge of these sources and scoop up water with calabashes to fill their containers for carrying. As the water level recedes in the dry season, the pools are dug out to follow the water surface. During rains the pools are partially filled with debris and sediment. These sources are one of the primary transmitters of many water-related diseases such as Guinea worm.

A dramatic improvement can be made by construction of an infiltration gallery adjacent to a stream bed. The gallery consists of a verticle cylindrical cistern sunk into the ground of the water-bearing sand beds of the stream. The bottom is covered with a sand and gravel filter. The cistern extends above ground about a meter and serves as a protective wall. A sloping concrete slab or apron is built around the cistern at ground level to keep the area clean, seal the outside of the cistern from entry of contaminants and surface runoff and provide a support for drawers of water. The top of the cistern may be closed and fitted with a manual suction pump, or left open so water may be drawn with ropes and buckets. A typical system would be about 1 meter in diameter and 4 meters deep.

These systems may be used in place of or supplementary to deep wells with handpumps. Possibly, a communal washing basin could be constructed next to the gallery, eliminating the need to carry wash water to villages and use of a village well would be primarily for potable water. In some

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villages where well drilling efforts have been unsuccessful, these galleries can provide an acceptable primary source.

Infiltration galleries are constructed using pre-cast concrete rings or culverts placed on top of each other. Manual excavation is done down to the water level and the rings are stacked vertically. A man then enters the rings, excavates at the bottom so that the rings fall and follow the excavation to a point one or two meters below the water level. Water is evacuated with a submersible pump during construction.

There are many feasible sites for these systems which can be constructed rapidly by local crews. It is planned to construct about 50 units.

Roof Catchment: The relatively pure rainwater falling on village roofs can supply an important part of village needs. However, due to the long periods between rainfall, the storage requirements become too great to meet total needs. If roof catchment is restricted to potable water demand and another source is used for other needs such as washing and bathing, then roof catchment can provide a feasible means for improved health and reduced labor.

Average drinking requirements for a person in the tropics is about 2 liters per day, or 60 liters for an extended family of 30 members. In many areas of the Plateau Region it is rare to have periods over 50 days without significant rainfall. However, due to geologic conditions this area has the highest percentage of dry wells and project villages which have no improved source after several attempts at drilling. A concrete cistern with a capacity of 3 cubic meters could supply the potable water needs of thirty people for about 50 days. It would be necessary to construct gutters and down-pipes to collect the rainwater and in some cases the tin roof itself. A building 6 meters by 10 meters (60 square meters of roofing) would require 50 mm (2 inches) of rainfall to fill the cistern (3,000 liters). It may also be desirable to make communal systems using a tin roof from a larger community building such as a school. A village school with a roof area of 300 square meters can produce about 15 cubic meters of water from 50 mm of rain, or enough to serve the needs of about 150 people for 50 days without rain. The project plans to construct about twenty of these systems as well as 50 smaller systems of up to 6 cubic meters.

g) Participant Training - In order to assist the GOT in continuing well drilling and complementary activities beyond direct AID involvement several Togolese will receive specialized training. Training of engineers who can supervise future drilling operations will be a priority. Training of health specialists to continue the health education program and financial management training for accounting and management staff is needed. A breakdown of long-term training is included in the budget detail of Financial Annex II.

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h) Other Inputs/Outputs -

The contributions by FED and FAC are assumed to continue. This assumption is based on their enthusiastic participation in the project thus far and OAR/Lome meetings with FED and FAC representatives.

Peace Corps input will increase slightly to about 7 volunteers in each of the two project regions. New volunteers will be requested only after detailed descriptions of their project roles are prepared and reviewed jointly by Peace Corps, USAID and GOT project management.

2. Modified Project Objectives

The original project paper correctly recognized that the placing of wells is an environmental modification which can be related to improvements in health status. Yet in setting project objectives too little attention was given to the need to bring about behavioral changes. A restatement of project objectives should recognize that these, rather than measurable changes in health indicators, will be the major outputs of the health and sanitation component of the project. It is unrealistic, and would do an injustice to the project, to expect that even in the middle-term (10-15 years) health indicators such as infant/child mortality would be significantly affected by the installation of wells. With the exception of perhaps Guinea worm, which is directly and solely water-related, few measurable health status changes can be expected. Thus, project objectives should incorporate the hoped for, and quite likely to be attained behavioral changes: acquisition of organizational skills by agents and villagers, introduction and reinforcement of improved health and hygiene practices, acceptance of the notion of preventive medicine, and the like.

3. Financial Summary

The following table illustrates the breakdown of the \$3.9 million requested in this project paper amendment and its impact on the life of project budget. Financial Annex I provides a summary by input category of project funding needs from 9/30/83 to 9/30/87. See Financial Annex II for supporting budgetary information.

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Revised LOP Budget
(in thousands)

	Present LOP Budget	Proposed LOP Budget	Net Change
TA	500	1,236	736
Training	245	644	399
Drilling	4,950	7,085	2,135
Micro-projects	950	500	(450)
Commodities	225	259	34
Vehicles	220	453	233
Local Salaries	65	238	173
Operational Costs	150	295	145
Alternative Systems	-0-	130	130
Evaluation	50	52	2
Contingency/Inflation	<u>484</u>	<u>847</u>	<u>363</u>
	7,839	11,739	3,900

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4. Environmental Issues

The original project was centered around tubewells with handpumps and environmental issues were minimal. The project extension proposed in this paper will expand the scope to include the alternative water sources discussed above. These alternative systems introduce new environmental issues which are discussed below.

Virtually all the potential environmental problems introduced by the project concern health vis-a-vis collection, storage and utilization of water and proper construction and use of latrines. These problems can be prevented or solved by education and organization of users and proper technical input in design and operation of facilities. Probably the strongest single component of the project is the village health training program, whose explicit purpose is to prevent and solve these problems. This component will be strengthened by the addition of a sanitary/environmental engineer for addressing technical issues in design, construction and operation of water systems and latrines. It could be stated that the primary project purpose is improvement of the environment to acceptable levels in the domain of village water supply and sanitation.

Wells and Pumps: As stated in the original PP and verified by experience in the on-going project, the pumps and wells pose no threat to de-watering of aquifers, or "mining" of groundwater. The small quantities of pumped water (limited by the discharge of handpumps) are only a fraction of the storage and annual recharge of the aquifers in question.

Design and construction of the wells preclude contamination of the aquifers from surface infiltration or leaking. Wells are cased and grouted to prevent entry of contaminants from above or transfer of water from one aquifer to another. An apron and drain are built around the well and pump to provide a clean place for water collection. The pump design includes a small diameter down-spout which prevents willful or accidental entry of debris.

During apron construction a drain is built to convey spilled water safely away from the apron. The drain consists of a shallow furrow leading down-slope at a sufficient distance so spilled water infiltrates. In some cases villagers' zeal to maintain these drains has resulted in over-excavation near the apron, causing an adverse slope, and ponding of water. This can create a mosquito breeding site with the potential for increasing malaria. It also contributes to general uncleanness of the area. Rectification of this problem is a matter of village awareness and education which is taking place through the health training program and village committees. Gardening activities using run-off water also represent a possible solution to this problem

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Spring or Stream fed Gravity Systems: A primary task of the sanitary/environmental engineer and his/her counterparts in the Ministries of Health and Public Works will be the design and construction of these systems, fully assessing and addressing the environmental issues. Of primary importance is site selection and management of the watershed above the source. The watershed and source must be large enough during minimum flow to sustain the population. The water quality must be monitored periodically, and treatment facilities installed if required. An effective watershed management program is absolutely essential from the perspectives of both water quality and quantity. The watershed should be left in as natural a state as possible, perhaps with controlled cutting of wood. Clearing for agricultural or other use will greatly increase flood flows and sediment transport as well as decrease minimum or base flows. The watershed should be protected from any use which may introduce chemical or bacteriological contaminants. This includes human habitation, livestock, refuse disposal or potentially harmful pesticides. Needless to say, these activities become more critical as they move toward the source or system entry from the upper boundaries of the watershed. Village education and organization are the keys to watershed management.

Another potential problem with these systems is water rights and downstream users. A case-by-case study must be made of downstream users and the impact of capturing some or all of a stream or spring. In most cases a small tributary spring or stream can be tapped which does not significantly reduce downstream flow.

Pipelines and cisterns must be designed and constructed to prevent leaking and potential contamination. Cisterns should be well sealed and/or screened to preclude entry of debris, insects or pests. As in the well systems, water collection points and drains must be properly designed and maintained to provide a clean spot without ponded water.

Infiltration Galleries: Many villages are near intermittent or perennial streams which were traditionally used as water sources. In many cases these can be vastly improved and used as a primary source or supplement a well and handpump. Traditionally, pits are dug into sand layers in or adjacent to stream beds which intersect the water table. Because the sides of these pits cave in or erode during times of surface runoff it is necessary to wade in to collect water. Construction of a shallow well or infiltration gallery into these sand layers will largely solve the problem of entry of contaminants from people and animals entering the water and from surface runoff. An apron and protection wall must be built to provide a clean and safe place for drawing water. Also, the well or gallery must be placed so it is not affected by flood waters. Several options may be considered for drawing water. The first is for individuals to use private ropes and buckets brought to the source and

draw directly from an open top. This minimizes maintenance and management problems. However, personal ropes and buckets may be a potential source of contamination if they are improperly stored and handled. Another option is to use a permanent rope and bucket suspended from a pulley above the well. One end is fixed to the beam so rope slack goes down the well during drawing instead of being coiled on the apron. The bucket, rope and pulley should be heavy and permanently attached. A third option is to completely cover the gallery/cistern and install a manual suction pump.

Roof Catchments: Rainwater is essentially pure, but contamination in the form of dirt and dust may be introduced from the roof catchment and gutter. This problem is not a serious health hazard but may cause problems in social acceptability. It can be largely overcome by designing a skimmer or louvre in the gutter before entering the cisterns. The first runoff, carrying most of the sediment, is jettisoned out of the louvre. As flow increases, excess discharge passes the louvre and goes into the cistern. Also, proper cistern designs will allow flocculation of most sediments. Cisterns should be designed to have gravity outlets, eliminating contamination from buckets or an open access. They should also be sealed and/or screened to prevent entry of debris or insects.

Water Transport and Storage: A large component of the health program is education of water users on proper carrying and storage. Primary issues are keeping utensils clean, storing water in a clean area, separating potable water from washing water, and covering storage vessels to eliminate mosquito breeding sites.

Surface Water Sources: Some mention has been made about the possibility of using natural or man-made surface sources for domestic water supply. Due to the high risk of schistosomiasis, malaria, Guinea worm and other diseases associated with these sources their use should be discouraged. If for any reason a decision is made to exploit these sources, great care must be taken in development of the supply and education and organization of the users to assure that water borne diseases do not become a threat.

Latrines: Latrines will be designed and sited according to accepted sanitary standards. The project health program will educate villagers in use and maintenance of the facilities.

In summary, there are no significant environmental issues in the project other than those which the project is designed to solve. All environmental issues related to the project should remain unchanged or improve with implementation.

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Financial Plan . : Budget Summary
\$1.00 = 400 cfa

(dols 000)

	Projected Needs 10/83-9/87	Expenditures to Date	Projected LOP Expenditures
US AID			
TA	994	242	1,236
Training	600	44	644
Drilling	6,600	3,485	7,025
Micro-projects	500	-	500
Commodities	225	34	259
Vehicles	200	253	453
Local Salaries	178	60	238
Operational Costs	200	95	295
Alternative Systems	130	-	130
Evaluations	52	-	52
Contingency/Inflation (11%)	<u>836</u>	<u>11</u>	<u>847</u>
	7,515	4,224	11,739
Peace Corps	1,200	400	1,600
GOT	1,910	875	2,785
FAC	900	800	1,700
FED	<u>800</u>	<u>600</u>	<u>1,400</u>
TOTAL	12,325	6,899	19,224

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Financial Plan : Budget Detail 10/83 - 09/87

USAID

7,515,000

1. Technical Assistance : 993,750

- A) Accounting Firm (50 pd) 33,500
 - an initial 30 pd training
 - with two 10 pd follow-up on
 - a quarterly basis for 2
 - quarters.
 - 50 pd x \$670.00

- B) Personal Service Contractors (3) 960,250
 - for total of 11 1/2 person years
 - 1. Compensation 345,000
 - 2. Post Differential 86,250
 - 3. Post Allowance (COLA) 23,000
 - 4. Housing/Utilities 158,000
 - 5. Logistical Support 69,000
 - 6. International Travel 46,000
 - 7. Local Travel 69,000
 - 8. HHE/Air Freight 92,000
 - 9. FICA 34,500
 - 10. Other Costs 57,000

2. Training : 600,000

- A) In-country 200,000
 - 1. quarterly agent training 96,000
 - 5 d x 120 agents x \$10/d x 4 yrs
 - 2. quarterly village health committee training 29,400
 - 1 d x 1,050 p x \$1.75 d x 4 y
 - 3. yearly agent technical training (latrines, cisterns, etc.) 28,800
 - 12 d x 60 a x \$10/d x 4 y
 - 4. yrly technician technical trng (masons, carpenters for latrines, alternate water, etc.) 20,000
 - 10 d x 50 people x \$10/d x 4 y
 - 5. Hydraulic service pump maintenance training of trainers 14,400
 - 60 d x 6 people x \$10/d x 4
 - groups total 14,400
 - Contingency 11,400

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B) Participant (13)		400,000	
1. project management/ evaluation			
1 p x 2 y x \$25,000/y	50,000		
2. accountant			
1 p x 2 y x \$25,000/y	50,000		
3. public administrator			
1 p x 2 y x \$25,000/y	50,000		
4. health education planner			
1 p x 2 y x \$25,000/y	50,000		
5. health education communicator			
1 p x 1 y x \$25,000/y	25,000		
6. public health researcher			
1 p x 2 y x \$25,000/y	50,000		
7. hydrogeologue			
1 p x 2 y x \$25,000/y	50,000		
8. hydrophysicist			
1 p x 2 y x \$25,000/y	50,000		
9. solar pump engineer			
1 p x 1 y x \$25,000/y	25,000		
3. Drilling (600 wells x \$6,000/w)			3,600,000
4. Micro-projects			500,000
A) Latrines (4 place)		450,000	
1. 900 x \$450	405,000		
2. Tools (\$2,250/team x 20 t)	45,000		
B) Gardens (tools, seed)		10,000	
C) Dispensary/Maternity repair/equipment		40,000	
5. Commodities			225,000
A) Social Affairs		26,000	
1. Telephones 5 x \$250	1,250		
2. Electronic Stencil 1 x \$2,000	2,000		
3. Mimiograph electric 1 x \$1,000	1,000		
4. Typewriter manual 3 x \$625	1,900		
5. Calculators 4 x \$250	1,000		
6. Air conditioners 10 x \$750	7,500		
7. Furniture			
a. desks 4 x \$125	500		
b. cabinets 6 x \$125	750		
c. chairs 18 x \$12	250		
8. Safe			
a. 1 x \$875	875		
b. 2 x \$500	1,000		
9. garage tools 2 x \$4,500	9,000		

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B) Hydraulic service	19,000	
1. Geological logging system		
1 x \$16,000	16,000	
2. Portable water testing kit		
2 x \$1,500	3,000	
C) Village Health Campaign	24,000	
posters, t-shirts, music, etc.		
6 campaigns x \$4,000/c		
D) School health education campaign		
visual aids, training materials		
300 schools x \$200/s	60,000	
E) Village health adult literacy		
campaign		
booklets, visual aids, training		
materials		
350 villages x \$200/v	70,000	
F) Project PR photographic		
documentation	25,000	
6. Vehicles		200,000
A) 4 wheel (11)	88,000	
1. 19 place station wagon (3)		
(1 Social Affairs, 2/PSC)		
3 x \$9,000	27,000	
2. Pickups (6)		
4 Social Affairs,		
2 Hydraulic Services		
6 x \$6,500	39,000	
3. 4 WD pickups (2)		
(alternate water)		
2 x \$11,000	22,000	
B) Motorcycles - 100 cc (120)		
(Social Affairs, Health)		
120 x \$750	90,000	
Contingency	22,000	
7. Local Salaries (56)		178,000
A) Bilingual Secretary (1)		
1 p x \$150/m x 4 py	7,200	
B) Chief Accountant (1)		
1 p x \$225/m x 4 py	10,800	
C) Masons (20)		
20 x \$75/m x 70 py	63,000	

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D) Carpenters (10)		
10 x \$75/m x 35 py	31,500	
E) Iron Worker (4)		
4 x \$75/m x 15 py	12,600	
F) Assistant Mason (20)		
20 x \$63/m x 70 py	52,900	
8. Operations - 3 years only GOT 4th y		200,000
A) Office supplies	15,000	
\$5,000 x 3		
B) Office rent		
\$250/m x 3 y	9,000	
C) Office utilities		
\$200/m x 3 y	7,200	
D) Telephone		
\$200/m	7,200	
E) Vehicle PLO	75,000	
\$25,000/y x 3 y		
F) Vehicle spare parts	60,000	
\$20,000/y x 3 y		
Contingency	26,000	
9. Alternate Water Systems		130,000
A) Gravity (10 systems)		
1. Concrete spring box 2m		25,000
10 x \$500	5,000	
2. Concrete resevoir 9m ³		
10 x \$500	5,000	
3. PVC pipe 2 km		
10 x \$1,000	10,000	
4. Valves/fittings		
10 x \$100	1,000	
5. Contingency		
10 x \$400	4,000	
B) Roof Catchment (20 community systems)		30,000
1. Concrete resevoir 15m ³		
20 x \$1,000	20,000	
2. Gutters/down pipe		
20 x \$150	3,000	
3. Spigots & valves		
20 x \$50	1,000	
4. Contingency		
20 x \$300	6,000	

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C) Roof Catchment (50 small systems)		30,000
1. Concrete resevoir 6 m ³		
50 x \$400	20,000	
2. Gutters/downpipe		
50 x \$30	1,500	
3. Spigots & valves		
50 x \$20	1,000	
Contingency	7,500	
D) Infiltration Galleries (50 systems)		45,000
1. Concrete culverts		
5 x 50 x \$50	12,500	
2. Concrete apron		
50 x \$200	10,000	
3. Hand pump/pipe		
50 x \$100	5,000	
4. Contingency		
50 x \$200	10,000	
5. Special equipment		
a. Power pump		
2 x \$1,000	2,000	
b. Hand winch		
2 x \$500	1,000	
c. Culvert molds		
4 x \$250	1,000	
d. Portable crane		
2 x \$1,000	2,000	
e. Other tools		
2 x \$750	1,500	
10. Evaluation (2)		52,000
A) Salary/per diem		
2 p x 20 d x \$250/d x 2	20,000	
B) Per diem GOT staff		
3 p x 20 d x \$60/d x 2	7,200	
C) Airfare		
2 p x \$2,000/p x 2	8,000	
D) Up-country fuel		
2 vehicles x \$500/v x 2 trips	2,000	
E) Translation service		
2 x \$4,000	8,000	
Contingency		6,800
Contingency/Inflation (11 %)		836,000

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Peace Corps 1,200,000

Peace Corps Volunteers (15)
15 PCVs x \$20,000/y x 4 y

GOT 1,910,000

1. Personnel (150) 1,860,000

- A) Agents
120 agents x \$300/m x 4 y each 1,728,000
- B) Secretary
2 x \$150/m x 4 y each 12,600
- C) Accountant and Warehouseman
2 x \$175/m x 4 y each 14,700
- D) Bookkeeper
1 x \$100/m x 4 y 4,800
- E) Drivers (14)
14 x \$75/m x 4 y each 50,400
- F) Mechanics (3)
3 x \$75/m x 4 py each 10,800
- G) Messengers/guards (8)
8 x \$100/m x 4 py each 38,400

2. Operations 4th year 50,000
1 year x \$50,000

FAC 900,000

- 1. 600 pumps x \$1,000/p 600,000
- 2. Installation 150,000
600 x \$250/p
- 3. Spare Parts 150,000
600 pumps x 25%

FED 800,000

1. Well construction supervision 600,000
1 1/2 TA x \$150,000/y x 4 y

2. Pumps Maintenance 200,000
1,000 pumps x \$200/p

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Implementation Plan

I. Well Drilling executed by a host country contract.

From the period of January 1984 through the PACD in September 1987 a total of 500 positive wells will be drilled at the rate of 25 wells a month, 10 months a year (excluding the rainy season months of August and September). In the Plateaux region 275 positive wells will be drilled and in the Savanes region 225 positive wells. All well drilling activities are expected to be completed by 1986.

II. Alternate Water Systems executed by two, 2 1/2 person teams per region.

A) Rainwater Harvesting: Community and small scale cisterns.

Alternate water systems development will start in April 1984 in the Savanes region with a two month retraining period for Social Affairs and Sanitation agents and two teams of masons, mason's assistants and carpenters in construction of rainwater harvesting and cistern systems. During this period 2 large scale community systems and 4 small scale systems will be constructed. The trained teams will continue construction independantly at the rate of 2 large scale and 4 small scale systems a month during the four remaining dry season months of 1984. Small scale systems construction will continue at the rate of 2 a month during 8 dry season months in 1985 terminating in December 1985 with the total of 10 large scale and 36 small scale rainwater harvesting systems. The reduced rate of construction in 1985 corresponds to the increase in latrine construction at that time.

In the Plateaux region, the training of agents and construction teams will take place in October and November 1984 and result in the construction of 2 large scale and 4 small scale systems. The teams will continue construction independantly at the average rate of 2 large scale and 3 small scale systems a month during those dry season months when there are no conflicting activities. All rainwater harvesting activities are expected to be completed by November, 1985 with a total of 10 large scale and 14 small scale systems in the Plateaux region. In 1986 and 1987 the Social Affairs and Sanitation agents will conduct follow-up and maintenance activities in the concerned villages.

As a result of the greater abundance of alternative water resources in the Plateaux region, the need for rainwater harvesting systems is expected to be greatest in the Savanes.

B) Spring Captation

Ten spring captation systems are planned for the Plateaux region.

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They will be constructed at the rate of 1 a month during the height of the dry season (December - March) each year through January 1987. Training resulting in the completion of two systems will occur during December of 1984 and January 1985. Follow-up and maintenance activities with VHC's will continue through 1987.

c) Infiltration Galleries

A total of 50 infiltration galleries of which 30 in the Plateaux and 20 in the Savanes region will be constructed. Construction will occur during the height of the dry season in both regions (November - March in the Plateaux, December - April in the Savanes). In the Plateaux, training of agent and mason teams will occur simultaneously with Spring Captation training (December 1984 and January 1985) and result in completion of two infiltration galleries. Construction will continue independently at an average rate of 2 a month until March 1986 and 4 a month from November through February of 1987 when other alternative water systems construction activities will have been completed. In the Savanes region training of supervision and construction personnel will occur in February and March 1985. Construction will continue thereafter at the average rate of 2 a month until completion of all galleries in February of 1987.

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Overview of Water Systems Development from January 1984 - September 1987

DATE	PLATEAUX REGION					WELLS	SAVANES REGION		
	WELLS	CISTERNS		SPRINGS	INFILTRATION GALLERIES		WELLS	SMALL	LARGE
1984									
JAN	25								
FEB	25								
MARCH	25								
APRIL	25						2	1	
MAY						25	2	1	
JUNE						25			
JULY						25			
AUG							4	2	
SEPT									
OCT		2	1			25	4	2	
NOV		2	1			25	4	2	
DEC		1	1	1	1	25	4	2	
YEARLY TOTAL	100	5	3	1	1	150	20	10	0
1985									
JAN				1	1	25			
FEB				1	2	25	2		1
MARCH				1	2	25	2		2
APRIL	25	4	2				2		
MAY	25	3	2				2		
JUNE	25								
JULY	25								
AUG		2	2				2		
SEPT									
OCT	25		1				2		
NOV	25				1		2		
DEC	25			1	2		2		2
YEARLY TOTAL	175	9	7	4	8	75	16	0	5

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Overview of Water Systems Development from January 1984 - September 1987

DATE	PLATEAUX REGION				:	SAVANES REGION				
	WELLS	CISTERNS		INFILTRATION		WELLS	CISTERNS		INFILTRATION	
		SMALL	LARGE	SPRINGS	GALLERIES		SMALL	LARGE	GALLERIES	
1986										
JAN				1	2				2	
FEB				1	2				2	
MARCH				1	2	:			2	
APRIL						:			2	
MAY						:				
JUNE						:				
JULY						:				
AUG						:				
SEPT						:				
OCT						:				
NOV					4	:			2	
DEC				1	4	:			2	
YEARLY TOTAL	0	0	0	4	14	:	0	0	0	12
1987										
JAN				1	4	:			2	
FEB					3	:			1	
MARCH						:				
APRIL						:				
MAY						:				
JUNE						:				
JULY						:				
AUG						:				
YEARLY TOTAL	0	0	0	1	7	:	0	0	0	3
GRAND TOTAL	275	14	10	10	30	:	225	16	10	20

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III. Micro Projects

A) Latrines executed by 20 2 1/2 person teams.

Latrine construction activities will start in the Plateaux region with a training and pilot project which will result in the construction of 55 two to six hole latrines (average of 4 holes) in 10 villages (at an estimated population of 30 people per hole, these latrines will satisfy the needs of $30 \times 4 \times 55 = 6,600$ people). Pilot latrine construction activities will commence in February 1985 at the rate of between 5 and 10 latrines per month slowly increasing to 15 latrines per month. Pilot latrine construction will be completed in July 1984. After a two month evaluation and reassessment period, latrine construction will recommence in both the Plateaux and Savanes regions at an average rate of 25/month (15/mo in Plateaux and 10/mo in Savanes). Starting in January 1985 latrine construction will occur at a rate of .30 per month (1.5 latrines/mo. per mason team) for 10 months a year excluding 2 months during the rainy season (300 latrines per year). Latrine construction activities are expected to be completed by July 1987 and result in the construction of 600 latrines in the Plateaux region (sufficient for 72,000 out of 155,000 villagers in the project zone) and 300 latrines in the Savanes region (sufficient for 36,000 out of 90,000 villagers in that region) or a total of 900 latrines in both regions.

B) Other Micro Projects

These include pharmacy/dispensary and gardening projects. None of these projects will begin until a feasibility study has been completed and a detailed plan of action has been agreed on by GOT and USAID project managers. However it is expected that at least 10 of these projects may be started in the Plateaux region in 1984 at a rate not to exceed 2 per month starting in July. After a period of evaluation and reassessment, a total of 52 such projects (10 for the Plateaux and 42 for the Savanes) have been scheduled for 1985 and no more than 80 (20 in the Plateaux and 60 in the Savanes) for 1986. The monthly rate of start-up of these projects is not to exceed 2 per month in the Plateaux and 6 per month in the Savanes. The higher number of such projects in the Savanes reflects the lesser number of expected latrine constructions and also the greater intensity and therefore experience of existing gardening activities in this region. No other micro-projects are scheduled for 1987 as these projects, although much less costly than latrine construction activities, require longer and more careful follow-up.

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IV. Other Health Education Activities

A) Health Education Campaigns

Six major health education campaigns are scheduled to occur at a rate of 2 per year starting in January 1984. They will take place in both regions more or less simultaneously. Each campaign will start with the training of field agents and village health committee members who will be responsible for organizing educational activities using a multi-media approach at the village level. Each campaign will focus on a limited set of related messages and will last an average of 4 months. Health education campaigns have been scheduled as follows:

- January - June 1984 : Pump maintenance, water usage, water storage, Guinea worm prevention (Water use for disease prevention)
- July - December 1984 : Oral Rehydration, diarrhea control and fever management (Medicinal uses of water)
- January - June 1985 : Latrines maintenance, fecal-oral disease prevention (Hygiene and sanitation for disease prevention)
- July - December 1985 : Child nutrition and growth monitoring (Food for disease prevention)
- January - June 1986 : Health maintenance, vaccinations, health surveillance
- July - December 1986 : Open - to be determined

B) Agent and Villager Training Cycles

Four yearly training cycles for both regions have been scheduled. Each cycle consists of a training seminar for field agents lasting from 3 to 4 days, followed by a 1 day training of selected village health committee members. These training cycles are the first step in any major project activity and result in the detailed planning of village level activities by agents and health committee members. Two cycles a year will be primarily concerned with the health education campaigns. The remaining two cycles will focus on other project activities as appropriate.

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C) School Health, Literacy and Guinea Worm Control

Plans for these three sub-projects are currently being completed by project personnel and concerned GOT officials. Each of these activities is being designed to intensify the impact of the Health Education campaigns at the village level. School health and literacy activities have been derived from and will work in close collaboration with active on-going M.O.H. activities in these areas. All three activities are scheduled to begin in 1984 and continue throughout the life of the project.

V. Evaluation

Two evaluations have been scheduled, one around May 1985 and one in June-July 1987. It is hoped that these evaluations will be designed so as to train host country personnel to carry out future evaluations independently and that host country participation in the evaluation process will be significantly more intense than during the previous mid-term evaluation carried out by REDSO.

OVERVIEW OF SOCIO-HEALTH ACTIVITIES FROM JANUARY 1984 - SEPTEMBER 1987

DATE	Plateaux Region		Savanes Region		Health Education Campaigns	Plateaux and Savanes Regions Agent-Villager Training	Savanes Regions Related Activities	Evaluation
	Micro-Projects Latrines	Other	Micro-Projects Latrines	Other				
1984								
JAN	-	-	-	-	I	Health Ed. campaign	Begin Guinea worm control project in Savanes	
FEB	5	-	-	-	Pump maintenance			
MARCH	5	-	-	-	Guinea worm Water storage	Other Activities		
APRIL	10	-	-	-				
MAY	10	-	-	-				
JUNE	10	2	-	-	II.	Health Ed. campaign	Begin literacy program	
JULY	15	2	-	-	ORT, Diarrhea and Fever control			
AUG	-	2	-	-				
SEPT	-	2	-	-				
OCT	15	2	10	-		Other Activities	Intensive sch hlth act in 2 rgns	
NOV	15	-	10	-				
DEC	15	-	10	-				
YEARLY TOTAL	100	10	30	0	2	4		
1985								
JAN	20	2	10	6	III	Health Ed. campaign	Begin Guinea worm control in Plateaux	
FEB	20	-	10	6	Latrine maintenance			
MARCH	20	2	10	6	Fecal-oral disease trans-	Other Activities		
APRIL	20	-	10	6	mission			
MAY	20	2	10	-				
JUNE	20	-	10	-				
JULY	20	2	10	-		Health Ed. campaign	Intensive school health activities in both regions	Mid-Term
AUG	-	-	-	-	IV			
SEPT	-	2	-	-	Child nutrition, weight monitoring			
OCT	20	-	10	6		Other Activities		
NOV	20	-	10	6				
DEC	20	-	10	6				
YEARLY TOTAL	200	10	100	42	2	4		1

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OVERVIEW OF SOCIO-HEALTH ACTIVITIES FROM JANUARY 1984 - SEPTEMBER 1987

DATE	Plateaux Region		Savanes Region		Health Education Campaigns	Plateaux and Savanes Regions		Evaluation
	Micro-Projects Latrines	Other	Micro-Projects Latrines	Other		Agent-Villager Training	Related Activities	
1986								
JAN	20	2	10	6	V	Health Ed.		
FEB	20	2	10	6	HLth mainten-	campaign		
MARCH	20	2	10	6	ance			
APRIL	20	2	10	6	Vaccinations	Other		
MAY	20	2	10	6	HLth surveil-	Activities		
JUNE	20	2	10	6	lance			
JULY	20	2	10	6		Health Ed.		
AUG	-	2	-	6	VI	campaign		
SEPT	-	2	-	6				
OCT	20	2	10	6	Open	Other	Intensive	
NOV	20	-	10	-		Activities	sch health	
DEC	20	-	10	-			activities	
YEARLY TOTAL	200	20	100	60	2	4		
1987								
JAN	20	-	10	-				
FEB	20	-	10	-				
MARCH	20	-	10	-	Follow-up	Follow-up		
APRIL	20	-	10	-	and			
MAY	20	-	10	-	Review	Evaluation		
JUNE	20	-	20	-				
JULY	20	-	-	-				
AUG	-	-	-	-				Final
YEARLY TOTAL	100	0	70	0	0	2		Evaluation
GRAND TOTAL	600	40	300	102	6	18		1
								2

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VI. Project Personnel

A) Field Agents

Approximately 120 extension agents from the Ministry of Health Divisions of Social Affairs, Sanitation and Health Education have been assigned to the project by the GOT on a full time basis. These agents work in two person teams each of which is permanently responsible for between 5 and 20 project villages. The extension agents fulfill the following duties:

- 1) Training of other agents and village health committee (VHC) members;
- 2) Supervision and follow-up of VHC activities;
- 3) Supervision and assistance in latrine construction, alternative water activities and other village level projects;
- 4) Participation in project planning, educational materials development and evaluation activities.

AID technical advisors and host country technicians provide agents with additional training to carry out these activities as necessary.

B) Construction Personnel

In order to carry out the latrine construction and alternative water source activities, 20 teams of construction workers will be constituted. Each team will consist of a two-member core of a mason and a mason's assistant. One carpenter will be assigned to every two teams. In addition two iron workers will be assigned to each project region. The primary activity of these construction teams will be latrine construction. On a rotating basis between 2 and 4 teams will be especially trained to carry out construction activities related to specific alternative water systems. These especially trained teams will carry out latrine construction and water source activities concurrently.

Personnel for the 20 construction teams will be drawn where possible from existing MOH personnel, however, the project will hire as many additional persons as necessary. Training will be carried out by the AID environmental engineer and host country technicians.

C) Support Personnel

Secretaries, drivers, accountants, warehousemen for regional micro-project warehouses, mechanics and other support personnel will

be provided by the GOT as possible. An American accounting firm will be hired to train 1 national level and 2 regional level accountants and 2 regional warehousemen to manage financial and materials accounting for micro-project and other activities. The firm will provide periodic training and review over the period of one year. Two Peace Corps volunteer management advisors have been requested to serve as regional advisors to the accountants and warehousemen so as to follow-up and reinforce the training supplied by the firm.

D) Peace Corps Volunteers

A total of up to 20 Peace Corps volunteers are expected to work on the project at any one time. Currently 11 volunteers are assigned to the project on a full time basis. They include 4 gardening volunteers, 2 mechanics, 3 health education/community development volunteers, 1 epidemiologist and 1 school health educator. At least 5 of these volunteers will terminate their services in 1984. Plans have been made to request an additional 8 volunteers in the following skills areas: management, spring captation and construction, mechanics, cooperatives, school health education. The volunteers are considered in the same category as the field agents and like these agents participate in all project activities, bringing their special technical abilities to bear as necessary. Their counterparts are either division-level Social Affairs directors or other agents. Their planning and organizational skills are highly valued by their Togolese team members.

E) Project Management and U.S. Technical Assistance

Upper level project management consists of a Project Coordinator who is a Social Affairs director assigned to the project by the GOT on a full time basis, two regional directors of Social Affairs and two regional directors of Sanitation who oversee project activities as part of their regular duties and, currently, two US public health specialists, one assigned to Lome and one to the Plateaux region. Starting in 1984, U.S. technical assistance will be increased to three people: a public health planner assigned to the National Coordinator's office in Lome, an environmental engineer assigned to the Plateaux region and a health education specialist assigned to the Savanes region. All three will travel as necessary to make their services available at either the regional or national levels. The T.A.'s responsibilities include assistance to GOT personnel in the following areas:

- 1) training of field agents (including PC volunteers)
- 2) planning, organization and management of project activities

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- 3) development of educational materials for agents and villagers
- 4) on-going evaluation and reassessment of project activities
- 5) follow-up of field activities and in-the-field technical support to field agents.

Close collaboration with regional directors is considered by GOT and USAID project staff to be crucial to successful project implementation. The permanent assignment of an American advisor to each of the project regions up-country will permit the Lome based advisor to provide full-time administrative and technical support to the National Project Coordinator and insure proper coordination of all project activities.

Discussions have been initiated to increase GOT technical support staff by an environmental engineer and a health education/community development specialist in order to ensure effective follow-through of project activities after PACD.

Project Issues

1. Micro-projects

The reduction of the scope of the latrine program and the concomitant increase in the range of micro-project activities to alternative health-related actions.

Discussion

In accordance with the Project Authorization and the original Project Plan (pp 16-17), a health and sanitation component plan was completed in December 1982 by GOT and American project personnel and was approved by USAID and GOT Ministry of Health by the signing of the 6th amendment to the project, which includes the socio-health program plan content section, in April 1983. (Annex I, pg 5-11). The complete plan was also signed by the Minister of Health (M0H) in April 1983. This plan follows the guidelines laid out in the PP (pp 14-20) in all respects including the provision that detailed regional and village level activities planning will occur in close collaboration with important local officials (PP, p. 17). Before this major plan was concurred upon, initial socio-health activities during 1981-1982 were based on a general approach derived from the PP and agreed on in September 1981 by the then GOT national Coordinator and the USAID project and OAR staff. The final plan was the result of a year's field experience with this initial approach and includes the following elements as suggested in the PP (p. 16): program goals and objectives; a definition and methodology of health education; content of health education; training methodology, schedule and requirements; program supervision and management; program logistics and material resource needs. The cornerstone of the final plan (and the justification for the micro-project component) is found in the program objectives and the definition and methodology of health education. (Annex I pg 2-4)

The PP (p. 14) points out that positive impact of safe water on health depends on related behavioral changes in the water-users. The socio-health program plan objectives are stated in behavioral terms related to health improvements. It is a well accepted educational theory that behavioral change does not result merely from increased access to knowledge or from simple attitudinal changes. Repeated practice of the desired behavior is required before lasting behavioral changes can be expected to occur. Changes in practice require improvements in technical and organizational skills which can only be acquired by doing. Figure I presents the conceptual framework on which the socio-health program is based.

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Figure I

SOCIO-HEALTH PROGRAM CONCEPTUAL FRAMEWORK

VILLAGE LEVEL PROGRAM INPUTS	Leads to	VILLAGER SKILLS DEVELOPMENT	Leads to	PRACTICED BEHAVIORAL CHANGES	Leads to	IMPACTS: CHANGES IN HEALTH INDICATORS
With assistance of trained MOH extension agents		1) attitudinal changes (motivation for change)		1) changes in water utilization and water storage		Reduced morbidity and mortality due to:
1) provision of safe water supplies		2) increased health-related knowledge		2) maintenance of village water and sanitation structures		- Guinea worm
2) creation and training of village health committee (VHC)		- disease causation - disease prevention - disease control		3) improved sanitary habits		- Diarrheal disease
3) regular dialogue and planning between villagers and MOH personnel		3) improved planning and organizational skills. - committee organization - problem identification and analysis - project planning - organization and supervision of activities - evaluation, record-keeping		4) improved personal hygiene practices		- Malaria
4) regular health education about village identified health problems				5) improved at-home primary treatment of diarrheas, malaria, skin conditions, etc.		- Skin and eye diseases
5) mass-media health information campaigns				6) improved preventative practices (vaccinations, malarial prophylaxis)		- Under nutrition
6) assistance in micro-project planning		4) improved technical skills - latrine construction - gardening - communication and training skills - simple preventative and curative skills (for diarrhea, malaria, skin conditions, etc.)		7) improved dietary practices		- Childhood Communicable Disease
7) technical training during micro-project execution						

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Health education is defined by GOT and USAID/OAR project personnel as a continuous learning process during which a community acquires and actively applies and evaluates knowledge and technical and organizational skills necessary to the resolution of its health problems. The methodological approach chosen consists of guiding community members, step-by-step, through a learning cycle which starts with the identification of a problem by the community, proceeds to a joint causal analysis of the problem and the choice of feasible solutions, leads to the planning and execution of concrete actions and terminates with evaluation and reassessment. The micro-projects are conceived as the action component of the learning cycle (used in all program education and training activities) which started in each project village with the identification of a priority health problem by villagers with the assistance of the field agents. (Annex I pg 3-11) . Although only micro-projects requiring materials provided by the project are mentioned in this document, in reality each micro-project is only one of a composite of actions designed to address the identified problem. Many of these actions such as village clean-up, vaccination efforts, drainage of mosquito breeding sites etc. require no project input. Five major health problems have been identified in the Plateaux region where villagers have already progressed to the planning stage of the action component. These problems are: diarrheal disease, intestinal parasites, malaria, Guinea worm and measles. While latrine construction is an appropriate response to the first two problems, clearly, in order to bring the learning cycle to its logical conclusion other kinds of micro-projects must be envisioned in those villages whose village health committees (VHC's) identified one of the last three as their primary health concern. These other micro-projects could include improvements in pharmacy/dispensaries related to malaria prophylaxis, nutritional monitoring or vaccinations; gardening activities related to improved child nutrition in relation to measles and the creation of laundry areas and footrests at Guinea worm infested water sources (especially where pump water is insufficient to meet all water needs). It is expected that by tying the micro-projects clearly to village-identified health priorities and deriving these projects from analyses done with and by villagers, many traditional problems of long-term follow-through can be reduced or avoided. Once the first micro-projects have been completed VHCs will be encouraged to repeat the process with assistance from field agents as necessary. The micro-project component is the main project activity that is expected to continue after PACD: due to the organizational and technical skills which will be acquired by villagers and extension agents during the execution of the micro-projects, the micro-project process will be repeatable independant of USAID assistance and long-term impacts can be expected beyond the health sector to other development sectors including agriculture and income-generating activities.

The latrine component of the micro-project activities has been reduced from a suggested level, in the PP, of one one-hole latrine for every 12

people (which, at the original estimate of 128,000 people in the 350 project villages, works out to a total of 10,666 one-hole latrines) to approximately 900 latrines averaging four-holes each and serving 120 people (or 30 people per hole). The actual number of holes per latrine will vary between one and six and will depend on socio-cultural, geographical and environmental factors in each village. The choice of the 30 rather than 12 person per hole capacity is derived from international standards accepted by GOT Division of Sanitation technicians. The actual estimated population of the 350 project villages is 245,000. Nine hundred (900) four-hole latrines serving 30 people per hole will satisfy the needs of an estimated 108,000 villagers or less than half the total estimated project village population. The principle agreed upon with the GOT posits that any village opting for latrines as its micro-project will agree to construct sufficient latrines to meet the needs of its entire population. This is essential if the latrine construction activities are to have the expected impact on diseases transmitted by fecal contamination of the environment. Given the recognized importance of diarrheal and fecally related parasitic diseases, especially in the Plateaux region, an extension of latrine construction activities beyond the 900 currently planned may be considered desirable. However, the construction of each additional 45 to 50 four-hole latrines would require the services of an additional 2 1/2 person construction team for a full 3 years. To attain the initial PP goal of 10,666 one-hole latrines an additional 135 to 145 construction workers would be required for a 3 year period each. To cover the needs of the entire estimated population of the actual 350 project villages, even at the revised rate of 30 people per hole, would require an additional 60 construction workers beyond the presently planned 55, for the full three year period. This additional logistical and supervisory burden far exceeds the management capacity of this project. Therefore, the latrine component has been reduced to a manageable size given the substantial personnel and material requirements of latrine construction. The concomitant expansion of the range of possible micro-projects to include appropriate responses to water-related health problems has been limited to activities which do not require personnel or technical skills beyond the current capabilities of existing project staff.

2. Negotiated procurement/single source waiver for an extension of a host country contract including an increase of funding for well-drilling

Discussion

The original project authorization approved a waiver to permit invitation for bids (IFB) being extended not only to U.S. firms but also to drilling companies established in West Africa. (See original project paper for a detailed discussion of waiver justification.) Many of the same reasons for extending the IFB's beyond U.S. firms still exist today. However, there are several reasons to conclude that continuation

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of the present well drilling contract would be more efficient than issuing new IFBs. First, drilling is to be extended for only about two years, from October 1984 into 1986. Second, the high start-up costs make a change in contractors significantly more expensive to the project. Third, the present U.S. contractor has a proven and successful record of providing bore holes at a very economical price. Fourth, the potential delays in seeking a contractor through the IFB process could result in a disruption of this most basic component of the Project. Fifth, the GOT has expressed an interest in continuing the services of the present well drilling firm. Finally, the driller has established close working relationships with project's other donors, FAC and FED.

Thus, a negotiated procurement/single source waiver for an extension of a host country contract including an increase of funding is attached to this PP amendment as Annex II B.

3. Issue: a second source/origin waiver for the procurement of replacement and additional motor vehicles from geographic code 000 to geographic code 935.

Discussion

See a "Justification for Waiver" attached to this project paper amendment as Annex II A.

4. Issue: GOT Management Deficiencies

Discussion and Proposed Resolution

One recommendation of the project mid-term evaluation was to strengthen the GOT financial and administrative management capability of the Socio-Health component. The following actions are being taken in response to this recommendation.

- a) A chief accountant with an MS in financial administration and accounting has recently been hired and assigned to the National Coordinator's Office.
- b) Steps have been taken to engage an international accounting firm to provide training to this accountant and other project managers. Additional non-financial management training is being prepared for national and regional project personnel.
- c) USAID has taken steps to hire a third U.S. PSC and to take on increasing responsibility for administrative and managerial support at the national level.

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- d) The Minister of Health and Social Affairs has assigned the National Project Coordinator full-time to the project with reporting requirements directly to the director of his cabinet. In addition, the MOH is being requested to increase its senior technical and logistic support staff, which will be a component of the planned ProAg amendment.
- e) The GOT has already increased its official full-time project field staff from 85 to 120 agents. These will receive additional support from Peace Corps volunteers whose number will increase by request of the GOT from 10 up to 20 for LOP, of which two PCV MBAs will be assigned to the regional level.

It is expected that these actions combined with increased GOT attention to the issue of management of the project will significantly improve project implementation.

5. Issue: Alternate Water Sources

Discussion

Because of unforeseen geological conditions, well-drilling was unsuccessful in approximately 50 of the 350 project villages. Unfortunately, these villages are among those with the most desperate water shortages. In many of these villages the possibility exists of providing potable water through other low-cost appropriate systems such as spring captation, rainwater harvesting or infiltration galleries. This possibility was explored during the mid-term evaluation and constitutes one of its major recommendations. In addition, during its recent Second National Water Decade Convention, the GOT reaffirmed its policy and strategy to provide potable water to villages through a range of alternate water technologies not limited to deep bore wells.

OAR/Lome concurs with the mid-term evaluation recommendation and GOT policy that including alternate low-cost water technologies is an effective and feasible solution to these problems.

ANNEX I

Excerpts from Socio-Health Program Plan
(translated from the original French)

Excerpt I : Program Goals and Objectives

A) Program Goals (Long term)

- 1) Improvements in village health standards by:
 - prevention of diseases related to water and environmental sanitation, for example
 - Guinea worm
 - Intestinal parasites
 - Diarrheal diseases
 - other related infections
 - reduction of infant mortality caused by diarrhea and dehydration
 - improvement of childhood nutritional status (children under 5 yrs)
- 2) The taking of responsibility by villagers for their own health and socio-economic development, including
 - the maintenance of the water pumps
 - the improvement of village sanitary and hygiene conditions
 - various other communal development activities

B) Program Objectives (short and medium term)

To assist village populations to:

- 1) install in each project village, a respected and self-motivated Village Health Committee, whose role will be to analyse, study and help implement activities in order to arrive at permanent solutions to village health problems.
- 2) establish in each village a viable system of pump maintenance and repairs.
- 3) use potable water consciously and regularly and avoid contaminated water sources so as to reduce the frequency of water-related diseases.
- 4) recognize, analyze and react systematically to their own health problems, using locally available resources, supplemented as necessary by outside resources.
- 5) execute in each village at least one project whose object is to resolve a health problem identified by the health committee using the systematic planning process introduced by the socio-health program.

- 6) practice elementary health measures to prevent and treat infant diarrhea (ORT), malnutrition and other common village illnesses.
- 7) establish active relations between the VHCs and the rural government extension services.
- 8) exploit alternative sources of potable water in villages where well drilling activities did not succeed in providing a quantity of potable water sufficient to meet village needs.

In order to achieve the above village level objectives the following objectives must also be met:

- 9) to reinforce active collaboration between the various GOT extension services working for the socio-economic and health related development of the villages.
- 10) to reinforce the skills and methodological aptitudes of the Social Affairs agents.
- 11) to intensify a certain number of actions in the Direction of Social Affairs such as:
 - adult literacy
 - nutritional centers
 - women's cooperatives
 - collective agricultural projects

Excerpt II : Definition of Health Education and Methodological Approach

The socio-health program is fundamentally an educational program. This education, in which all participants in the program take part, is a learning process, whose goal is the taking of responsibility by villagers of the USAID Project villages for their own health and social development.

A) Definition of "Education"

The word "education" has many meanings. To the socio-health program it is defined as follows: "education" is:

- 1) a continuous learning process, and not simply an intervention
- 2) a process that ends in action, and not in knowledge only
- 3) a process which makes available to participants the means (knowledge, skills, aptitudes, materials) to undertake action, but does not impose any specific action.

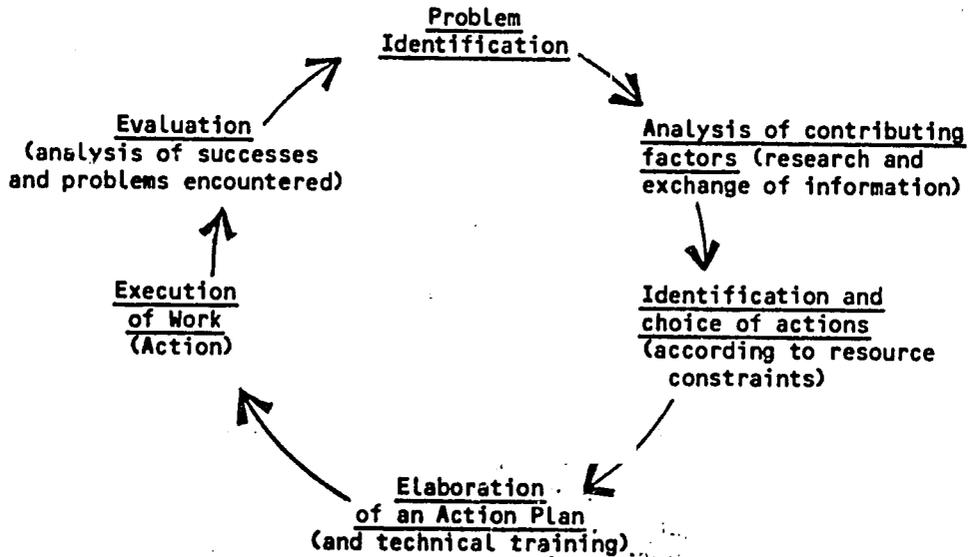
B) The Learning Cycle Process

Every activity in the socio-health program is part of the learning cycle which is at the base of the educational process in which the project participants take part. The learning cycle is a structured educational process which allows participants to resolve systematically problems from which they suffer.

The process starts each time with the definition of a problem faced by the participants in the accomplishment of the goals of the socio-health program. Next the problem is analyzed to identify those contributing factors which could impede or facilitate a solution. This analysis is first approached using the existing knowledge and experience of the participants and then using supplementary information provided by other technicians. Based on the analysis of contributing factors the group identifies several actions that could lead to a solution. Feasible actions are determined after consideration of available human, material, financial and technical resources. The next step is the development of a concrete action plan. This action plan includes detailed planning and organization of the work to be accomplished. Emphasis is placed on the formulation of concrete objectives, task analysis, attribution of responsibilities and the establishment of a schedule. During the execution phase, the participants receive the necessary technical training to accomplish the work. Every action ends in evaluation. During the evaluation the participants examine the process that they followed to resolve the identified problem in order to identify successes achieved and difficulties encountered and to infer general principles which can be applied to a more effective resolution of other problems. From this basis of experience they attack other problems.

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The learning cycle can be represented as follows:



C) Participants in the Learning Process

A key principle of our definition of health education is that it is a process of exchange of ideas between intelligent and capable adults. The roles of trainer and learner are not mutually exclusive. The systematic approach to problem resolution permits, if not obliges, all participants in the process to learn, to expand their knowledge and improve their skills. The trainers and trainees apply this same approach to all work that needs to be accomplished in the context of the socio-health program.

In order to ensure that the learning process is systematically applied every program activity is prepared at two principal levels: that of the field agents and that of the village populations with whom they work.

EXCERPT III (attached as annex III to the 6th Amendment)

A. TRAINING

Regular training will prepare field agents and villagers for project activities. Three types of training sessions are planned:

- Quarterly training to prepare participants for each successive phase of project activities;
- Technical training to prepare participants to take responsibility for action-projects;
- Planning and evaluation sessions as required.

The structures learning cycle will be followed during each training session. As often as possible, training activities will regroup participants from different villages and/or different prefectures in order to encourage the exchange of ideas and experiences.

The training sessions will vary between 1 day and two weeks in length with a estimated average duration of 2 days.

1. PROJECT PHASES AND TRAINING CYCLES

a) Project Phases

The Socio-Sanitation Program has the following eight stages:

- (1) Introduction to the Project and installation of Village Health Committees (VHC)
- (2) Introduction to training techniques and the first training session for VHC officers
- (3) Introduction to planning techniques for micro-projects and to health education activities
- (4) Introduction to management techniques for the micro-projects and continuation of health education activities, including the Health Education campaigns
- (5-8) Continuation of health education campaigns and micro-projects.

b) Levels of Training

Each project phase will begin with three levels of training:

- (1) First, project agent-trainers will be trained by Togolese and American experts (2-5 days);
- (2) Secondly, field agents will be trained by the agent-trainers. (2-3 days);
- (3) Thirdly, VHC members will be trained by the field agents (1-2 days). VHC members will then train villagers.

Trainers at each level will be assisted by higher level trainers.

In the Socio-Health Program, development extension agents will be trained as trainers capable of planning and conducting training sessions for their colleagues. These "agent-trainers" will be primarily responsible for most of the training programs beginning in 1983.

c) Contents of Training

The contents of the training will be adapted to the needs of each level of participants. However, the themes of each cycle will focus on specific questions designed to prepare participants for the planned activities.

- Cycle I : What is the Project? How should we organize ourselves to accomplish the project activities ?
(Project objectives and activities, establishment of agent teams and VHCs, project administration and methodology.)
- Cycle II : How should we prepare to better train the participants ?
("Training of Trainers", workshops for VHC officers)
- Cycle III : What are the preparatory steps for the micro-projects ?
What information do we need to plan the micro-projects ?
How can we assemble and transmit this information to the participants ?
(Planning techniques, health education techniques, identifying problems that have impact on sanitation and health.)
- Cycle IV : How should we organize ourselves for the execution of micro-projects and other activities ? What knowledge do we need to accomplish these projects ? How can we acquire and transmit this knowledge ?
(Administration and supervision of micro-projects, organization of activities, health education, technical planning.)
- Cycle V-VIII : Exactly what should we do to achieve the purpose of the education campaigns ? How can we address unforeseen problems in our work ?
(Preparation and contents of the campaigns, review of techniques already learned, methods for solving problems that have been identified.)

2. TECHNICAL TRAINING

Technical training will be geared to field agents and to villagers. Its purpose will be to train the participants in functional skills. The following technical training is foreseen:

- (1) Training of field agents and two villagers per village in pump repair and maintenance techniques. The pump installation teams will conduct the first training. The agents will be responsible for assuring the complete understanding and mastery of these techniques by the villagers during review sessions.

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- (2) Technical training for spring captation, and construction of rain harvesting systems for a limited number of agents, conducted by WASH technicians. In turn these agents will train other agents and villagers as necessary.
- (3) Technical training for gardening, poultry and small animal raising, fish farming and other techniques for micro-projects of agents and villagers, conducted by the national development services technicians.
- (4) Training in evaluation techniques for agents and participating villagers conducted by Project, USAID, and Togolese Government evaluation specialists.

3. EVALUATION AND PLANNING

In addition to planned training activities, meetings of two days or less will be scheduled as the need arises for purposes of evaluation and detailed planning activities. Such meetings may be scheduled for either agents or villagers. The main purpose of these meetings will be to resolve unforeseen problems.

B. PUBLICITY AND INFORMATION ACTIVITIES

The publicity and informative activities include:

- 1) Training activities as described above;
 - 2) Health education campaigns;
 - 3) Literacy activities;
 - 4) Activities in primary schools.
-
- 1) The Health Education Campaigns.

The Health Education campaigns comprise a series of regional activities which focus on the resolution of a number of health problems related to water usage. Each of the six proposed campaigns will have a specific theme related to the impact of water, sanitation, nutrition and medications on health. The themes will be interrelated, each reinforcing and adding to earlier topics.

For a 3 month period, each campaign will follow the structured learning cycle. Multi-media regional publicity measures (Posters, T-shirts, radio-spots, flanellographs, popular theater) will serve to focus attention on specific problems closely related to other project activities. The problems raised will serve to contrast the biological, socio-economic and environmental forces which act in a positive or negative manner on the health of a community. Based on these publicity and education activities, Village Health Committees working with the field agents will identify and implement appropriate actions to resolve these problems in their own villages.

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The six proposed campaign-themes are as follows:

1. "Enough clean Water" (The pumps as aids and obstacles to improved health): correct pump usage and maintenance, water storage, development of alternative sources.
2. "Water as a Health Help" : the use of water to clean wounds, for oral rehydration, for treatment of fevers.
3. "Water as a Health Hindrance" : fecal contamination of water (construction of latrines).
4. "Food as a Health Help or Hindrance" : child nutrition, market sanitation, hygiene of food vendors.
5. "Evaluating the Village's Health" : child growth monitoring, morbidity and mortality records.
6. - Open - to be determined according to the needs expressed by Village Health Committees.

The audio-visual materials used during the campaigns will be developed in collaboration with the field agents. Also, the exact nature of campaign activities will be determined by the agents during their preparatory training where the question: "How do we address each theme at the village level ?" will be asked.

2) Literacy Activities

The Direction of Social and Womens Affairs of the Ministry of Public Health has a functional adult literacy program in French and local languages in both project regions. Health and sanitation materials adapted for literacy training will be developed by a regional committee consisting of Social Affairs agents already working in the literacy program and by project staff. These will be edited and printed in Togo, and distributed to the literacy centers in the project villages.

3) Primary School Activities

The Togolese Ministry of Elementary Education, in collaboration with the American Peace Corps, has for several years trained teachers in the development of health education activities for their schools. In the project villages the teachers are often selected as members of the Village Health Committees. A coordination of school health activities and those of the project will take place. The proposed activities include:

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- a) the development of a "Child to Child" program;
- b) the creation by the pupils of visual aids for health education sessions;
- c) the participation of the students in village health activities;
- d) the organization of health-related puppet-shows, theater production, song-evenings, etc. by the students.

C. THE MICRO-PROJECTS

Micro-projects are short-term and low cost activities implemented at the village level to solve health problems identified by the villagers by means of a survey conducted by them. The villagers, guided by their health committees will learn a structured system to successfully complete their projects. Assisted by the field agents during a series of five meetings, they will follow a step by step process to compose a micro-project planning dossier to be submitted to a regional project approval committee.

The dossier will include:

- a) the results of the survey which identifies the village's health problems;
- b) a form detailing the forces which act on the chosen problem;
- c) a form detailing possible actions and identifying those chosen for implementation;
- d) an implementation schedule for the chosen actions.

Each micro-project will consist of several interdependent actions, including activities feasible using only materials and financial means available in the village itself (village clean-up, drainage of standing water, oral rehydration activities, primary school health activities) and activities requiring external assistance (nutrition and health education programs; construction projects: latrines, watering troughs, laundry drying areas, livestock pens, community garden; small animal husbandry and poultry projects; fish farming; village pharmacies, cisternes, spring captation).

The actual labor for the micro-projects will be done by villagers with the aid of technicians as necessary. To the extent possible the villagers will receive the necessary technical training to allow them to work independently in the future. The micro-projects will be financed by a credit, not to exceed 750,000 F CFA for three projects, which will be made available to the villagers by the Socio-Health Program. These funds are to be completed by village resources. Each micro-project must be completed in a maximum of 10 months after approval has been given. A maximum of 3 micro-projects per village is planned for the life of the project (September 1984).

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D. EVALUATION

In the context of the Socio-Health Program, "evaluation" is defined as a process of investigation which clarifies the relationship of activities completed to pre-established objectives. The purpose of evaluation is to identify the actions and/or conditions which have favored or hindered the attainment of these objectives so as to improve the planning and execution of future activities. Evaluation, therefore, does not end in judgement, but rather in a new plan of action based on the observations made during the evaluation.

1. Regular Evaluations

In the Socio-Health Program, evaluations are conducted regularly on every level. Villagers, agents, and project managers participate in evaluations after each quarterly phase of activities, each workshop, and each meeting. They are based on self-critiques and exchanges of ideas based on mutual observation among the participants. Emphasis is placed on acknowledging success in the work before analysing the problems which were encountered. These evaluations are a part of the learning cycle followed in all Program activities.

2. General Evaluations

There will also be two general evaluations of the project - one at mid-term (around March 1983) and another at the end of the Project (in September 1984). The purpose of these two evaluations is to improve the planning of future activities.

a) Mid-term evaluations

The mid-term evaluation will take place on every level of the Project with the active participation of villagers, field agents, and regional and national managers, as well as of outside observers (i.e., AIE representatives and representatives of the Togolese government). Emphasis will be placed on the evaluation inputs (commodities, project activities and project process), i.e.,

- the effectiveness of the installation and functioning of the wells;
- the effectiveness of the establishment and functioning of the Village Health Committees;
- the effectiveness and functioning of project management, including the distribution of materials;
- the existence and efficiency of systems of pump maintenance and repair at the regional and village level;
- the contents and impact of the training of village mechanics, members of the health committees and field agents;
- the frequency and impact of meetings between the agents and the villagers;
- the effectiveness of micro-project planning in the Plateaux region.

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b) Final Evaluation

Villagers, agents and project managers will assist outside observers in the final evaluation of the Project. The evaluation will study the relationship of activities carried out to project objectives and to certain project goals. (It will be too early to detect the impact on most health indicators.)

c) Sources of Data for the General Evaluations

The sources of data for the general evaluations include:

- (1) observations made by the participants in the Project during interviews,
- (2) "village notebooks" kept by the agents regarding the activities and problems encountered in each of the project villages,
- (3) monthly reports submitted by prefecture level and regional project managers,
- (4) regional and national annual reports,
- (5) training reports submitted by Project trainers,
- (6) files of hand-outs distributed to the agents to guide their work,
- (7) "base-line" research carried out at the beginning of the Project by the field agents and a medical team in a sample of 50 villages in the two Project regions. This consists of:
 - a questionnaire on water-usage,
 - a questionnaire on personal and environmental hygiene,
 - a questionnaire on health attitudes and practices,
 - a medical examination (prevalence of intestinal worms, Guinea worms, skin infection, nutritional illnesses, etc.)
 - a socio-economic survey.
- (8) observations made by the evaluators in the field.

ANNEX II A

Justification for Waiver: Togo Rural Water
Supply and Sanitation Project (693-0210)

Problem: To authorize a source/origin waiver from AID Geographic Code 000 (U.S. only) to Code 935 (Special Free World) to permit the procurement of motor vehicles of non-U.S. manufacturers.

(a) Cooperating Country	:	Togo
(b) Authorization Document	:	Project Paper amendment
(c) Project	:	Rural Water Supply and Sanitation (693-0210)
(d) Nature of Funding	:	Grant
(e) Description of Goods	:	3 station wagons, 8 pickups, 120 motorcycles - 100 cc. and replacement parts
(f) Approximate Value	:	\$200,000
(g) Probable Source	:	Togo
(h) Probable Origin	:	Japan or France

Backgrounds: The procurement of additional motor vehicles is critical to the continued success of the project. In addition to the replacement of a number of vehicles purchased under the source/origin waiver issued as part of the original project authorization, additional vehicles will be required in support of the expanded project activities under the amended authorization. A total of 2 station wagons, 4 pickups and 85 motorcycles will be purchased as replacement for vehicles originally purchased, once beyond their useful life. A total of 1 station wagon, 4 pickups (including 2 off-the-road vehicles), and 35 motorcycles will be purchased as additional vehicles in support of the expanded U.S. Technical Assistance component, Peace Corps Volunteers, and Government of Togo field agents to develop and/or construct the alternate water systems and micro-projects as well as conduct pump maintenance supervision. The project will also purchase a quantity of spare parts to support not only the new vehicles required, but also for support of repair requirements of the vehicles purchased under the original vehicle requirements.

Discussion: Section 636(i) of the Foreign Assistance Act of 1961, as amended, provides that funds made available to carry out the Act shall not be used to procure motor vehicles, including motorcycles, unless such motor vehicles are manufactured in the United States. However, AID Handbook 1, Supplement 8, Chapter 4, paragraph 4C2d, provides that the provisions of Section 636(i) may be waived when "special circumstances" exist. Such circumstances include, inter alia, the inability of a U.S. manufacturer to provide a particular type of needed vehicle, and/or a present or projected lack of spare parts or adequate service facilities for U.S. manufactured vehicles.

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In addition, under AID Handbook 1, Supp. B, Chapter 5B4, one of the criteria justifying a waiver of the authorized geographic code is that "the commodity is not available from countries or areas included in the authorized geographic code." Another criteria is that "procurement with local currency... would best promote the objective of the foreign assistance program." The authority to make such a determination and grant a waiver has been delegated to you by Africa Bureau Delegation of Authority No. 140, Revised. For a waiver to Code 935, you must also certify that exclusion of procurement from free world countries other than the cooperating country and countries included in Code 941 would seriously impede the attainment of U.S. foreign policy objectives.

Justification: No American automobile manufacturers are represented in Togo nor are American manufactured vehicles sold. Consequently, no service facilities are available to provide warranty servicing, maintenance, and spare parts support for American manufactured vehicles.

It would seriously impede the accomplishment of "the objectives of the foreign assistance program" if American vehicles are purchased in the absence of such service and supply facilities. Japanese and European vehicles, on the other hand, are being used in great number and maintenance is not a major problem throughout the country. Thus, the circumstances justify the criteria set forth above with respect to the station wagons and pick-ups. With respect to the motorcycles, none of the type desired are manufactured in the United States. U.S. manufactured motorcycles are all too large/powerful for use by the field agents in this project. The most likely origin of the small 100 cc motorcycles for this project is Japan, inasmuch as Honda, Yamaha and Suzuki units are readily available in country and can be easily maintained by licensed company representatives. Thus, the circumstances justify the criteria set forth above with respect to the motorcycles as well.

Recommendations. For the above reasons it is recommended that: (1) it be concluded that special circumstances still exist which merit a waiver of the provisions of Section 636(i) of the FAA; (2) approval be given of a source/origin waiver from AID Geographic Code 000 to Geographic Code 935 for the purchase of three station wagons, 8 pickups, 120 motorcycles and requisite replacement parts; and (3) you certify that exclusion of procurement from Free World countries other than the cooperating country, and countries included in AID Geographic Code 941 would seriously impede the attainment of U.S. foreign policy objectives and the objectives of the foreign assistance program.

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ANNEX II B

ACTION MEMORANDUM FOR THE ADMINISTRATOR

Justification for Waiver : Togo Rural Water Supply and Sanitation Project
693-0210

PROBLEM: To provide a single source waiver for a second extension of well drilling activities under an active host country contract with an American well drilling company, including an increase of funds being made available by the Project Paper amendment to the project.

DISCUSSION: (HB 11, Ch. 2.3.3A(1)) The Administrator's approval is required for an amendment to a contract between the Government of Togo (contract 17/81/DHE) and Griffin-Intrafor (an American well drilling firm) to permit the U.S. company which had originally been the successful bidder in open competition for the original 400 wells, to continue their well drilling operations beyond the present limit of 700 productive wells to up to 1,000 productive wells, within the current dollar limit authorized for this activity as provided by this project paper amendment. Extension of contractor activities in this case, constitutes negotiated procurement with a single source, and thus a waiver is required; and since the value of the procurement action exceeds \$500,000 authority to waive this requirement rests with the AID Administration and has not been redelegated.

The Project Paper and Pro Ag for this project (Togo Rural Water and Sanitation - 693-0210) earmarked \$4,950,000 of AID funds for the drilling of approximately 400 productive wells in two geographic regions of Togo (Plateaux and Savanes). A companion amount of \$2,889,000 was also allocated for improved health and sanitation practices as well as community development related to safe water in the project areas. This project paper amendment earmarks an additional \$2,135,000 for well drilling activities and an additional \$1,765,000 for health/sanitation action.

Implementation of the well drilling component of the project has been in progress since November of 1981, under a host country contract with Griffin-Intrafor, the U.S. well drilling construction company. A very favorable local currency denominated drilling rate contracted by the Togolese with Griffin-Intrafor, together with the effects of a favorable dollar/franc exchange rate of the past years, has resulted in a unit cost for well drilling which is much lower than anticipated in the project paper, and 700 productive wells should be completed with the original earmarked amount of \$4,950,000. As the result of a very positive mid-term evaluation of this project, completed in March 1983, and accompanying this project paper amendment, a recommendation was made to continue the well drilling operation beyond the present contracted limit of 700 positive wells to 1,000 positive wells, with the additional

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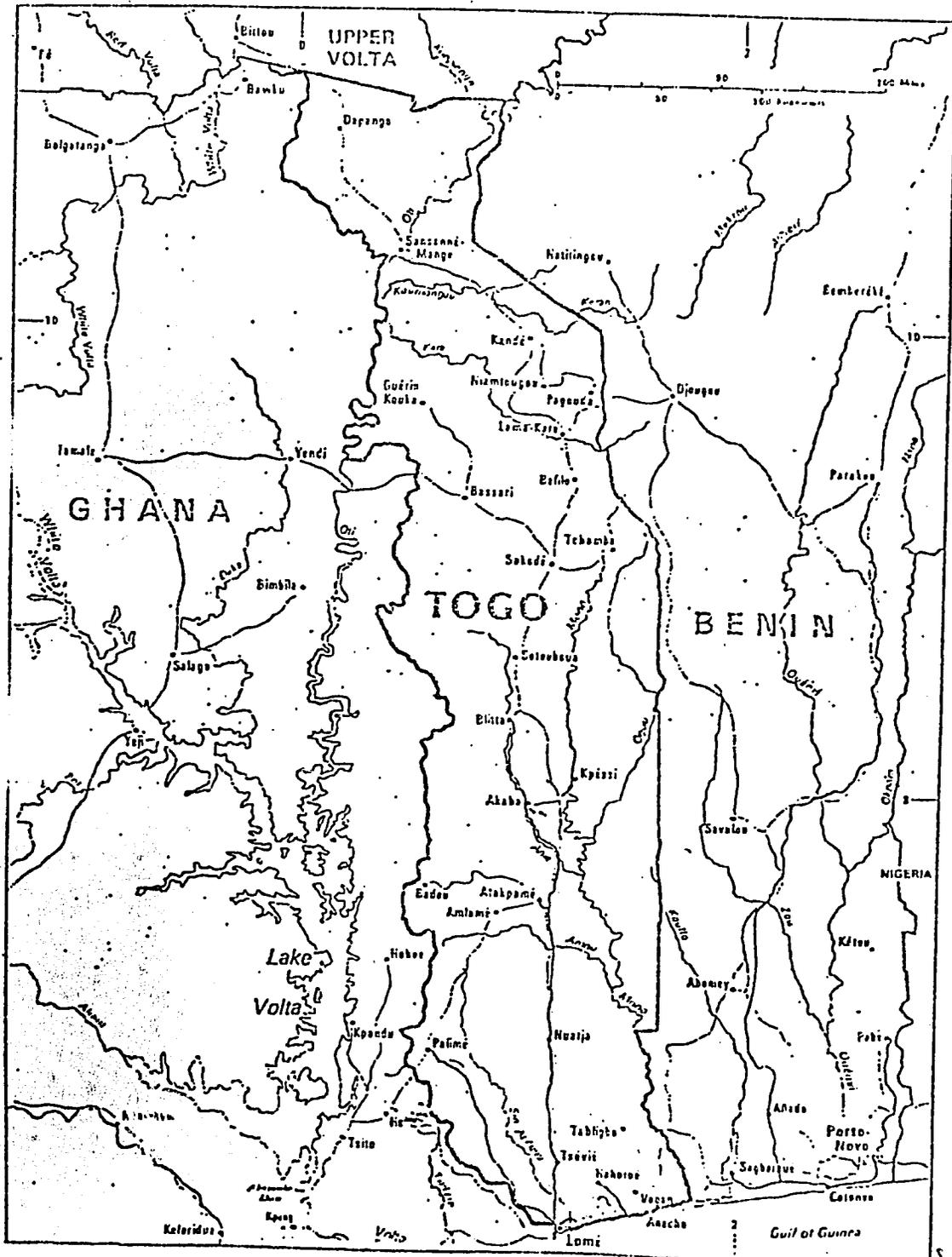
funding and authorization being made available under the project paper amendment. Use of the same U.S. drilling company presently under contract is recommended for the following reasons:

1. The performance of the current drilling contractor on this project has been excellent; i.e., the overall rate of drilling wells follows the established schedule; the drilling technology is appropriate for Togo; the construction work is of high quality;
2. The very favorable unit cost per well of the original contract would be continued by the drilling company. Even if the current per well cost could be underbid, any savings realized would be offset by the time required by another fully qualified U.S. contractor to mobilize equipment and staff and put it all on station throughout Togo;
3. As the additional drilling will be completed in a period of one year, it is thus unlikely that other fully qualified U.S. drilling firms would be interested in this short time frame activity;
4. The potential delays in seeking a contractor through the IFB process could result in a disruption of this, the most basic component of the project;
5. The driller has established close professional working relationships with the project's other donors, FAC and FED;
6. In addition to the recommendation of the evaluation, the USAID mission confirms that the Government of Togo is highly satisfied with the performance and accomplishment of the contractor and has requested the continued involvement of this firm within the project.

RECOMMENDATION: That you authorize the negotiated procurement of construction services (well drilling) from a single source as represented the extension of contractors activities under the present host country contract, and justified by the circumstances described above.

MID-TERM EVALUATION REPORT

April 15, 1983



Marigot (waterhole),
former village water source

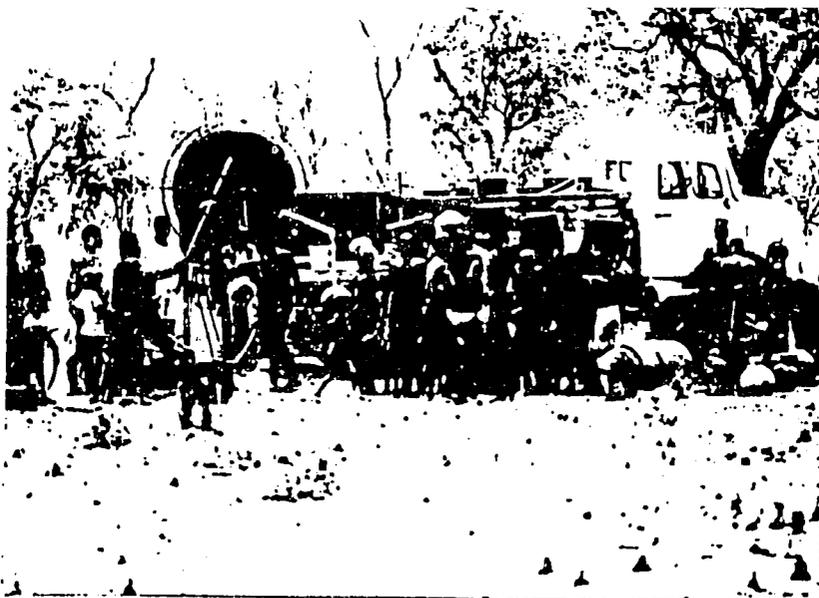


Village women collecting
water from marigot

Fetish to ward off water-seekers
from neighboring villages



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Testing yield at new pump site



Villagers lining up for water



Village girl bathing during pump test

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Enfin! L'eau potable

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ANNEXES

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GLOSSARY OF ACRONYMS AND INITIALS

APS	Agents de Promotion Sociale
BOAD	Bank for the Development of West Africa
BRGM	Bureau de Recherches Geologiques et Minières
DCD	Division of Community Development
DEH	Division of Environmental Health
DHS	Division of Hydraulic Service
DP	Directorate of Plan
FAC of France	Fonds d'Aide et de Cooperation
FED	Fonds European de Developpement
GOT	Government of Togo
LDC	Less Developed Country
MOH	Ministry of Health
MSA	Ministry of Social Affairs
MWR	Ministry of Public Works, Mines, Energy and Water Resrouces
OAR	Office of the A.I.D. Representative in Togo
PC	Peace Corps
PCV	Peace Corps Volunteer
PP	Project Paper
PSC	Personal Services Contractor

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REDSO/WCA	Regional Economic Development Services Office for West and Central Africa
SGGG	Societe General du Golfe de Guinee
USAID	United States' Agency for International Development
WASH	Water and Sanitation for Health Project
WA	West Africa
WHO	World Health Organization

EXECUTIVE SUMMARY

In line with the statement of the Government of Togo (GOT) in its Third National Development Plan that safe water for the population would be the highest development priority, and in response to a GOT request, the U.S. Agency for International Development initiated the Togo Rural Water and Sanitation Project in 1980. The multilateral project was designed to provide safe water (and the knowledge of how to use it) for 128,000 rural Togolese. As mandated in the project paper this mid-term evaluation was conducted in March, 1983 to assess current project status and make corrective recommendations to facilitate attainment of project objectives.

The project's two major components are the following:

. Drilling component.

USAID is financing the drilling of a planned 400 wells in two regions. Pump installation is the responsibility of the French Fonds d'Aide et de Cooperation (FAC). The Fonds Europeen de Developpement (FED) has financed the services of the project's hydro-geologic technical consultants (Bureau de Recherches Geologiques et Minieres, (BRGM)) and the pump maintenance program. Through February, 1983 a total of 468 wells had been drilled, of which 285 have sufficient yield to be commissioned and 157 are operational with pumps installed. The evaluation team found that the drilling component of the project has been extremely well-executed technically. Technical advice and construction supervision by BRGM has been excellent and has played a key role in the success of the project.

. Health and sanitation education component.

GOT provides most of the manpower for this component. Peace Corps has provided 10 PCVs and USAID provides the additional funding. The objective of this component is to cost effectively enhance the well project's impact on the health status of the Togolese population by providing education on correct water utilization, hygienic practices, and village sanitation. Through this component approximately 100 social promotion agents (representing the primary Togolese contribution to the project) have received special training on these subjects and on techniques of mobilizing the villagers. Using the latter skills, agents have organized health committees in the villages touched by the project. These committees are in turn responsible for educating villagers and assisting them in the identification and design of "micro-projects" which will be in part financed by USAID. The team was impressed by the effectiveness of the health and sanitation education component, particularly by the apparent competence and dedication of the social promotion agents and their collaborative relationship

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with the AID health technical consultants and Peace Corps Volunteers. However serious management problems identified by the evaluation team should receive immediate attention.

The evaluation team concludes that the drilling component of the Togo Rural Water and Sanitation project appears to be steadily progressing toward attainment of the project objectives.

The initial benefit/cost analysis that strongly supported this project underestimated its net economic benefits. The education component appears to be steadily progressing toward attainment. Continued progress of this project depends on resolution of the administrative problems described in the Management Review section. The team strongly recommends that these be addressed by project management, USAID and high level Ministry of Health officials.

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MAJOR RECOMMENDATIONS:

The following summarizes the most important recommendations offered by the evaluation team for project improvement.

1. USAID/Lome and high level Ministry of Health officials should discuss what steps to take to improve national level project management's responsiveness to the severe administrative deficiencies described in the Management Review section.
2. A financial accounting firm should be utilized to improve project financial management as well as overall project management, institute necessary controls and train project staff as needed.
3. Monthly reporting requirements should be instituted for all GOT regional level staff and the USAID technical advisors. Regularly scheduled meetings between these personnel, USAID/Lome and the National Coordinator should occur.
4. Project personnel transfers should be minimized through an AID/GOT agreement as described in the Management Review Section.
5. Project objectives for the health education component should be restated to focus on behavioral outputs rather than measurable health impacts.
6. The on-going system of data collection for project monitoring and evaluation should be refined to reflect these restated objectives.
7. In dry villages and in those with populations too large for one well, water resource surveys should be undertaken and project funds used to apply appropriate technologies to source improvements.
8. A thorough reassessment of the latrine program, including investigation of various low-cost models, should be undertaken.
9. The project scope should be expanded to include the capability of studying and implementing alternative village water systems such as gravity fed from springs, infiltration galleries, roof catchment, etc. depending on their feasibility.

10. Any continued funding for the project must be based on one pump serving no more than 250 people, or 30 liters per person per day from suitable alternative systems. This criterion must be met in existing project villages as well as new ones where it is technically feasible.
11. Steps should be taken to increase the level of participation of women in the project, both as social agents and on the village health committees.
12. The Hydraulic Service pump maintenance programs should be expanded about four-fold, placing a fully equipped technician with transportation in each prefecture instead of each region.
13. Villages should pay all maintenance, operation and depreciation costs (after an initial grace period).
14. Future wells should be concentrated near regional growth points where time and energy saved from a convenient potable water supply can be used more efficiently and productively.
15. Well drilling should continue beyond the 400 positive wells subject to availability of funds under the present contract.
16. PP amendment should be prepared to secure additional funding to continue project progress.

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EVALUATION TEAM COMPOSITION AND METHODOLOGY

A. Evaluation Team Composition

The evaluation team consisted of the following:

John Cloutier, Project Development Officer, REDSO/WCA,
(team leader)

Dr. Richard Sines, Economist, REDSO/WCA

Dr. Raymond Isley, M.D., WASH Health Consultant

Dr. Darlene Bisson, Sociologist, REDSO/WCA

Daniel Jenkins, Hydraulic Engineer, REDSO/WCA.

During three weeks of field work in Togo the team worked closely and continuously with the following project personnel:

Ouro Bawinay-Tchatomby, National Coordinator

Paul Guild, USAID Project Officer

Agma Prins, Technical Advisor

Sarah Fry, Technical Advisor.

The evaluation team also wished to express its appreciation to Gafarou Osseni of the Hydraulic Service, Michel le Joncour of BRGM and all the regional personnel and agents who greatly facilitated the team's work. Finally, the evaluation team expresses its sincere appreciation to Jutta Lausen of USAID/Lome for her helpful efforts during the evaluation.

B. Evaluation Methodology and General Approach

This midproject evaluation has involved:

1. The study of documents, technical papers, and correspondence related to the Togolese rural water project and the general literature on rural water systems.

2. Discussions with representative individuals and groups at all levels of the program: (a) the drilling, installation and maintenance of the pumps; and (b) the delivery of public health education services. Other persons knowledgeable of the program or its economic, political and social environment were also interviewed

3. Field visits to study the pump installation process and the health education program centered around the newly installed pumps. Villages were chosen with the help of project personnel to obtain a broad view of all activities and to visit the whole spectrum of villages covered by the program.

(a) First, the team visited villages at each stage of the pump installation process. The site generally was determined by where each different activity (i.e., drilling, testing, installing, etc.) was occurring on the day the evaluation team was in the region. The evaluation team visited sites where:

- no pump operations were underway;
- drilling was taking place;
- well was being tested for yield;
- cement encasements (aprons) were being built;
- pumps were being installed and village pump repairers were being trained in simple maintenance techniques;
- pumps had been recently installed; and
- pumps had been installed for a longer time (up to 9 months);

(b) Criterion Two was to choose a wide variety of villages participating in the health education program. At the time of the evaluation, this was limited to the Plateau region since the health program had barely begun in the Savannah region. The team visited "dry" villages^{1/} and villages with a pump; villages where a pump was working well

^{1/} Villages where the drilling teams did not find sufficient water pressure to install a pump.

and where it was working inefficiently or not at all; small villages (less than 350 inhabitants) and larger villages (more than 350 inhabitants); villages where the health program has been in operation for almost a year and villages where the health program was just beginning; and villages with pumps that still had adequate water supplies and those where available water was still inadequate due to large village size;

- (c) Criterion Three was to visit villages with alternate sources of water that might provide a more cost effective water supply.

In meeting these three criteria, the team visited both major regions: the hot and dry Savannah and the slightly less harsh Plateau regions. At the time of the evaluation, all new drilling was taking place in the Savannah region. Most health education activity (which relies heavily on the existence of a convenient source of potable water) was in the Plateau region, where most pump installation (i.e., up to the time of the evaluation) had taken place.

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C. Specific Evaluation Procedures

In addition to general observation and exchange of ideas, management efficiency was examined through a series of one-on-one interviews with all principle management staff and a representative selection of persons involved in both health education and the pump installation program.

In order to assess the functioning of the village health committees and the influence of the social promotion agents on village-level activities, a series of pre-arranged meetings with the health committees in nine different villages selected from all five prefectures of the Plateaux region was held. A list of the villages is found in Annex VA. With one exception, all the meetings were attended by a large number of other villagers and participation in the discussions tended to be general. So as to provoke discussion, a series of questions was asked (see Annex IIB).

To examine the project's functioning at the level of the social promotion agents and their supervisors (chief secteurs), a series of interviews was conducted with 16 agents and 4 supervisors; the latter also performed the work of social promotion agents. A series of questions (see Annex A) was posed in interviews of 1 1/2-2 hours. Some were one-on-one interviews and several were conducted with groups of 2-5 agents. In the groups, the interviews also noted the agents' interactions and opinions expressed among themselves.^{1/}

Discussions at all levels took place often on-site with personnel involved in the technical and engineering aspects of the project: drilling site selection; pump installation criteria; and pump installation techniques, operation, and maintenance; etc.

No formal economic evaluation plan was adopted. A short time frame prevented obtaining adequate economic data. Data was studied from the Togolese Rural Health Program; project reports by USAID, the World Bank, WHO, etc.; and related academic and practical literature on rural water systems. Field visits included talks with villagers, transporters, small and large traders, and others knowledgeable of the Togolese economic structure. These discussions enabled a cross verification of existing but scarce data found in the various reports.

^{1/} The results and recommendations of interviews with village health committees, social promotion agents and supervisors appear in the sections on technical analysis (part 2) and health and social aspects (part 2).

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QUARTERLY IMPLEMENTATION REPORT

A. ADMINISTRATIVE DATA

1. Date of this Sheet: 31 Dec. 1982
2. Field Project Officer: Paul Guild
3. AID/W Backstop Officer: AFR/DR: Speers
4. Implementing Agent: Min. of Public Health & Social Affairs, Min. PUBLIC WORKS - AID - Peace Corps - FED - FEC
5. Country/Region: TOGO
6. Project Title: TOGO RURAL WATER SUPPLY AND SANITATION
7. Project No: 693-0210

B. FINANCIAL DATA (\$000)

8. Type of Funding: Grant (ARDN) bilateral
9. Life of Project Auth: 7,839
10. Oblig-Cum. Proj. to Date: 7,140
11. Date of Initial Oblig: 8/80
12. FACD: Sept. 1984
13. Expend-Cum. Proj. to Date: 2,633

C. PROJECT PROGRESS AND STATUS

14. Project Purposes:
To improve the health and living condition of 128,000 rural persons living in two regions of Togo by drilling 535 tube wells equipping approx. 400 with pumps and by providing a complementary health education, village sanitation community development component.
15. Conformance of Project Activities with the Implementation Schedule in the Project Paper and Progress Towards Achieving Project Purposes Since Last Report for Major Project Inputs:
To date more than 80% of the planned boreholes have been drilled which is ahead of the implementation schedule. 60% are positive which is under the PP planned 75%. Positive wells are being equipped with pumps on schedule. Training of Social Affairs and Min. of Health Staff continues as planned.
16. Essential Actions Planned next 90 days: and Primary Action Agents:
A. Amend G.A. to conform with PP calling for 400 productive wells and amend contract accordingly, amend PIL budget, obligate dols 600,000, sign sanitation implementation plan. AID/GOT
- B. Complete project in-progress evaluation. Plans for eval. team arrival/deployment completed
17. Major Issues Requiring Resolution: and Primary Action Agents:
Delay of RLA concurrence with G.A. Amend. # 6 OAR/REDSO
- 10

PROJECT DESCRIPTION

A. Introduction

In its Third National Development Plan the Government of Togo (GOT) identified the provision of potable water to be the top priority for 1976-1980. To attain this goal the GOT sought the assistance of several donors, including the U.S. Agency for International Development. The Togo Rural Water Supply and Sanitation Project was implemented by USAID in response to this request. Its purpose is twofold:

- First, the project is to provide safe drinking water for approximately 128,000 rural poor, primarily through the drilling of 400 tube wells.
- Second, recognizing that health benefits are not automatically realized with the simple installation of wells, the project included a health education and sanitation component, focusing on training of social promotion agents and mobilization of villages.

B. The Project Setting

Togo is a small and poor country with an area of 56,500 kilometers and a population estimated at 2.8 million in 1982.^{1/} Togo shares the social and economic characteristics of the developing countries of West Africa: low GNP per capita (\$410), rapid population growth (2.9% annual rate of natural increase), high infant mortality (109 per 1000 live births) and low life expectancy (46 years).

Although many factors account for the poor health status of the Togolese population, lack of access to safe water is a major contributor. In 1975, the World Bank estimated that only 16% of the population had a safe water source. A variety of diseases are associated with unsafe water: diarrhea and dysentery, intestinal parasites, schistosomiasis, onchocerciasis, Guinea worm and, indirectly, malaria. The high incidence of these diseases leads not only to high infant, child, and adult mortality, but to decreases in labor productivity due to morbidity.

The water situation in Togo is acute in the rural regions (where 83% of the population live) and particularly in the Sahel-like areas of Northern Togo. Because water is essential to life, rural people are forced to walk, often many miles, to draw water from polluted sources. During periods of drought (such as that being experienced in early 1983) even contaminated water may be in short supply.

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The Togo Rural Water and Sanitation Project addresses this crucial need for water. As it focuses on the rural areas, the project's potential beneficiaries are those who suffer the most severe water deprivation and negative health impacts. Through its well-drilling and accompanying health/sanitation education component, the project seeks to improve the health status, productivity, and general living conditions of the Togolese rural population.

C. The Project

In early 1977, the AID officer opened discussions with GOT officials regarding a rural water project. Discussions continued for over a year and a team of technicians was sent from USAID in Washington to Togo in 1978 to conduct preliminary project design work. A number of donors were involved, and multilateral discussions were held. After the approval of the Project Paper, USAID's participation began in 1980. The roles of the various donors were as follows:

Fonds d'Aide et de Cooperation (FAC) was to provide \$0.75 million for purchase and installation of pumps. Fonds Europeen de Developpement (FED) was to provide \$0.8 million for maintenance of all project pumps through 1983 and to finance the management services of the Bureau de Recherches Geologiques et Minieres (BRGM). USAID's contribution was to be \$7.8 million, to provide drilling and finance the health education/sanitation component. In addition, the U.S. government was to provide the services of Peace Corps volunteers. The GOT was to provide the equivalent of \$955,000, principally in salaries of government employees assigned full or part-time to the project.

Due to the need to co-ordinate with rural water projects funded by other donors, USAID was asked to concentrate its project activities on the northernmost Savannah region (150 wells) and the Plateau region (250 wells), just north of the coastal region.

Drilling activities, under the direction of BRGM, got underway in the Plateau region in November 1981. Before drilling could begin, regional committees in Savannah and Plateau, consisting of the prefets and regional representatives of various ministries, were asked to draw up lists of 150 and 250 villages, respectively. These became the lists upon which drilling was begun in the Plateau region.

1/ Source for the following data, except where noted, is 1982 World Population Data Sheet of the Population Reference Bureau.

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The definitive list of villages in the Plateau region differed somewhat from the original list submitted by the regional committee for several reasons. Early on, the drilling team encountered geologic difficulties in some of the villages. In these cases they replaced these with neighboring villages. Unfortunately, USAID personnel working on the health/sanitation component were not always aware of the changes. Thus, some villages were mobilized and did not end up receiving wells. Additional deviations from the original list occurred because of changes desired by local political authorities for various reasons.

Thus, during the early phases in the Plateau region, the project suffered somewhat from a lack of coordination between the drilling team and the health/sanitation personnel. This resulted in a number of disgruntled villages and some ill feeling among authorities and personnel. Fortunately, all seem to have learned from the Plateau experience. As drilling now takes place in the Savannah region, steps have been taken to avoid similar problems. To date, these appear to be successful.

As described above, BRGM has been responsible for supervising drilling activities and appears to have been highly effective in carrying out these tasks. The health and sanitation education component has been the responsibility of two health education specialists on Personal Services Contracts to USAID, one since September 1981 and a second since early 1982. A Togolese national co-ordinator was also appointed. In addition, Peace Corps has come to play a vital role in this project component, for the past two years in the Plateau region and since mid-1982 in the north. A total of nine exceptionally competent volunteers currently work full-time as counterparts to the social promotion agents and/or the agents' supervisors.

The major aspects of the health and sanitation component of the project are the following:

- Training of Togolese social promotion agents. These are trained social workers provided by two divisions of the GOT Ministère de la Santé (Affaires Sociales and Assainissement). Specialized training is given by the two project PSC's and Togolese collaborators, on general management skills and specific aspects of project implementation.

Organization of village health committees. Social promotion agents learn how to do this during their training. They then organize committees of 10-12 members in each village for which they are responsible (the number of villages varies from 3-20). The committees are then responsible, with the agents, for educating the villages on proper water utilization and hygiene practices and for mobilizing them to conduct various "micro-projects" which they themselves will identify and implement with additional USAID financed funds and village contributions.

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D. Achievements

Since its inception the project has moved steadily toward attainment of its stated objectives. The major achievements through March, 1983, are as follows:

- Over 157 working wells have been completed, providing water for approximately 47 thousand rural Togoese;
- Approximately 100 social promotion agents have received special training for the project and are actively working in the field;
- Village health committees have been organized in all affected villages (including dry villages);
- Village health committees, working with the agents, have mobilized their villages to conduct various activities including village clean-up, disease prevention, and fund-raising for pump maintenance.

In the immediate future, project activities are to include:

- Continuation of drilling in the Savannah region. Due to an unanticipated favorable change in the exchange rate since the project was budgeted, an estimated and lower than expected drilling costs, more wells will be drilled than what was originally planned;
- Continued training of social promotion agents and work with village health committees;
- Launching of the micro-projects which villages have been discussing during the past months.
- Initiation of a region-wide health education campaign in the Plateau.



MANAGEMENT REVIEW

The evaluation team concluded that the project is weakest in the area of administrative and managerial performance. The major difficulties identified from interviews at all levels of project implementation and from document review included insufficient financial management procedures, excessive personnel transfers, insufficient staffing in certain prefectures, infrequent reporting by GOT and U.S. project personnel and organizational flaws at the top of the hierarchical structure. These problems and others have resulted in poor communication and coordination between national level project officials and subordinates in the Dapango and Atakpame areas. (Management of technical inputs from the Hydraulic Service and BRGM was found to be very good and is discussed in the Engineering Analysis and Annex.)

A. Financial Management

A review of the accounting procedures in effect in the Savannah and Plateau regions as well as project headquarters in Lome indicates severe control deficiencies. Accurate inventories of project assets are not maintained, many basic accounting ledgers simply do not exist and control over the petty cash fund of one million CFA in Lome is not adequate. Regular small purchases which should be paid from the petty cash fund remain unreimbursed for months partly because of the liquidity problem resulting from having over two thirds of this fund lent out for personal advances. If this project is to administer over one million dollars in local currency for village level activities and other CFA expenditures in a manner consistent with the criteria for certification of host country accounting systems per Section 121 (d) of the 1981 Foreign Assistance Act, it is essential that project financial management be greatly strengthened. Therefore the evaluation team strongly recommends that short-term and periodic financial management technical assistance be secured from an accounting firm with offices in West Africa and preferably with some familiarity with USAID control procedures.

The purpose of the accounting firm's initial involvement would be to install a simple, timely and reasonably accurate management reporting and monitoring system. This would also entail assistance in financial staff recruitment and training as well as financial management training aimed at project decisionmakers whose primary responsibilities are nonfinancial. The system should provide adequate internal control for cash flows, account balances, property, and financial reporting and eventually yield budget expenditure estimates with identification of significant cost variances. Quarterly reports should be submitted to USAID describing the status of the system and an assessment of project

management progress in attaining organizational and managerial objectives as described in the accounting firm's scope of work and project documents. An annual audit should be performed with special emphasis on effectiveness of internal controls, implementation of recommendations in previous reports, financial statement assessment and variations in input utilization. Finally, during each quarterly report to USAID, the firm should assess the progress made in implementing the recommendations proposed in this evaluation report. Thus the role of the accounting firm is to ensure adequate project financial accountability and provide useful project monitoring information for managerial level officials. A sample scope of work for such a professional engagement, not necessarily tailored to this project, is provided in Management Review Annex A. (See Annex B for a summary of USAID expenditures).

B. Administrative Issues

Comments made during interviews conducted by the evaluation team invariably involved issues related to project management efficiency. Management concerns were expressed by interviewees at both lower and middle levels of project administration. The following summarizes concerns of lower level management personnel (agents and their immediate supervisors) as expressed to evaluation team members:

. Difficulty in obtaining funds for their transportation. Most frequently mentioned was the delay in receiving gasoline coupons and/or money. Agents frequently are forced to advance money from their own pockets for fuel and/or vehicle repairs and complain of several months delays for reimbursement of such expenses. In periods of gasoline shortage, agents report having to "negotiate" with dealers; not having cash available makes their position more difficult.

. Perceived inequities in per diem and supplier allocated to agents. In addition to logistical and bureaucratic difficulties involved in obtaining per diem, agents feel the system is not fairly administered, as there is variation among the amounts received. Hard feelings also arise because some agents are provided motorcycles while others must rely on public transportation.

. Highly centralized financial management of the project. Many agents feel the problems described above are related to over-centralization of the project's financial management. Clearance for even minor expenditures must come from the national coordinator. Several suggested the establishment of regional petty cash funds to facilitate cash flow.

. Frequent reassignment of agents among regions. Unexpected personnel changes were felt to affect negatively the morale of agents, as well as detracting from their effectiveness in the field. Agents feel it is disruptive for one of them to be "affectee" to another region after having been trained and having gained the confidence of villagers in a particular region.

. Procurement of spare parts for motorcycles is too slow. Agents report being on "waiting lists" for spare parts for many months even though the parts are readily available.

. Agents are aware of project management inaction which has resulted in about 15 badly needed motorcycles being kept in storage in Lome and Atakpame for several months instead of being distributed to project personnel.

. The USAID project technical advisors are often forced to be involved with administrative issues at the expense of frequent visits to the field.

. A summary of concerns and desired recommendations prepared by the USAID technical advisers as presented to the evaluation team shortly after its arrival in Togo appears as Management Review Annex C. Comments and concerns of all other project personnel above the levels of agents and chef-secteurs are summarized below:

- . Advisory committees on the regional and national levels often attempt to exercise direct control over project activities.
- . In several instances the Director General for Social Affairs vetoed project related travel to Lome by regional personnel. (See project organization Chart 1 in following section).
- . USAID technical advisers spend too much time in Lome. Even the Atakpame based technical adviser spends the majority of her time outside of the Atakpame area.
- . A third technical adviser is needed, preferably based in Dapango.
- . A turnaround time of several months for per diem and small expense reimbursement from project headquarters in Lome is inexplicable and adversely impacting on employee morale and productivity. For example, gas receipts turned in March, 1982 were finally paid in November, 1982.

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- . The project lacks a vehicle maintenance policy.
- . The creation of a National Coordinator position with full-time project responsibilities did not enhance project independence. The project is basically under the control of the Director General of Social Affairs.
- . Top level project management in Lome regards USAID's policy of not paying "indemnities" as a disincentive.
- . USAID's financial management requirements are not clear to project managers.
- . Disagreements and clashes between the National Coordinator and the Technical Advisers are disruptive to project progress.
- . Transportation, particularly for training participants, is inadequate.
- . Agents are transferred without input from regional project managers.

Many of the projects' administrative deficiencies result from inconsistent implementation of existing procedures. For example, the per diem (paid with USAID funds) policy was formalized in a letter dated April 15, 1982 from the Acting USAID Representative to the Minister of Planning and Finance. The policy was based on the Togolaise government per diem system whereby different levels of project officials receive their respective per diem compensation.

In the opinion of the evaluation team, the persistent complaining about per diem stems from national level project management's failure to adequately inform project personnel of the existing policy and to consistently implement that policy on a timely basis. The gasoline allocation problem would be alleviated if the regional office would receive coupons or reimbursement for gasoline purchases from national headquarters in sufficient quantity and on a timely basis. Present delays with per diem and gasoline do not result from a shortage of USAID financed project funds.

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C. Project Reporting and Communication

The lack of an institutionalized reporting system for both GOT and US personnel makes monitoring project activities more difficult and has resulted in a significant lack of documentation from which to assess and summarize project status. Even in instances where personnel were sent on international travel at project expense, no documents describing the purpose and results of the travel were required.

The evaluation team recommends that all project staff at or above the regional level prepare monthly activity reports for their supervisors. Reports should generally not exceed two pages in length. The National Coordinator should submit his report to the Chef du Cabinet with copies to USAID and the President of the National Committee. USAID technical advisors should submit their monthly activity reports to USAID with a copy to the National Coordinator. Although the monthly reports need not be exhaustive they should summarize travel performed, problems encountered, elaborate on concerns and describe major work tasks.

Due to a lack of documentation the evaluation team was not able to judge the effectiveness of some project activity. For example, the Atakpame based technical advisor spent over 110 days from September, 1982 to February, 1983 outside of the Plateau region. Much of this time was spent in Lome, but no reports exist from which to judge the appropriateness or even the purpose of much of this travel. Also monthly reports by regional staff will document the administrative problems described in the previous section as well as progress made toward their resolution.

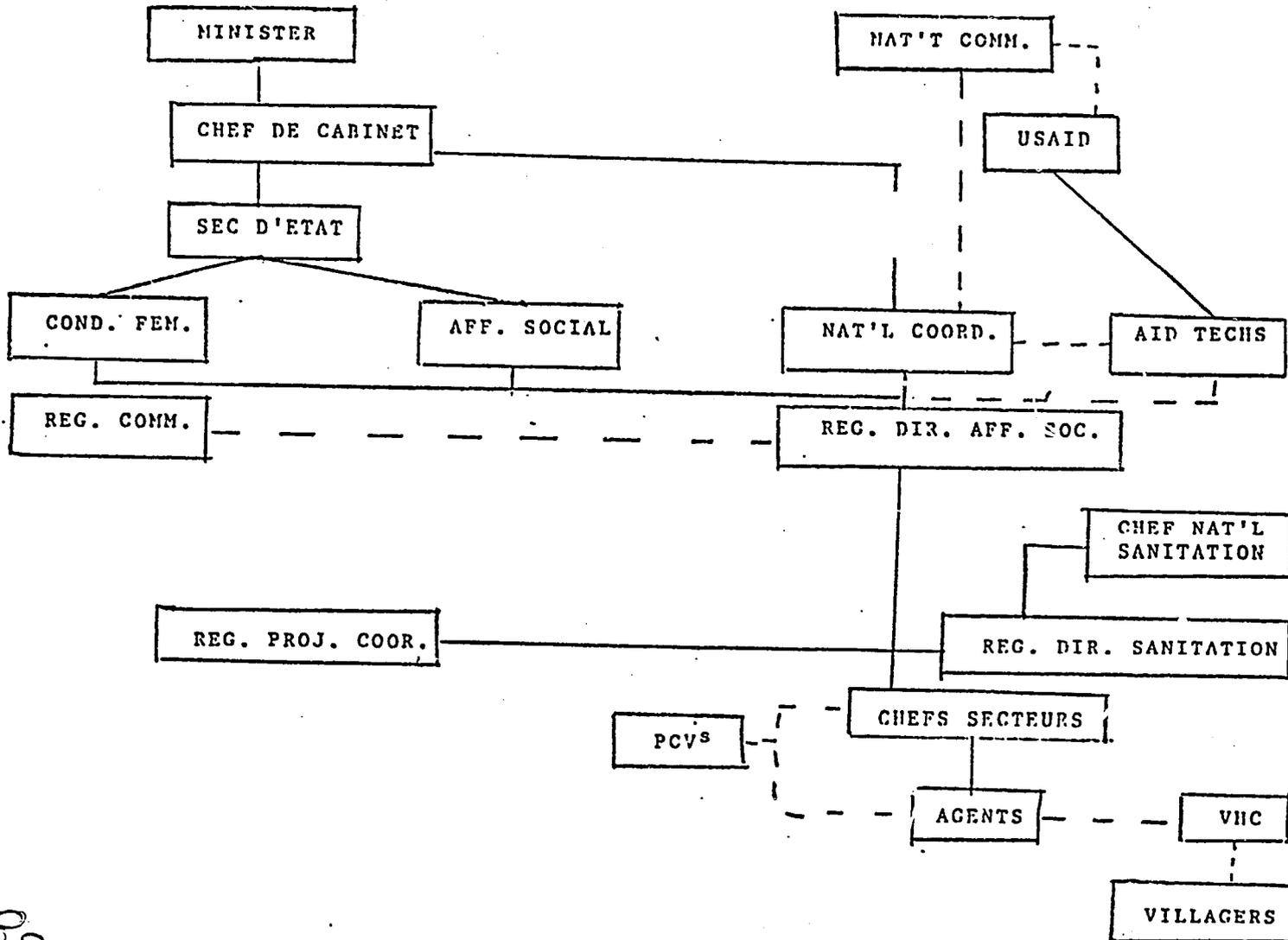
Besides written reports, project communication can be strengthened through more frequent meetings in Lome between Regional Directors, USAID technical advisors, national project management and the USAID project manager. Such meetings, perhaps on a quarterly or bimonthly basis, will help to emphasize the effects of administrative problems on field staff and in general facilitate communication. When the National Coordinator and counterpart, the Lome based technical advisor, visit regional offices, meetings with regional and some lower-level staff should be used as working sessions to discuss project problems and concerns rather than just being of a perfunctory nature.

D. Organizational Structure

Chart 1 illustrates project organization as it fits into the Ministry of Health. Difficulties inherent in this structure are described below.

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Chart 1
PROJECT ORGANIZATION



Solid Line - flow of authority



Villagers are organized by village health committees who are in turn trained and organized by agents from Social Affairs and/or Sanitation. (See Health and Social Analysis.) Peace Corps Volunteers usually function as counterparts to agents and Chef-Secteurs but were reluctant to be perceived as agent supervisors. Each Regional Project Coordinator has a Peace Corps counterpart who assists with the monitoring of agent activity, training and regional administrative duties. In the ministry hierarchy, the Regional Directors of Social Affairs and of Sanitation are equals. Each supervises a staff of agents. In the project organization, however, the Regional Director of Social Affairs is the highest ranking regional official. The Regional Director of Sanitation is a subordinate who also reports to the National Chief of Sanitation. With each Regional Director supervising some agents who work full-time on project activities and others who are part-time, it is often difficult for them to separate project from nonproject items for reporting purposes. Also "nonproject" directives by any superior usually impact on the project. Potential disharmony in project organization has been averted in both the Savannah and Plateau regions by exceptionally smooth working relationships between Regional Directors and members of both agent groups working closely together, usually in teams.

A more difficult problem is encountered as one reviews the "chain of command" from the Regional Directors of Social Affairs to national level project management. The National Coordinator was intended to be an autonomous, full-time project position reporting to a sub-minister level. The position was established in response to an OAR/Lome request to the Minister of Health in a letter dated October 22, 1982 (See Management Review Annex D). Reviewing the organization chart one notes that the Regional Directors are each directly responsible to three superiors: the Directors General of Condition Feminine and Social Affairs for "non-project" business and to the National Coordinator for all "project" related concerns. The Regional Directors each spend about 80 to 90 percent of their time on project related activities, although they emphasize that project and nonproject activities are often either nonseparable or interdependent. Given the Director Generals' direct line authority over the Regional Directors, the apparent "independence" of the project within the ministry is illusory.

The present National Coordinator was elevated from the Regional Director position in Kara in November, 1982 and enjoys a close professional and personal relationship with the Director General for Social Affairs. Such a close relationship can help to overcome the organizational contradiction described above and enhance project administration if both individuals are dedicated to attaining project objectives and are responsive to the administrative and logistical needs of regional and field staff. However, it appears that the National Coordinator only acts in coordination or with the permission of the Director General for Social Affairs. Thus, establishment of the former position to enhance project administration is not effective.

E. Personnel Transfers:

During the evaluation team's three weeks in Togo, several project employees were transferred from their positions. Agents from areas of the Plateau region already suffering from personnel shortages were reassigned to non-project positions both inside and outside the region. Other personnel were reassigned to positions within the project. As the evaluation team began its field work, the Plateau Regional Director for Social Affairs, the highest ranking project official in that province was reassigned as a chef de secteur with no explanation. There seems to be little justification for many of these transfers which were perceived as unfair to the individuals involved, some of whom were unexpectedly "promoted" to higher level positions outside the project despite their obvious dedication to the project. The effect of these sudden and frequent personnel transfers is disruptive and appears to be contrary to project progress.

In an interview with the team leader and team Social Scientist the Director General of Social Affairs stated that all personnel changes are carefully thought out by his office and calculated so as to be whenever possible in the best interests of the project. His perception of such changes is that they are not impeding project progress. The National Coordinator expressed a similar acceptance of these frequent project personnel changes. Given the disruption caused in the regional offices and the field by these personnel transfers and the devastating impact on project morale at all levels, the evaluation team concludes that national level project management is not sufficiently sensitive to the impact of personnel changes.

The evaluation team recommends that USAID and the Ministry of Health discuss means of alleviating this problem. The following possibilities should be considered: (1) an USAID/GOT agreement whereby all GOT project personnel are assigned to the project for a period of two or three years or remaining life of project duration, whichever is less. (2) An USAID concurrence system for all critical personnel changes. (3) Notification to USAID of all planned personnel moves well in advance, perhaps 90 days.

F. Other Issues:

The role of Peace Corps volunteers has primarily been to act as counterparts to agents and/or their immediate supervisors. After interviewing agents and other project personnel it is clear that the Peace Corps contribution has been invaluable. In the Plateau at least four PCV's will be terminating on schedule during the next three months. Given the progress made in training the field agents, all project personnel, including the Peace Corps volunteers themselves, agree that the Peace Corps component of the project

should evolve as the emphasis moves from well drilling and organizing village health committees to the commencement of micro-projects. Thus volunteers who can train agents and villagers in micro-project skills such as small construction and gardening will be needed. Also, two volunteers with management and accounting experience to work with regional managers would complement the role of the accounting firm and help lay the groundwork for adequate controls over micro-project financing.

As the level of project activity increases in the Savannah region, there will be a growing need for continuous assistance by a technical advisor. Presently trips are made to Dapango by the technical advisors who already have full-time responsibilities in Lome and Atakpame. The evaluation team found unanimous agreement among project staff that a third USAID technical advisor, based in Dapango, (perhaps with a background in construction and with public health experience) would strengthen the project's health component and complement the work of the other technical advisors. Given the large uncommitted USAID fund balance a third technical advisor can be financed from current funds.

Conclusion:

Based on extensive interviews with project personnel at all levels, the evaluation team is concerned about the impact of administrative inefficiencies (delays in expense reimbursement, per diem, gasoline, etc.) on regional and field staff. Even more disconcerting is the failure of national level project management to comprehend the magnitude of the problem and the necessity of addressing it immediately. The involvement of an accounting firm or other external inputs cannot in themselves resolve all the management difficulties described in this report. Unless project management addresses the administrative problems adversely impacting on project staff and performance, the future of the health component is in jeopardy. Therefore the evaluation team strongly recommends that the USAID Representative and high-level Ministry of Health officials discuss the management concerns presented in this document and jointly take whatever action is necessary to strengthen national level project management's responsiveness to regional and field staff needs.

HEALTH AND SOCIAL ANALYSIS

Introduction

Key components of USAID's participation in the rural water project are the health education and sanitation components. The original project document established goals in these areas and proposed methods for attaining them. As the project has evolved, several changes have occurred which should be recognized in a reconsideration of the project's health and social objectives.

The project document correctly recognized that the placing of wells is an environmental modification which can be related to improvements in health status. Yet in setting project objectives too little attention was given to the need to bring about behavioral changes. A restatement of project objectives should recognize that these, rather than measurable changes in health indicators, will be the major outputs of the health and sanitation component of the project. It is unrealistic, and would do an injustice to the project, to expect that even in the middle-term (10-15 years) health indicators such as infant/child mortality would be affected by the installation of wells. With the exception of perhaps Guinea worm, directly and solely water-related, few measurable health status changes can be expected. Thus, project objectives should be restated to reflect the hoped for, and quite likely to be attained behavioral changes: acquisition of organizational skills by agents and villagers, introduction and reinforcement of improved health and hygiene practices, acceptance of the notion of preventive medicine, and the like.

One other deviation from the original project document should be noted and taken into consideration in restating project goals. As originally conceived in this project, latrines constructed in all project villages were to have constituted the main health input. Appropriate health education was to have accompanied their construction. As a result of the insistence of Togolese sanitation authorities, the only latrine model acceptable is one in which the pit is completely lined and the slab is cement and the superstructure also in durable materials. The cost of this model is about \$400. At this cost, not more than one or two per village are possible. Public latrines at schools, dispensaries or in other locations among the populations represent consequently the only choice. This approach is of course totally unacceptable. Public latrines are relatively unknown to rural African populations and there are multiplied hundreds of examples of extremely poorly maintained pit latrines in schools, markets and health centers. Private latrines, one per household, preferably two or more for men, women, and small children, are much to be preferred.

Four hundred dollars exceeds of course the ability of the average householder to pay for a latrine. Besides, having a latrine is not the only answer to the control of environmentally related diseases. For

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these reasons, a broader based health component has been adopted, with latrine construction still a viable part but with other approaches and techniques playing important roles.

This shift in emphasis is applauded by the evaluation team as more appropriate to the population's needs, perceptions and ability to absorb inputs than the imposition of a single expensive technology. Essentially, villages are asked to name their perceived health priorities and to analyze effective approaches to prevention and treatment. Latrine construction is still a part of the proposed programs of several villages. Less expensive and perhaps more culturally and technically appropriate models, however, need to be identified, tested, and adapted to local circumstances.

In the following sections the health and social aspects of the project are discussed in detail. These analyses focus on the two major levels at which health and social activities have taken place: the level of social promotion agents and the level of the villages. Conclusions and recommendations based on these findings appear at the end of this section.

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A. Social Agent Level Analysis

In a sense, the social promotion and sanitation agents are the backbone of the project. They serve as the liaison between USAID and Togolese project personnel and the villagers, with whom they work through the village health committees. The agents, once trained by USAID health specialists and Togolese counterparts, are responsible for the mobilization of villages through establishing and training village health committees.

The social promotion agents represent the major Togolese contribution to the project. They include virtually all the field agents in the Savannah and Plateau regions from two divisions of the Ministry of Health: Social Affairs and Sanitation. Working on the project is the major activity of these personnel. All have been trained at the national school for social workers (agents de promotion sociale) before being assigned to the field. Since the beginning of the USAID project, approximately 100 social promotion agents have received special training for the project.

Figure 1 presents a partial organization chart of the project, indicating the position of the social agents. Several comments should be made regarding this figure. Arrows are double-headed to indicate that these relationships are more collaborative than hierarchical. Although chefs de secteurs (from Affaires Sociales) and sanitation agents (from Assainissement) are the supervisors of the social promotion (field) agents, in practice they also perform most of the functions of the latter, visiting the field and sharing responsibility for villages. Likewise, the team was struck by the close collaborative relationship between the Peace Corps Volunteers and the field agents. The PCV's assigned to the project are exceptionally dedicated and competent, and appear to have the complete confidence of the agents and villagers.

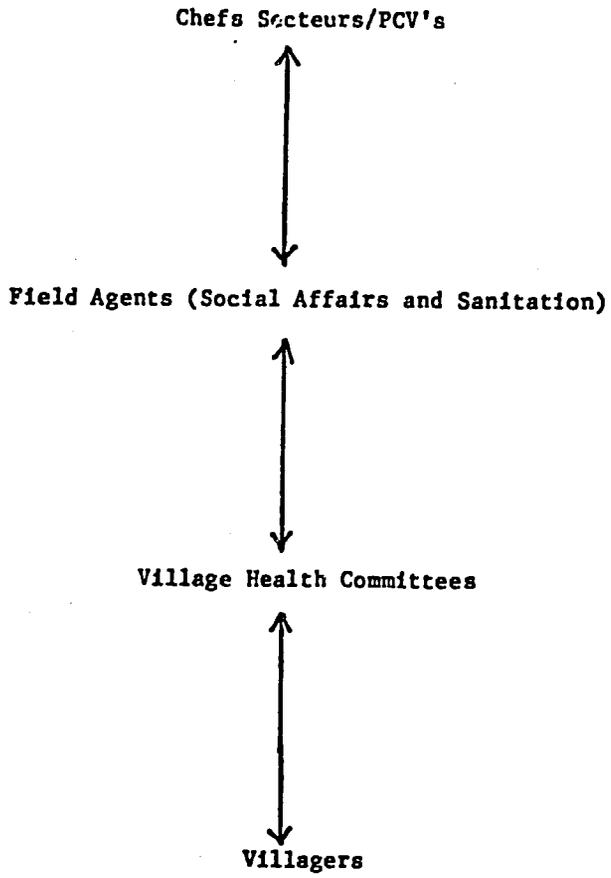
In the following pages, results of interviews conducted in the field with field agents and supervisors are reported. These focus on two main areas: training and work in the field. The latter includes a discussion of several management-related issues which have an impact on the work of the field agents. A copy of the protocol used for the interviews appears in Annex A.

1. Training. As mentioned above, all social promotion agents are graduates of the national school of social work. For their work on the project, they have received special on-going training on various aspects of project implementation. Initially, the two PSC health specialists on the USAID project trained the chef de secteurs and sanitation agents. This included teaching them how to train field agents, which they then did in turn. In general, training is in the form of periodic seminars of 3 to 5 days. Content varies depending on the stage of the project which has been attained. For example, earliest training was in how to organize village health committees. Now that these have been established,

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Figure 1

PROJECT ORGANIZATION



training is focusing on the development of micro-projects. In addition to this type of training which focuses on management and organizational skills, seminars have covered specific topics such as pump maintenance, health practices, village hygiene, and water-related diseases. In addition, seminars have been conducted on special topics when problems have arisen in the project. A particularly useful aspect of training has been that at the end of seminars the participants have been asked to evaluate the sessions. This has provided them with an opportunity to have input into the design of future training programs.

During the interviews, agents were questioned about their training. In general, their comments were extremely positive. They felt their training had been useful and had prepared them adequately for the work in the field. When asked which aspects of their training had been most useful, a majority of agents mentioned the skills they had acquired which enabled them to organize villagers into health committees. They felt they would not have been able to succeed at this without their project training. Many agents also stated that the practical training had been more useful to them than that which was more theoretical. Other "most useful" features of training mentioned by one or more agents include the following:

- . training of trainers,
- . conflict resolution in villages,
- . communication techniques,
- . group dynamics, and
- . project planning.

Agents were hard-pressed to respond to a question on which aspects of their training had been least useful. The most frequently mentioned (by about half those interviewed) was the technique of role-play. Although they had initially found role-play interesting, some agents found when employing it that villagers did not take the subject matter seriously, or thought it was a "game for children". Agents commented that group discussion "among adults" was a much more effective teaching technique in their villages. It should be noted that at least two agents felt role-play was their most useful technique. Apparently, it is up to agents to evaluate the appropriateness of this technique in their particular villages.

Agents were asked to provide suggestions for additional areas in which training was needed. Most frequently mentioned was practical training, for example in techniques such as spring-capping, pump maintenance, and latrine construction. Also mentioned was training in the planning of micro projects (this is planned for the near future, as the project is now entering this phase). Several suggested more training in the development of visual aids for use in the village education campaigns. Two agents suggested that village chiefs should be included in the training given to the health committee members.

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4. AGENTS' WORK IN THE FIELD. During the interviews, agents were asked a series of questions about their work in the field. In general, they expressed strongly positive feelings concerning their relationships with their supervisors, Peace Corps Volunteers, and village health committees. Regarding their work with the latter, agents expressed pleasure that village participation goes beyond the committee members. A majority indicated that their meetings usually include many villagers in addition to those on the committee. In discussing their relationships with their supervisors and the PCV's, agents cited the collaborative nature of their work, with all performing similar activities. Agents saw this as a very positive factor.

Agents explained that the frequency of their visits to their villages depends upon the number which they cover (agents are responsible for between 3 and 20 villages) and the stage of the project, some stages requiring more intensive preparatory work. During each visit, the agents attempt to schedule the next visit. However, some agents reported difficulty in setting fixed times very far in advance, as circumstances often intervene to prevent meetings from being held as scheduled.

Agents felt they had won the confidence of the villagers. Some reported being called upon to assist in resolving problems unrelated to the project. They also often need to resolve conflicts among villages, particularly over water rights. They felt their training had prepared them well for this type of mediation.

Agents were questioned about ways in which their work with villages could be facilitated. Several mentioned that the guides they have been given to assist in planning village work are too complicated. They would like to work with USAID project personnel to develop simplified versions. About half the agents mentioned the need for first aid kits to take on their field visits.

A recurrent theme in this portion of the interview was management-related problems which they perceive as seriously impeding their work in the field. The primary problems, mentioned independently by a majority of those interviewed, are discussed in the Management Review section of this document.

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B. Village Level Analysis

1. Savannah Region. In the northernmost region, the Savannah, the project has gotten underway 12-18 months later than in the South. Although social promotion agents operate in the region and have already helped to establish health committees in many villages, few health or sanitation activities have begun. Drilling of wells and installation of pumps are the major project activities being conducted in the Savannah region as of early 1983. To obtain an idea of how these installations are proceeding, the team visited three villages, accompanied by the drilling team.

In Cinkasse the team observed the installation of a pump. Word had not spread to the villagers that the installation would occur that day, so few were present. However, the two villagers selected for pump maintenance were at the site and the team observed their training by the drilling team. This training consisted primarily of a trial-and-error assemblage of the moveable pump parts. Use of simple visual aids, such as a diagram indicating the order of pistons and other parts, should be considered for more effective training.

In Nayeng the villagers were observed constructing the margelle (apron) of the recently installed pump. The team had the opportunity to speak with several villagers, all of whom expressed the hope that the village would now have sufficient water. One villager asked for advice in how to obtain water for the pigs and poultry which he raised for the market.

While visiting Mogou, the team watched the testing of a new well to assess its potential yield which would begin operating in several weeks. A visit to the former water source was made, approximately 1 1/2 kilometers from the pump site. This site consisted of a series of holes of several meters, dug by women of various villages (each for a particular village). These shallow holes produced a very limited amount of extremely muddy water. Each village jealously guarded its hole, some attaching fetishes to frighten off water-seekers from neighboring villages.

2. Plateau Region. Annex C presents basic data on villages visited in the Plateau region. Table 1 summarizes some of the main findings obtained by questioning the village health committees; other findings are more conveniently presented in narrative form. As noted in the table, six of the nine villager visited had functioning pumps. In the other three, all attempts at well-drilling had been negative. Most of the health committees had been functioning for about a year. There were two exceptions, one of which is notable: Kounyohou, where social promotion agents had hesitated to go for over six months because of embarrassment over the negative drillings. That committee has existed only since January 1983. All of the committees except one have women

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TABLE 1

ESSENTIAL CHARACTERISTICS OF VILLAGES AND VILLAGE HEALTH COMMITTEES VISITED

Village	Prefecture	Population	Pump	Committee Since	No. Members	No. Women	Guinea Worm	Health Priority	Micro projr Discussed
Agadjame	Haho	350	Yes	26/8/82	11	5	Yes	Guinea worm	Yes
Tomtala	Haho	500	No	2/82	11	3	Yes	Guinea worm	No
Kounyohou	Ogou	364	No	23/1/83	10	No	No	Diarrhea	No
Avete	Ogou	800	Yes	20/2/82	12	3	No	Measles	Yes
Niantcugou Kope	Ogou	470	Yes	?	7	0	No	Intestinal parasites	Yes
Imoussa	Wawa	1000	Yes	31/3/82	11	4	No	Malaria	Yes
Idao	Amou	250	Yes	12/5/82	9	1	No	Malaria	Yes
Ezime	Amou	2952	No	?	13	4	No	Malaria	Yes

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members. In one, nearly half the members were women. Officers include the president, the secretary, the treasurer, the counselors, and usually two pump maintenance technicians. The secretary in nearly every case was a school teacher. The procedure for selecting committee members varied somewhat among the villages visited but usually involved a meeting of the entire population. The chief maintains a varying amount of control over the selection depending on the ethnic composition of the village. This factor depends further on the relative authority of the chief in such matters in villages with only one ethnic group, and on the number of different ethnic groups in those villages that have a heterogenous composition.

Two villages, both in the Haho prefecture, were endemic for Guinea worm. For those villages, it is the priority health problem. Others named malaria, diarrhea, intestinal parasites and measles in that order of frequency. All but two villages had begun discussing their microproject. In only two had the discussions led to any planning and in no village had any activity begun.

With the foregoing as a general introduction to discussing the status of the village health committees, the next step is a more detailed presentation and discussion of the findings of the inquiry. The presentation of the findings will follow the order of the questions not summarized in the table. For convenience in grouping the findings, the villages with pumps will be discussed first, followed by those without pumps, the so-called "dry villages".

Villages with pumps

In general the pump is located at a distance of several hundred meters from the edge of the village. All the pumps except two were observed or reported to have severe problems of queuing-up, resulting in long waits. Both these factors, distance and waiting-in-line, are discussed below, but more fully in the engineering analysis.

Functioning of the health committees

All the committees reported that they met more or less regularly, and even in the absence of the social promotion agent. The meetings are usually attended by other villagers.

In several cases, the president of the committee expressed great appreciation for the training given by the project. Some said they hadn't known how to organize themselves before the training since they were "simple villagers". In general, the greatest value placed upon the training was in fact the acquired ability to organize themselves to a concerted action. In one instance, this result was expressed more in

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terms of "learning to live as a society". Other committees were a little more vague about what they had learned. One seemed to particularly appreciate learning where and how to ask for help.

The immediate result of the training received was in all cases a series of activities, usually a general village clean-up, a programme for keeping the area around the pump clean, and a plan for maintaining and repairing the pump, usually involving the creation of some kind of a fund. Variations on the activities were several. In fact, each village presented a rather unique history of response to the project. In four villages the fund is raised by collecting a fee per capita; in the others, a community money-making project, most often a communal field, has been planned. Among the villages collecting a fee, one has two systems: one for men, the other for women. The men pay 200 francs a month, the women 25 francs. They have already collected 20,000 francs, from which a spare piston and several spare rings have been bought in advance. In another village, all efforts to collect money have thus far been frustrated. A poor harvest and heavy family expenses were blamed. In still another village, the fund is contributed to by some of the residents of a neighboring village with borders right at the pump. In a fourth village, the fund, kept by the secretary, has already been used to buy spare parts for the pump. Because the money had already been collected, the delay in repairing the pump was minimal.

Not one of the communal projects has as yet netted any funds. Both villages have begun their fields but are awaiting the rains. In one of the villages recalcitrant citizens who refuse to work are made to pay 300 francs instead.

Other variations in the initial activities of the committees centered around the village clean-up programme and that for keeping the pump maintained and repaired and the pump surroundings clean.

One village had just received its pump the week before the visit so that no real programmes had begun beyond the initial installation. In all the others, the village clean-up was carried out with reportedly no problems. Those who refused or failed to participate are usually brought to the chief and made to pay a fine.

The clean-up of the area surrounding the pump is the exclusive responsibility of the women in one village and of a committee of primary school students in another. This task also appeared to proceed generally with little difficulty.

Activities of the Committees

Following the establishment of these basic activities, most villages have entered a second phase where the social promotion agent has worked closely with the committee to define local health priorities and to

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design local means of combatting these health problems. This phase had progressed in a variable manner in those villages visited. In most, the activity had not progressed beyond the definition of the problem. Table 1 identifies the problem selected by each village. The procedure for arriving at this decision involves house-to-house visitation by committee members, followed by a general meeting with the population, with the committee making the final choice. In some villages, the meeting is attended by only a representative group from the population.

In one of the villages identifying malaria as the chief health problem, a village campaign to eliminate small collections of water had begun. In another, latrine construction had been conceived of as part of the malaria control program.

These activities are in fact supposed to be preparatory to the planning and execution of microprojects. In most cases, however, the response to the identified problem is not an activity requiring funds, so that in many villages other projects, not necessarily bearing a direct relationship to the identified problem, have been put forth by the committee. Table 2 summarizes these proposed projects.

Of note are the recurring projects: latrines, village pharmacies, and school projects. The first type is usually conceived of as a communal or public type latrine, in one case for a dispensary, in most cases for defined neighborhoods. When asked whether they expected any problems in maintaining the cleanliness of these public latrines, the members of one committee seemed unaware of any possible problem. This response is surprising in view of the miserable history of public latrines of any type in Africa.

Many of the proposed projects, of course, fall outside the area of water supply and sanitation, even when the definition is stretched to its utmost limit. But certainly there would be nothing to inhibit villages from using the organizational resources and expertise gained through the project as well as the local funds to launch these projects. The one exception would be the village pharmacies, since there is apparently a policy factor inhibiting their organization. Only one village had begun a vegetable garden at the pump site and it appeared to be well kept.

Most committees expressed great appreciation for the work of the social promotion agents in the areas of village health and hygiene and in fact several expressed a desire for more training in these areas. There was also expressed a general desire for more frequent visits by the agents.

Participation in decision-making on health priorities and on microproject selection appeared not to be a problem. There seems to be wide use of village meetings to deal with issues and problems.

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TABLE 2
PROPOSED MICRO PROJECTS

Village	Projects Proposed	Projects begun
Agadjame	Village pharmacy Primary school Vegetable garden Livestock	None
Avete	Latrines Village pharmacy Livestock New school buildings Maternity	None
Niamtougou Kope	None mentioned	
Imoussa	Construction of a storage building Latrine for dispensary Latrines for each neighborhood	None
Idao	A school Latrines	None
Kuma-Tsame-Totsi	Dispensary Latrine	Latrines

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Villages Without Pumps

Although many of the same questions were posed to the committees in these so-called "dry villages", the responses were so colored by the absence of an adequate water supply that a separate discussion is merited. These villages may be considered typical of at least a proportion of the 44 project villages without pumps. A possible exception would be the dry villages of the Wawa prefecture where the water supply situation (springs) is somewhat different. Unfortunately only one village, with a pump, was visited there.

Kounyohou

With 364 inhabitants, this is a village typical of the eastern section of the Ogou prefecture. In this village the formation and training of the health committee was completely inhibited for nine months by the failure to find water. The social promotion agents, in fact, could not bring themselves to return to the village since so much of the initial thrust of their work had centered on the probability of having a functioning well. Since the possibility of building cisterns for rainwater catchment has emerged, however, the agents have had new courage to come back, and the health committee has been formed.

There are several rainwater catchment efforts already in place in the village--jars set under a short gutter on the few houses with corrugated metal roofs. The chief is adamant about having a well, however, and the committee has organized the collection of 90,000 francs for the drilling. They hope to tap into a mineral prospection drilling operation in the area that is run by the Ministry of Mines. In this project, water wells are put in as a side benefit of the drilling operation in villages willing to pay. The project is funded by UNDP. The committee apparently intends to use its funds to pay for another drilling effort.

Because of the high probability of a negative drilling and thus a waste of village funds, it is recommended that the committee be influenced to invest its money plus microproject funds in the construction of a large public building (school, maternity, or simply a storage area) with a corrugated metal roof, from which rainwater could be collected into a large public cistern. There is likely to be resistance to this idea from villagers who already have corrugated roofs but the idea should be pursued until a clearly informed decision can be made.

Tomtala

With a population of 500, it is representative of the dry areas of the Haho prefecture, where the prevalence of Guinea worm infection is high. The committee was remarkable for its determination to carry on with the project despite a negative drilling and despite severe conflict with a nearby (2 km) village with a well over rights to use the well.

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This conflict occurred despite the fact that Tomtala had contributed money to the fund in the other village. The social promotion agent had intervened to help resolve this conflict.

The committee expressed great appreciation for the particular agent, not only because of his efforts in resolving this conflict but also because of the training given to the committee and the help in the areas of village hygiene and the means for raising local funds (collective field). The committee is convinced that with the use of the well in the neighboring village and the increase in village cleanliness, the prevalence of Guinea worm infection has diminished.

Since only one attempt at well drilling was made, at least two more should be undertaken. In addition, a public rainwater catchment scheme should be pursued, and perhaps the maternity that the committee proposed as a microproject.

Ezime

Ezime (population 2952) convoked a large meeting for the visit, in fact the largest of all the villages. Four attempts have been made to drill for water, all without success. Despite this negative result, the committee has pursued a programme of activities including village clean-up and collection of funds.

A long list of potential microprojects was put forth including many suggested by the dispensary nurse who is a committee member. This list includes:

- . A cistern at the dispensary;
- . Latrines throughout the village in public places;
- . Housing for nurses, teachers and other personnel;
- . Structural improvements in the dispensary and the maternity;
- . Technical supplies for the same units; and
- . A kitchen for the maternity.

Although there is a cooperative in the village, the committee expressed a need for further training in management and organization. It was apparent from the discussion that there had been many problems in gaining the participation of the population.

Just beside the village is a perennial stream used for all purposes by the villagers. Questioning revealed that the stream originates on the mountain that rises just behind the village. Several persons, including the Peace Corps volunteer, agreed that the spring is about three kilometers from the village, and that there are no significant obstacles such as large boulders, valleys or gulches between the source and the village. Further investigation revealed that a French coffee and cacao

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research organization owns land behind the village and through which the stream runs. Gaining access through their land and possible conflict over stream rights might present serious obstacles to exploiting the stream. The possibility of tapping the stream at its source for a gravity system to the village should, however, be pursued.

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C. Conclusions and Recommendations

. In the original project document the project objectives focus improving the health status of the rural population of Togo, thereby leading to their increased agricultural productivity. The project logframe states that "reduction of diseases in the project area" (to be verified by medical records) will be an objectively verifiable indicator of goal achievement. It is felt that, in order to do justice to the project's achievement, the focus of these objectives should be shifted to behavioral outputs. Given general health conditions, as well as the inability of the project to provide adequate water supply for all villagers in all villages touched by the project, it is unrealistic to expect (at least in the short to middle-term) a measurable reduction in the incidence of water-related diseases (with the possible exception of Guinea worm). Even less likely are reductions in infant/child mortality. The major strength of the project is the organization and mobilization of villages through village health committees. The primary impact which can result is the reinforcement of existing good health practices (e.g., village clean-up campaigns) and the introduction of new concepts (e.g., that of preventive medicine). Project goals should be restated to reflect these outputs, as well as the other major area, i.e., the teaching of organizational and managerial skills to villagers. These behavioral indicators will provide a more realistic assessment of the project's success at its conclusion.

. There is consensus among the social promotion agents that the major difficulties they encounter in their work are linked to the management issues discussed in detail in this section. These are clearly impeding the agents' movement and efficacy in the field and are having a negative impact on morale. Prompt rectification of these management problems is essential to the continued functioning and increased effectiveness of the project.

. Training of agents appears to be thorough and effective. A major advantage is that training is on-going, with periodic seminars being held. Agents have strong feelings about the training. Particularly those who have been in the field for some time have many constructive comments, and are eager to offer them. A formal study of agents' opinions and recommendations for training would provide extremely useful input for continued planning of the project's training program.

. A substantial amount of survey data has been collected to date, including baseline research on water utilization, health status, and sanitation. However, problems associated with the design, execution and analysis of the surveys have prevented the maximization of their utility. For example, the timing of the surveys in the project regions did not permit all of them to serve as true baseline measures. The project staff itself questions the reliability of the water utilization survey conducted in the Plateau region. A third problem is related to the village survey conducted under the direction of a Peace Corps Volunteer who has a Masters degree in Public Health.

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The scope of this survey, and the hand tabulation of the data, are too ambitious for even this dedicated and competent volunteer. Data collection efforts in the Savannah region have profited from the lessons learned in the Plateau, and some of these problems can be avoided there. Nevertheless, it would be advisable to revise the system of data collection to reflect the restated (see recommendation above) project objectives. Revision should include establishment of indicators for measuring short and middle-term behavioral goals as well as a re-examination of the methods of collecting health data from dispensaries for eventual long-term evaluation. In addition, assistance should be provided in the analysis of the survey data. The REDSO/WCA computer system which may be in operation during the coming months, could be utilized for this.

. Most health committees appeared to be functioning well. In at least three, however, there are serious problems with organizing the population around activities, collecting money, and/or conflicts with neighboring villages over rights to a pump. Further training in general management and organization plus training in simple accounting and fiscal management procedures is in order.

. Although health priorities have been identified in most villages, the priority health problem seldom bears a direct relationship to the micro projects being proposed. A different approach to micro project planning, perhaps using a broader problem-solving approach based on issues beyond health, should be employed. Water supply after all has economic and social as well as health benefits.

. Further training of the committees in health and hygiene should not be neglected, however. Many expressed a desire for it, and there are many tasks that the committees can undertake at little or no cost to meet health priorities such as malaria control, diarrhea control, prevention of dehydration, and Guinea worm control.

. In both dry villages and in those with populations too large for one well, there has been a general neglect of alternative water sources; springs, gravity systems, rainwater catchment, infiltration galleries next to rivers and perennial marigots, etc. Several large villages complained that one well was insufficient. Most continue to use other sources to supply their needs, largely because of long waits at the well. It is strongly recommended that every village in these categories undertake a broad-based water resource survey and that project funds be used to apply appropriate technologies to source improvements.

. Participation of women in the project is not as high as might be desired, both at the agent and village levels. The number of women on village health committees varies, but rarely exceeds 25 percent in any of the villages visited. Agents should be reminded of the importance of insuring women's active participation in the village health committees and in their activities. This issue should be brought up by the agent

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with the committees, as the latter do not always seek to include women among their members. Women play a key role in village life, and can be instrumental in introducing and reinforcing improved hygiene and health practices in the villages.

. Some villages have made an active effort to involve youth in the village health and sanitation activities. Like women, young people can play an important role, particularly vis-a-vis their younger siblings in the household. Agents should encourage villages either to organize youth committees at schools or, if it appears more practical, simply to solicit active cooperation of young people in such activities as village clean-up programs.

. Latrine construction in the Plateau region appears to be a top priority in many villages, but plans seem to be directed incorrectly toward public rather than private latrines. A complete reassessment of the latrine program, including the search for less costly models and the evaluation of various models based on soil characteristics, cost and local preferences, should be undertaken.

. The drains from the wells are generally poorly managed. In only one village had a garden been started. Drain management, preferably with attempts at vegetable gardening, should become a major health committee activity. Many committees expressed their satisfaction with the benefits brought by the presence of a well in the village - both health improvements, especially in the lowering of diarrhea incidence and Guinea worm prevalence, and the convenience to women who now have more time for household management, child care, and work in the fields. These benefits have not yet been realized by many project villages with no well (44 in all) and even in some villages with one well where women still find it easier to walk 3 kilometers, to a marigot than to wait for hours at the pump. As long as these needs remain unsatisfied, much of the progress of the health committees in related areas of village improvement will be hampered.

. Although some activities have already been conducted, the education campaign component of the project will become a major thrust during the coming year. This is a key project activity, particularly in light of the suggested restated project objectives discussed above. Before the campaign gets underway, it is recommended that careful study be done of the appropriate techniques to be used and a detailed plan be drawn up, using the skills of an expert in communications if necessary. There are many problems inherent in designing educational materials for non-literate populations, and in West Africa the language problem is particularly acute. It is essential that comprehensive research, including message-testing, be conducted at the outset and before educational materials are produced in quantity.

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ECONOMIC ANALYSIS^{1/}

Benefits: Substantial But Difficult to Measure

A convenient village water source reduces hours spent fetching water from distant supply points. Part of that time and effort can be spent on alternative productive activities, i.e., tending a larger garden; more time on school work; handicrafts; increased field work--especially in peak planting and harvesting seasons when labor is scarce.

Safe water curtails disease, sickness and death. In Togo, specific diseases and health problems related to low quality and general lack of water include:

- . Diarrhea (incidence and prevalence is significant in Togo),
- . Guinea Worm (a localized disease prevalent in many Togolese villages),
- . Nutritional Status,
- . Schistosomiasis, and
- . Intestinal Worms (i.e., ascaris and whip worm).

When women and children have to walk several kilometers for water, they generally fetch it only for drinking and cooking. Water for washing is less available resulting in contamination of food and prevalence of skin diseases. Few village families will bear the costs (in terms of time and fuel) of boiling water to desinfect. Storing boiled water as it cools also presents problems. Unsafe water for cooking utensils leads to risk of contamination since many major diseases survive long periods outside the body.

These very basic conveniences translate into solid economic benefits if the project is successful in providing villages with a more convenient source of potable water. The most important economic benefits are as follows:

1/ A brief macroeconomic overview for Togo is contained in the Economic Annex.

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• SAVING IN TIME.

Main beneficiaries are rural women and children who carry most of the water. Cost in time for fetching water from a previously inconvenient source is great. The costs rise in the dry season as women and children walk longer distances. In some cases women travel between 10 to 20 kilometers to fetch water. They can use up many calories and as much as 3 to 9 hours daily just to obtain water for drinking and cooking.

• HEALTH RELATED BENEFITS.

All villagers benefit from improved health. Given the high infant mortality rates, children are probably the greatest recipients of health related benefits. Health related benefits include:

• Maintenance until death.

Costs of maintaining the child or adult up to death is a major source of savings of this project (assuming cause of death can be traced to water supply).

Categories of expenditures include:

- Food,
- Housing,
- Clothing,
- Education,
- Health and Hygiene, and
- Transport.

• Lower Fertility.

Most studies indicate that lower infant mortality rates have a negative impact on fertility.

• Absenteeism.

Absenteeism due to illness and disease (caused by poor water) are very costly. Guinea worm, which can be completely eradicated with good hygiene and potable water, lowers productivity because of its prevalence during the planting season when workers are in short supply. In extreme cases, absenteeism may occur due to the enormous time needed to fetch water.

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- Reduced quantity and quality of work.

Illness and disease (caused by poor water) limits energy and effort of farmers, even when not absent from work.

- Loss in human capital investment.

Diminished concentration of students (from illness related to poor quantity and quality water and loss of energy due to fetching water) can curtail future productivity in the villages. In some villages children's long hours fetching water precludes any chance of going to school.

- Costs of treating illness (from poor water) include:

- Purchasing drugs,
- Payments to traditional healers, and
- Costly curative medical treatment.

In the Savannah region alone in 1974, it has been estimated that there were over 62 thousand visits to medical facilities for water related diseases).

- Costs of material losses due to enteric diseases that impair the intestinal nutrients (due to poor water).

- SAVING IN URBAN INFRASTRUCTURE COSTS

Costs of maintaining families in urban areas is higher than in rural areas. Water shortages can be a major factor forcing urban migration. Higher social costs of maintaining urban families and agricultural production losses of farm families incurred when not engaged in productive rural activities (as opposed to being part of urban unemployed or under-employed) can represent a significant economic loss to Togo.

- INCOME DISTRIBUTION

This program improves income distribution because the water is targeted to Togo's most disadvantaged group--the rural poor. For years, Togo's resources have been drawn from its rural interior to build up a basically urban infrastructure. The development of Lome has been paid for largely by increased taxes levied on rural areas. This project represents a transfer of resources back to where much of the urban development was financed--the rural

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villages. The poor get a larger share of the countries resources than would otherwise be the case. This leads to a more equitable distribution of income in addition to reinvestment in Togo's main economic base—the agricultural sector.

• IMPROVED VILLAGE INSTITUTIONS

Leaders in many rural villages move on when a community lacks an organization capable of handling its problems. Installation of wells and the associated educational program develop not only village leadership but encourage "movers" to remain and have an impact at the village level.

• LIMITATIONS

Ideally, decisions for investing in rural water supply systems should be based on rigorous benefit/cost analyses in which both benefits and costs are quantified. After considerable research no completely satisfactory method has been developed for quantifying the benefits of improved water supply. World Health Organization (WHO) experts feel strongly however, that safe water is essential for good health and a prerequisite to the control of most frequent diseases affecting the rural areas.^{1/} The number of diseases is generally greater than in urban settings. While alternate water sources exist, they are polluted, inconvenient and/or unreliable.^{2/}

In no cases were there readily quantifiable direct benefits (i.e., agro-industries). As a result, it is difficult to present a quantifiably rigorous economic justification for the Togolese water project. However, examples are useful in illustrating the

^{1/} Possibly half of the deaths in less developing countries (LDCs) occur in children under five with diarrheal disease being the most common cause. Clean water is a significant factor in lowering the incidence and severity of diarrhea.

^{2/} The World Bank has recently pointed out that the main diseases in Togo are malaria and sicknesses caused or aggravated by unhygienic living conditions, or insufficient polluted water. (World Bank, 1982, Vol. II, p.2) and that a sufficient supply of clean water can substantially reduce the incidence of most diseases.

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potential economic ramifications of increased potable water for the Togolese rural poor.^{1/} In some cases conservative estimates for the benefit stream strongly support funding a project. This is the case for the Togo Rural Water and Sanitation Program.

^{1/} Unfortunately accurate prediction of the impact of water supply and sanitation projects together with its economic evaluation would provide investment planners with valuable information for making net economic benefits (on costs) explicit. This information together with social and political considerations could be factors in decisions to invest. While this analysis is useful, one must be aware of certain caveats such as 1) whether or not there is unemployment and 2) whether increased productivity or earnings should be valued net of consumption.

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Benefit-Cost Analysis: A Positive Economic Impact

The original PP (p.20) cites an example of an AID economist's attempt to estimate the economic gains of a village well and sanitation program for Chad. The very conservative annual benefits resulting from installing a tube well in a village of 300 residents were as follows:

Savings in food from infants and children dying prematurely.....	\$ 590
Absenteeism from work.....	\$ 729
Cost of medicine	\$ 776
Time savings in fetching water	\$ <u>1,676</u>
Total	\$ <u>3,771</u>

Many economic benefits of this project have been omitted including:

- . Substantial nonfood costs of maintaining children up to their deaths (i.e. education, housing, clothing, costs of obtaining water).
- . Loss in human capital investment due to diminished concentration on productive learning activities.
- . Reduced quantity and quality of work, when not absent from work.

Discounting at 10 percent, the \$75 annual depreciation costs represent a present value of \$750. Discounting at a 10 percent discount rate yields a \$37,710 present value of benefits over an infinite life span of the project. Thus a conservative estimate for costs and benefits leads to a high benefit-cost ratio approaching 2, when using the estimated \$19 thousand project costs and assuming conservatively a full disbursement of costs at the beginning of the project.¹ Under these

1/ Discounting costs at 10 percent discount rate over time would lower the present value of project costs and increase both the benefit-cost ratio and the rate of return on investment.

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conservative estimates, present value of the benefit stream would justify the costs after only seven years. If the benefits could more adequately be measured, the length of time for recovering costs would decline substantially.

Justification for Public Health Education Program

The economic impact of water through improved health in Togo depends on the success of removing or lessening diseases. This ultimately depends on the way villages use water. Breaking the chain of transmission of certain diseases such as Guinea Worm requires improved excreta disposal methods. The combination of potable water and health education is the most effective means of control. Public health education is certainly needed to achieve full health benefits.

Revised Estimates Based on Actual Cost Declines

All revisions strengthen the original strong economic support for this project. Well construction costs have been enormously overestimated as of April 1983. Overestimation stems from:

- Declining costs of technology,
- Lower start-up costs, and
- Strengthened dollar vis-a-vis the CFA

At the original project's dollar price, 600 to 700 operating wells will probably be constructed.^{1/} Relatively small additional costs for buying, installing and maintaining (i.e. during an initial grace period) the pumps will be paid by FED and FAC. Factor costs of each well have been reduced by more than a third. Thirteen thousand dollars replaces \$19 thousand as a conservative estimate for the present value of the costs of each well.

Women save at least two hours per day fetching water. Assume conservatively 60 women beneficiaries per well. This is probably a low estimate for women and certainly excludes the substantial effort of children in the villages. Each village saves daily 120 hours (i.e. 60 women times 2 hours per day) or 10 full 12-hour work days. If women's work is valued at \$0.50 per day and women carry water once a day for 300 days of the year, an estimate of annual savings from just fetching water is \$1,500. At a 10 percent discount rate, the present value of savings

^{1/} These estimates were given to the team by the USAID Project Manager. Exact figures can not be given because the success in finding sites with adequate water pressure is not known.

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from fetching water alone is \$15,000. This component of the benefit stream alone more than justifies the sum of the present value of installation costs, \$13,000, and the cost stream of maintenance and depreciation, \$750.

As illustrated in the earlier benefit/cost estimates, the economic savings from preventive health measures are probably more important in economic terms than the value of time saved in carrying water. Thus very conservative benefit estimates of the Togo Rural Water Project when compared to costs indicate economic justification for this project. Adding the value of the additional benefits would only strengthen the already strong economic support for this project.

Recommendations

This project was thoughtfully designed and implemented and is having a positive impact on thousands of Togo's rural poor. Recommendations aim not at substantially changing the construction or operation of the project, but at moving the project marginally toward a higher level of efficiency. Current momentum of this timely and excellent program should in no case be slowed down.

Villages should pay all maintenance, operation and depreciation costs (after initial grace period). They should contribute a somewhat higher amount than present to the construction costs.

Increasing the availability of funds will extend the project to more villagers in other rural areas. It increases the probability that funds will be available to meet operating expenses and minor repairs. In addition to instilling responsibility on the part of the village for their pumps, it guarantees that the level of service provided is appropriate to village needs.

Concentrate wells near regional growth points.

As the farmer's chances of engaging in profitable activities increases, economic benefits improve, other things being the same.

Growth points can be fertile regions or those with good potential for producing market surplus and export crops - cocoa, coffee, cotton, etc. Growth points may also be the areas surrounding rural market towns. In these regions, time and energy saved from a convenient potable water supply can be more efficiently and productively used.

This project initially concentrates on the Plateau and Savannah regions to economize the cost of well drillings and communication. Concentrating efforts on regional growth points within these two regions will allow further economics of scale to be realized in the construction and maintenance of the wells and the initial development of the labor intensive public health education program.

Place wells in villages where current water sources are very inconvenient and/or the quality of water is particularly low.

The economic gains in terms of improved health and time savings in fetching water is inversely related to the convenience and quality of alternative water supplies.

Contribute part of the costs of the micro projects.

Currently the micro projects are funded completely by the project funds (i.e., with the exception of local labor). If the project costs are borne by the villages, it will encourage an appropriate expenditure of funds.

Large villages with only one well but with an active social education program should be given a priority in well site selection.

Encourage Togo to increase agricultural market incentives.

Togo's neglect of agriculture by failing to provide adequate infrastructure and market incentives substantially curtails the potential benefits of this project. Lowering the market costs and raising the market incentives will encourage farmers to more profitably use the time and energy savings from this project.

ENGINEERING ANALYSIS

In general, the project was found technically to be very well designed and managed. Project objectives and methods of achieving these objectives were well thought out and documented in the project planning phase. Excellent technical advice and construction supervision by the consultant, BRGM, has played a key role in the success of the project.

Hydrogeologists use Stereo aerial photographs and geologic maps to locate points most likely to yield sufficient water. This information is coupled with factors such as logistics, village preference, etc., to make the final selection of drilling sites for each village.

BRGM also monitors well construction. Complete drilling logs are kept for determining payment to the contractor. Logs serve as regional hydrogeologic studies. Logs filed for future reference will provide information needed to upgrade wells with bigger pumps if need arises in the future. Included in the logs are complete pump tests on each well carried out after well completion.

The Vergnet foot pump has been standardized by the GOT for use in all government village well projects. The pump was found to be durable, easy to install and repair, and appropriate for most lift ranges and village situations encountered in Togo. Pump maintenance technicians assigned to Hydraulic Service are extremely well trained and conscientious, but substantially over-worked.

The project as it exists is based on small diameter wells equipped with manual pumps. There was evidence that the overall objectives could be better served by broadening the scope of the project to include alternative water supply systems such as stream fed gravity systems, shallow dug wells, infiltrations galleries, small reservoirs and roof catchment.

The primary objective of the original project was to provide 30 liters of water per person per day. It was found that this objective is not being met due to not providing enough pumps per capita or per village. The health and economic benefits stated in the project paper probably have not been fully met due to political pressure to distribute a fixed quantity of pumps and wells to a maximum number of people and villages.

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Recommendations

1. An official list of criteria for selecting well sites should be prepared by BRGM and Social Affairs.
2. A village representative should always be present during drilling site selection to provide village input, and to obtain reasons behind the final choices.
3. Modify discharge measurements during pump testing to allow more precision.
4. Social Affairs should train village health committees in the techniques and importance of proper maintenance of drains from pump aprons.
5. BRGM and FAC should notify the manufacturers of the Vergnet pump that the design should be improved to provide a better sanitary seal between the pump and well apron, and that the well should be vented to the atmosphere.^{1/}
6. Selection of the low-lift or high-lift model pump should be based on adherence to the design lift ranges. In questionable cases, the high lift model (30 mm piston) should be used.
7. Social Affairs should train villagers in routine maintenance and repair of the pump piston assembly and prepare a document for their village signature giving them technical and financial responsibility for maintenance and repair before they are on a recipient list for a well.
8. Hydraulic Service pump maintenance programs should be expanded about four-fold. A fully equipped technician with transportation could be placed in each prefecture instead of each region.
9. The project scope should be expanded to include the capability of studying and implementing alternative, more cost effective, village water systems such as gravity fed from springs, infiltration galleries, roof catchment, etc.

^{1/} Details are presented in the Engineering Annex.

10. Any continued funding for the project must be based on one pump serving no more than 250 people, or 30 liters per person per day from suitable alternative systems. This criterion must be met in existing project villages as well as new ones, where it is technically feasible.

11. The maintenance program for Social Affairs project vehicles should be strengthened by providing an adequately equipped workshop with a staff of suitably trained mechanics.

Due to the level of technical engineering detail necessitated by a thorough review of the project, all elaboration on the above summary and recommendations is found in the Engineering Annex.

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ANNEX I

Management Review

Annex A

Accounting firm involvement with USAID funding projects

A. Objectives

To assist the host Government in establishing an effective project monitoring system which includes design and maintenance of a financial control system and periodic audit of project expenditures.

B. Scope of Work

1. Project Management System

The Contractor will provide professional services by designing and implementing a comprehensive, simple, timely, and reasonably accurate PROJECT MANAGEMENT REPORTING AND MONITORING SYSTEM for project management staff.

(a) The system will provide:

(i) An adequate internal control for cash receipts, disbursements, balances, payrolls, inventories, property and financial reporting,

(ii) Quarterly, annual and life of project budgets,

(iii) Ready identification of actual and potential problems - identify causes of variances from project plans (budget) including an analysis of the project contract or progress against scope of work stated in the contract, and

(iv) Control over changes and modifications of the project and activities within the project by continuous monitoring.

(b) Participate in furthering financial management capabilities of project personnel to maintain the above system.

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- (c) Submit one annual and three quarterly reports for the 12 month period starting January 1, 1983. The initial report will include a description of the system (a simple system) design. Progress on the status of installation of this system and training of personnel to run it will be included in each subsequent quarterly report.

2. Review of Management Capability

Review the Project Management Unit's administrative capability and submit quarterly reports beginning with the period January 1, 1983 to USAID and project management on the following aspects of project activities.

- (a) The first quarterly report will include a written critique of the mid-project Evaluation Report if applicable. This critique will discuss the feasibility of implementation of the report's recommendations made to the host country, USAID, contract staff and administration. In the subsequent quarterly reports, emphasis will be on follow-up on recommendations, briefly indicating areas of implementation or lack thereof. For areas of inaction specific corrective recommendations should be made.
- (b) Monitor and present the financial progress of the project. This is comprised of:
 - (i) The draw-down of funds from the host government contribution combined in order to analyse the arrival of inputs in accordance with the plan as put forth in the project document and as amended thus far (AID will report on dollar costs on a quarterly basis).
 - (ii) Review of financial statements issued by the Project Accounts Staff and in doing so, special consideration should be given to recommending interventions to be taken by management to meet proposed project inputs in a timely manner.
- (c) On a semi-annual basis provide a review of all dollar costs by input category. A short review will be made of the status of participants training and their subsequent project input upon training completion. Contractor should visit the USAID Controller to examine USAID project financial records.
- (d) Provide a projection of the next quarter's dollar and local currency costs by line item based on discussions with project management staff and SULSU personnel.

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3. Annual Audit

- (a) Prepare a long form audit report for the 12 month period ending December 31, 1983. Special emphasis is to be given to the following areas:
 - (i) Effectiveness of the project financial management including internal control procedures,
 - (ii) Implementation of recommendations made in previous reports by the accounting firm,
 - (iii) A thorough assessment of the annual financial statements, and
 - (iv) Verification that inputs have been used as outlined in the project documents and amendments.
- (b) Copies of this audit are to be submitted to USAID, Project Management and appropriate host government officials.

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Management Review

Annex B

TO PROJECTS STATUS REPORT as of December 31, 1982

Togo Projects Status Report 12/31/82
Page 7 of 10

<u>PROJECT</u>	<u>OBLIGATION #</u>	<u>OBBLIGATED</u>	<u>DISBURSED</u>	<u>ACCRUALS</u>	<u>PIPELINE</u>
<u>693-0210 Togo Rural Water Supply and Sanitation PACD 9/30/84</u>					
<u>CDA-80-21693-CC18 \$1,500,000</u>					
PRO AC 8/31/80					
Agua Prins - Contract #1033-00	210-0-1-01	\$115,000.00	491,000.91	\$10,000.00	\$13,999.09
Jato B. Tcha-Tockey	2-01	1,321.46	4,321.46	-	-
Griffin Intrafor	4-01	1,379,000.00	1,379,000.00	-	-
Project Direct Cost	5-91	1,778.54	1,778.54	-	-
	TOTAL:	\$1,500,000.00	\$1,476,000.91	\$10,000.00	\$13,999.09
<u>CDA-81-21693-CC18 \$1,248,000</u>					
Amendments 1, 2, 3		\$1,200,000			
		1,350,000			
		698,000			
Unearmarked:					
John Austin - TDY/Lome	Control	\$646,066.95	-	-	\$646,066.95
Agua Prins - TDY/Lome + Abidjan	210-1-1-01	2,105.05	2,105.05	-	-
Office Equip. and Vehicle Procurement	02	578.00	578.00	-	-
1 U.S. made IBM typewriter (P.O. #82-01)	3-01	215,000.00	208,021.35	-	-
Various Purchases (P.O. #82-02/03)	02	1,500.00	1,061.65	-	6,976.61
Griffin Intrafor - Drilling Contract	03	5,750.00	3,329.72	-	436.35
Griffin Intrafor - 25% Contingency	4-01	1,408,680.00	122,814.64	2,420.00	-
Vehicle Repairs and Maintenance	02	698,920.00	314,481.43	250,000.00	1,035,865.36
Virginia Slocum PSC/P.O. 82-48	5-01	30,000.00	15,626.79	-	382,638.57
Other Costs - Local	1-03A	21,400.00	15,496.14	3,000.00	11,373.14
Local Commodities	5-01	10,000.00	3,796.73	5,903.86	-
Local Operational Costs	03	40,000.00	15,094.97	2,000.00	4,203.27
Local Salaries	04	95,000.00	49,460.43	5,000.00	19,905.03
Local Training	05	40,000.00	36,705.31	10,000.00	35,539.57
William Hanson P.O. 693-82-67	06	17,500.00	10,270.83	3,294.69	-
V. Slocum Amendment to contract for travel	1-03B	10,000.00	3,101.96	3,000.00	4,229.17
		7,500.00	2,024.70	1,000.00	4,898.04
				1,000.00	4,475.30
	TOTAL:	\$1,248,000.00	\$103,971.81	\$287,618.55	\$2,156,409.36
<u>CDA-82-21693-CC18 \$2,392,000</u>					
Amendment No. 4 8/03/82		\$1,600,000			
Amendment No. 5 9/29/82		792,000			
Unearmarked		\$2,199,000.00	-	-	\$2,199,000.00
S. Fry P10/T 2000J	210-2-101	80,000.00	6,875.98	-	73,124.02
A. Frime P10/T 2000Z	210-2-102	113,000.00	-	-	113,000.00
	TOTAL:	\$2,392,000.00	6,875.98	-	\$2,385,124.02

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Management Review

Annex C

Togo Rural Water Evaluation

- A. Issues of primary concern to Project Staff
1. Two and 4 wheel usage, distribution, and control (especially bikes for agents working full time on the project).
 2. Gas procurement, distribution, usage, control at all levels.
 3. Two and 4 wheel vehicle maintenance (parts procurement, distribution, role of Project mechanics).
 4. Pump maintenance and repair (effectiveness of village repairmen, parts procurement and availability, effectiveness of regional team from Hydraulique).
 5. Pump usage (Is the supply enough for the population? Are they using other water sources? What for?).
 6. Project resource distribution (centralized operational funds, distribution of office and building supplies, etc.).
 7. Training for field agents and village health committees, especially in the Plateau Region: What has been most and least useful? What improvements would they suggest?
 8. Per Diems for training and travel: review of entire system.
 9. Recordkeeping at all levels of project activities.
 10. Village Health Committees, especially for the Plateau Region: Do they still have the same numbers? Are they functional? Do they meet apart from sessions with agents? Do they consult the villagers about decisions and inform them of their activities?
- B. Recommendations the Project Staff would like from the Evaluation Team:
1. Review top-level Project management.
 2. More regional control over project resources.
 3. Flexible but well-accounted for gas distribution for field agents.
 4. Immediate bike distribution to agents based on need.

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5. Role of national and regional committees to be consultive only.
6. Criteria for new wells should be:
 - (a) in villages already in the Project or on original list;
 - (b) with a demonstrated water need;
 - (c) in areas infested by Guinea work;
 - (d) in villages which have participated actively in project (keeping caisse supplied, holding meetings, starting projects, etc.).
7. Pump parts procurement and distribution should be done outside of the SGGG stores system.
8. Project personnel (field agents and regional staff) should not be reassigned out of Project zone and replaced by new people, but can be reassigned within Project area based on staff needs).

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Management Review

Annex D



EMBASSY OF THE
UNITED STATES OF AMERICA
Agence Américaine pour le Développement International
Lomé, Togo

le 22 Octobre 1982

N/Réf: USAID/Togo/82/174

Monsieur le Ministre,

Il m'était un grand plaisir de discuter avec vous le 7 Octobre sur la future direction du projet commun socio-sanitaire du Gouvernement Togolais/USAID, précédemment sous la direction du Ministère des Affaires Sociales et de la Condition Féminine.

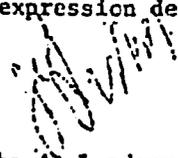
Je suis très satisfait que nous étions d'accord sur la nécessité d'une gestion saine du projet, spécialement le besoin d'une direction forte et responsable dans la personne d'un homologue togolais.

J'appris que nous sommes tombés d'accord que le nouveau coordinateur du projet devrait :

- rendre compte directement à votre cabinet au lieu d'être subordonné à un service quelconque dans le Ministère;
- avoir une classe personnelle assez élevée pour obtenir une coopération effective des différents services du Ministère de la Santé Publique et d'autres Ministères concernés dans l'exécution du projet;
- être affecté au projet à plein temps, libre des responsabilités de surveillance dans aucun service du Ministère; et
- avoir assez de capacité personnelle soutenue par une assistance adéquate pour assurer effectivement la gestion financière et la comptabilité pour les fonds du projet déboursés directement par le Gouvernement Togolais.

Je sais bien que l'identification et l'affectation d'une personne appropriée prendra certain temps. Néanmoins je suis sûr que vous choisirez le plus vite possible un (ou des) candidat(e)s qui conviendra le meilleur à tous les critères indiqués ci-dessus.

Veillez agréer, Monsieur le Ministre, l'expression de ma très haute considération.


John A. Lundgren
Représentant de l'USAID

Son Excellence
Monsieur Hodabalo Bodjona
Ministre de la Santé Publique et
des Affaires Sociales
Lomé

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ANNEX II

Health and Social Analysis

Annex A

Questions posed to social promotion agents

I. On their responsibilities

- a. For how many villages are you responsible?
- b. How long have you been assigned to this region?

II. On their training

- a. What was your general educational background?
- b. What specific training did you receive for the project?
(for how long and by whom?)
- c. What were the most useful aspects of your training for the project?
- d. What were the least useful aspects of the training?
- e. What modifications would you suggest in the training of social promotion agents?

III. On their work in the field

- a. What is the nature of your relationship with your chef de secteur (supervisor)?
- b. How often do you visit each of your villages?
- c. Who participates in your meetings in the villages
(committees and/or villagers)?
- d. What methods do you use to solicit the opinions of the committee members? of the villagers?
- e. What is the major problem which you encounter in your work in the villages?
- f. What types of education/communication materials do you think would be most useful for work in the villages?

Health and Social Analysis

Annex B

Questions posed to village health committees

I. On the structure of the committee

- a. How many members are there?
- b. How many women are members?
- c. When was the committee started?
- d. Have there been changes in membership since then?
- e. How were members selected?
- f. Who are the officers?

II. On the functioning of the committee

- a. How often does the committee meet?
- b. Who participates in these meetings besides committee members?
- c. Do you remember the training given to presidents, secretaries, and treasurers?
- d. What did you learn from that training?
- e. How have you applied what you learned?
- f. What further training do you need?

III. On the activities of the committee

- a. What have been the major activities of the committee up to this point?
- b. How has the social promotion agent worked with you?
- c. How have you gone about obtaining the participation of the rest of the population?

- d. Have you had any difficulties in gaining their participation?
- e. Is there a village fund?
- f. How is it supplied?
- g. How have you used it thus far?
- h. Have there been any pump breakdowns?
- i. What was the delay in making repairs if any?
- j. Have you had any difficulty in collecting money for the fund? Any difficulty in finding spare parts for the pump?
- k. Have you selected your microprojects?
- l. How did you decide on those projects? Who participated in the decision?
- m. Did you have any difficulty in making a decision? If so, what were those difficulties?

Health and Social Analysis

Annex C

List of Villages Visited in Plateau Region

<u>Name of Village</u>	<u>Population</u>	<u>Prefecture</u>	<u>Date of Visit</u>	<u>Functioning Well?</u>
Agadjane	350	Haho	22/3/83	Yes
Tomtala	500	Haho	22/3/83	No
Kounyohou	364	Ogou	22/3/83	No
Avete	800	Ogou	22/3/82	Yes
Niantogou Kope	470	Ogou	23/3/83	Yes
Imoussa	1000	Wawa	23/3/83	Yes
Idao	250	Amou	24/3/83	Yes
Ezime	2952	Amou	24/3/83	No
Kuma Tsame-Totsi	1000	Kloto	24/3/83	Yes

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ANNEX III

Economic Annex

Economic Overview

Togo is a small, poor country with an area of 57 thousand square kilometers and a population estimated at 2.5 million in 1980. Eighty percent of the population live in the rural areas. Per capita income was approximately \$380 in 1980 and only \$180 in the rural areas. Agriculture accounts for approximately 80 percent of employment and 30 percent of GDP. Smallholder food crops account for 70 percent of total production. Cash crops of cocoa, coffee, cotton and palm kernels generate 30 percent of Togo's foreign exchange earnings.

Togo's major foreign exchange earner is phosphates. A modern phosphate mine employs 1,600 persons but accounts for 6 percent of the GDP, 40 percent of export earnings and 30 percent of government revenues. The tertiary sector (i.e., commerce, transport, public administration, etc.) provides 50 percent of GDP and employs 15 percent of the labor force.

Togo has a relatively rich and varied resource base. With sound economic policies, Togo could sustain a more rapid and widely spread growth without deteriorating its external financial position. Phosphate revenues quadrupled in price in 1974, but declined dramatically in 1975 and Togo was unable to honor its financial obligations. Since 1975, public policy has exacerbated the inefficient allocation of resources and led to foreign indebtedness and slow growth. Togo entered the International Monetary Fund (IMF) standby arrangements in 1979 and 1981, and rescheduled its debts. This required decreased government expenditures and limits on domestic credit and external borrowing.

Togo's Gross National Product (GNP) increased 0.2 percent in 1980 and declined by 5.9 percent in 1981. Falling international prices for cocoa and coffee have aggravated the situation. Unfortunately, agriculture has been neglected in favor of unsound government enterprises. These projects, such as luxury hotel "2 Fevrier", continue to drain Togo's investment funds.^{1/} Togo's longtime objective should be diversifying the economy, encouraging the private sector, and allocating resources to more fully tap Togo's agricultural potential.

1/ Most of Togo's larger industry is fully or partly owned by the State. Most of the new facilities, including an oil refinery, a steel mill, a textile factory, two cotton mills, luxury hotels, are utilized below profitable capacity. The government is actively considering closing some of these enterprises.

Considerable potential remains for increasing both production and income (i.e., more use of fertilizers, insecticides and selected seeds; improved marketing and storage; and most importantly more production incentives for small farmers - particularly higher farmgate prices). At present, fertilizer subsidies to encourage small farm production are more than offset by low producer prices for coffee and cocoa. Forced farm sales have led to significant financial surplus. But low producer prices have discouraged harvesting of existing trees and replanting.

Implicit taxation of agriculture is justified if directed into socially productive government investments including projects that facilitate agricultural production and marketing. However, the major investments have been state enterprises which, with few exceptions, are incurring large losses - even when servicing of foreign debt, which is assumed by the Treasury, is excluded from their costs.

The government needs to return to its former positive support of the private sector and particularly the small farmer.

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ANNEX IV

ENGINEERING ANALYSIS ANNEX

Methodology

Project documents were reviewed prior to arrival in Togo, and additional project material was provided for review upon arrival in Lome.

March 14 and 15 were spent meeting project officials and advisors from the Hydraulic Service of the Ministry of Public Works, Mines, Energy and Water; the divisions of Environmental Health and Social Affairs of the Ministry of Health; Bureau for Minerals and Geologic Research (BRGM) and the USAID contract technical advisors to the project.

March 16 through 25 was spent in the field collecting data and observing all facets of project implementation and operation. The field work was greatly facilitated and streamlined by prior planning and organization by the USAID mission in Lome and participation and cooperation by all concerned parties in the field, including Hydraulic Service, BRGM, Social Affairs, Peace Corps and USAID contract advisors.

Activities in the field included observing site selection, well drilling and completion, pump testing of completed wells, construction of well apron and drain, pump installation and commissioning, and training of villagers in pump maintenance and water use. Fifteen operational project wells were visited and records were made of discharge, maintenance problems and water collection habits. One morning was spent with a maintenance technician in the field. Franchized spare parts dealers were visited to record inventories and prices. Two villages were visited where well drilling had been unsuccessful and alternative sources of water were sought. A cursory water use survey was conducted in one village with a project pump. March 28 through April 1 was spent in Lome meeting with various officials and parties to discuss different findings and implications of the evaluation and seeking the most rational recommendations for continuing to meet the project's stated goals and objectives in the most expedient way. It is noteworthy that Togo was experiencing its worst drought in five years during the evaluation.

The following technical evaluation will discuss various technical components and issues of the project, with comments on future implementation. Three terms will be applied in the comments which are defined below for clarification:

1. Suggestion: An item which project management may want to consider. The evaluation team is not in a position to make a firm recommendation from the outside.

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2. Recommendation: The evaluation team strongly urges the project staff to take action on the point in question.

3. Condition Precedent: These comments must be implemented before securing further funding and approval of a possible second project phase.

Location of Drilling Sites:

After a village is selected to receive a well or wells, a hydrogeologist from BRGM goes to the village to select the exact locations for drilling. 1:30,000 scale stereo aerial photos are used to identify geologic indications of water-bearing strata such as fractures, rock outcroppings, vegetative cover, etc. Geologic maps have been used with some success in certain areas with extensive geologic stratification. Electric resistivity and seismic studies have been used to a limited extent but generally found to be of questionable value and not cost effective.

For each site a map is made showing geologic features, village locations, roads, streams, etc. Selection of drilling sites is based on judgment using factors including hydrogeology, logistics, social acceptability, etc.

There is evidence that during the early phases of the project there was a lack of coordination between BRGM technicians, village representatives and Social Affairs officials in site selection. However, this communication and coordination has become stronger as the project has advanced.

It is recommended that BRGM and Social Affairs work together to make a list of criteria which should be considered during site selection. The list should indicate and quantify, if possible, any criteria which must be met - such as minimum flows, distances or social acceptability factors.

It is further recommended that an official village representative always be present during site selection. Social affairs officials should be involved in coordination. Factors considered in selection should be fully explained to the village representative. In case agreement in site selection cannot be made, Social Affairs will arbitrate and decide the drilling site. But in no circumstance should drilling be held up or delayed due to indecision of site selection. If agreement cannot be made, the drill team should leave the area and the village be taken from the project list.

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Well Construction and Construction Monitoring:

Wells are drilled using the air-rotary method through unconsolidated material and a down-the-hole air hammer through rock strata. This method and equipment is eminently appropriate for the geologic conditions and the type of wells needed for village water supply. Drilling is very fast, and well yield estimates can be made during the drilling process. Bore holes are about 200 mm in diameter. The wells are cased with 100 mm PVC (plastic) pipe with slotted screen. Wells are gravel-packed if screens are in unconsolidated strata, and grouted above the screen to the ground surface. A standard packer is used to retain the grout where gravel-pack is not needed. The 100 mm casing is the minimum diameter which can accept standard hand pump elements, but does not limit discharge if a larger power pump is installed in the future.

Complete well logs are kept both by the driller and BRGM inspector, including penetration rate, geologic characteristics of penetrated strata, depth and discharge. Cutting samples are collected and retained in each strata. The drill logs are later compared and used as a basis for payment to the drilling contractor.

The drill logs are retained by the Director of Energy and Mines for future reference. The logs were judged to be well prepared, complete and professional. They not only assure quality construction of project wells, but serve as a hydrogeologic survey which will be invaluable in future activities involving water supply in the area as well as possibly upgrading existing wells with power pumps as villages expand and develop.

Pump Testing of Wells:

Rough estimates of well discharge are made during drilling. These data are used to design a detailed pumping test to be carried out by BRGM and Service Hydraulique after well completion. The well is pumped at three different rates based on discharge estimates during drilling. Each rate is pumped for one hour, recording simultaneous measurements of time, water level in the well, and discharge. Pumping is done with a submersible electric pump, controlling discharge with a gate valve. Discharge is measured with a bucket and stop-watch. Water level is measured with a standard reel tape and water level sensor. Pump test results are analyzed and recorded with the well drilling logs at Service Hydraulique.

The primary purpose of pump testing is to assure that wells will yield adequate water for the manual pump to be installed, and to assess the potential of the well for possible use of a higher capacity power pump at a later date. The problem of deciding to commission or cover a marginal well is extremely difficult and worth some discussion.

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It is impossible to assess accurately the extent and volume of an aquifer without pump-testing over a very long period of time, and simultaneously measuring drawdown in multiple test wells located different distances and directions from the pumped well. Such a detailed test would cost much more than the well itself and cannot be justified. If wells are dry or produce substantially beyond the capacity of a manual pump, there is no problem deciding to commission or cover it up. However, in many cases pump testing shows wells that yield about the same or somewhat less than the manual pump capacity. For these cases there is some risk of the well becoming de-watered during periods of maximum use and prolonged drought. However, once villagers have seen water being pumped from the well, it is extremely difficult to convince them, and perhaps those making the decision, to cover the well when their alternative source may be a dirty water hole many kilometers away. BRGM has received some criticism because of a few wells which have de-watered during prolonged use in the dry season. This criticism is in no way justifiable. In fact, of the 157 pumps installed during the evaluation, there have been only six alleged cases of de-watering and this was at the end of the worst drought that Togo has experienced in five years. BRGM and Service Hydraulique are to be commended for their control which is reflected by this record.

It should be noted that the above problem of de-watering is a function of the aquifer's ability to store and transmit water, and is not related to long-term lowering of water tables or mining of groundwater. The small quantities of water used in village wells will have no long term or wide spread adverse effects on groundwater quantity.

The only improvement that can be envisioned in pump testing is to improve the precision of discharge measurements. It was observed that measurements were made into a plastic bucket with a volume of about ten liters, and timed with a stop watch. The observed pump-test had a maximum discharge of $6.1 \text{ m}^3/\text{hr}$, or 1.69 L/sec . It is doubtful if precision beyond one decimal place can be obtained with the equipment used; however, three decimals are claimed in the pump test documents. It is recommended that discharge measurements be made using calibrated containers which have a minimum volume of the quantity of water pumped in one minute.

Well Aprons:

Concrete aprons about 3.5×3.5 meters are constructed around the wells to provide a clean area for water collection and prevent surface runoff and drainage from entering the well. A small collector drain is built into the concrete in a 1.5 m square around the pump, and drained from the apron by a small channel. The apron is sloped to the collector drain to remove spilled water and facilitate keeping the apron clean. A small masonry protection wall (30 cm high) is built around the apron to protect it from animals and dirt. Spilled water is drained away from the apron in a small

earth channel leading down-slope from the well. Apron design and construction are excellent, and no improvements can be envisioned. However, many drain ditches were observed to be poorly maintained, dirty, and holding stagnant water. The original construction of the drain ditch is done by Service Hydraulique and considered adequate. But in some cases, in what was probably villagers' attempts to clean the drains, they have been excavated too deep near the apron, causing adverse grade or slope and resulting in ponded water. This can have serious effects on health, particularly with malaria as a mosquito breeding site. It was observed that at one well a pit had been dug at the apron edge in order to make earth bricks. It is recommended that Social Affaires, through its agents, train villagers in the importance of drain maintenance and teach proper grading techniques. The key is to maintain a small and shallow ditch or furrow with a continuous grade or slope; not to attempt to dig a deep ditch or drain pit.

Some interest was expressed regarding the possibility of using the pumps and wells for village gardens. Due to the priority of domestic water, the observed huge demand, and the high cost of the pumps, villagers should not be encouraged to use the pumps for gardening. However, if a community wash area could be constructed near a well, the rinse and drain water could be used for a garden. A pump serving 200 people could be used to irrigate a garden between 100 and 400 square meters, depending upon the quantity of wash water used and efficiency of water distribution. Many problems must be addressed before implementing a village garden scheme based on wash water, such as the social acceptability of communal washing, financing designs and construction of a suitable wash area, design of a suitable water distribution system, and organization of the village for division of labor and spoils from the garden. It may be a suitable micro-project for consideration in some villages. However, it is suggested that some preliminary thought go into general design of a suitable wash area and a pilot system be tested before attempts are made at wide-spread dissemination of the idea.

The Vergnet Pump:

This pump, of French design and manufacture, has been selected by the Togolese government for use on all public wells in government village water programs. The Vergnet pump was selected for its reputed durability, ease of installation and maintenance, appropriateness for the range of lifts encountered, and for standardization of spare parts. Its unique design is worth describing for those unfamiliar with the Vergnet pump.

The pumping element is lowered into the well below the water level, so the lift is not limited by atmospheric pressure. The pumping element consists of a cylindrical elastic rubber bladder inside of a stainless steel tube. The bladder fits loosely inside the tube so water can pass by it freely. The steel cylinder is

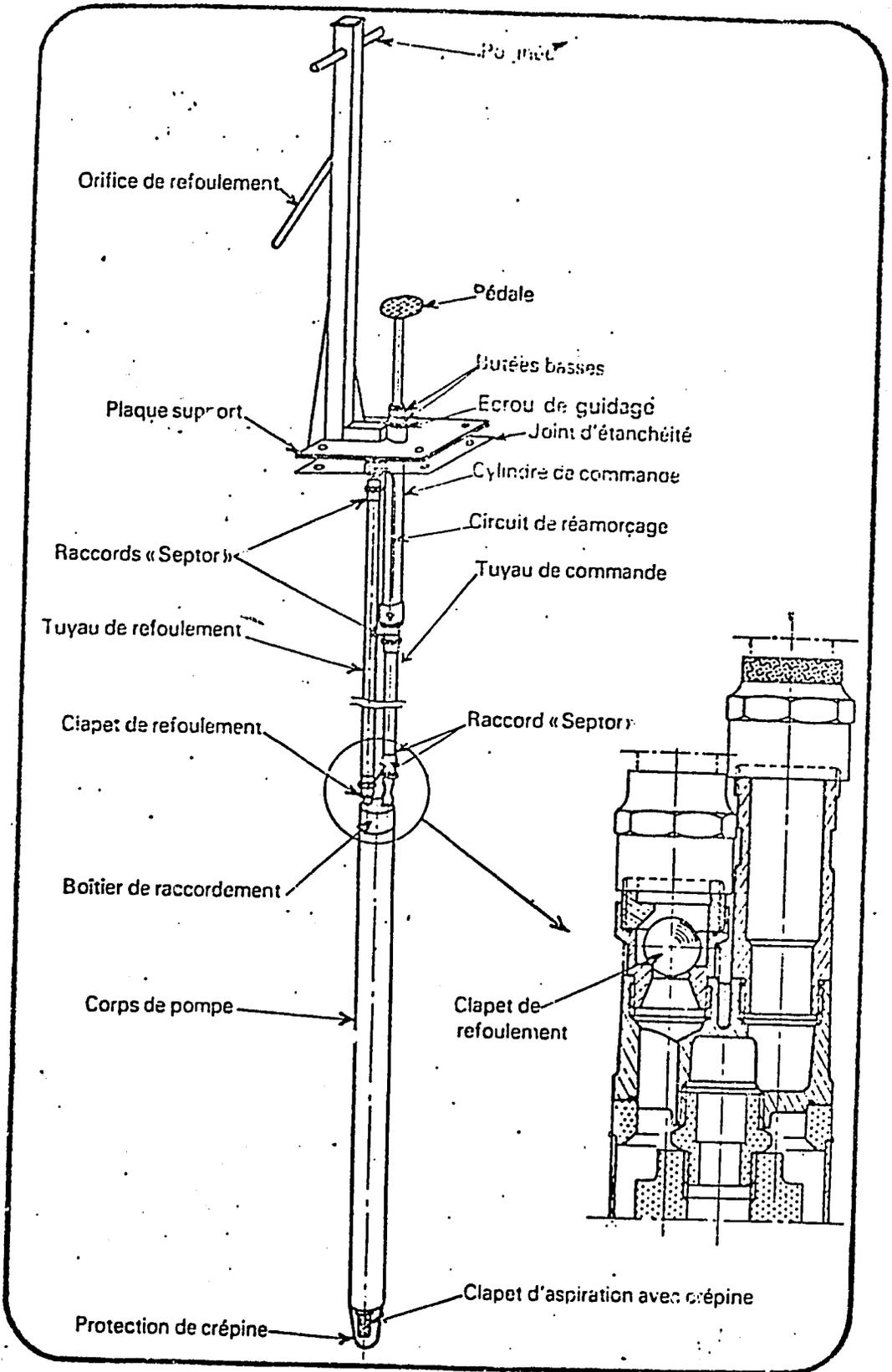
fitted with ball-type check valves in the top and bottom which allow flow into the bottom and out the top. The bladder is connected to a foot pedal activated piston and cylinder with a heavy ABS tube. The piston and cylinder unit are attached to the pump stand and well apron at the ground surface. The bladder, cylinder and connecting tube are filled with water and serve to transmit power from the foot-driven piston to the bladder. When the piston is pushed down with the foot, water is forced into the bladder, causing it to expand in length and diameter. This forces water out of the steel tube containing the bladder. The water is forced out the top check valve, which is connected to the pump spout with a separate parallel heavy ABS tube. When the foot pedal is released, the elastic force in the bladder causes it to contract, pushing the piston and foot pedal up again. During contraction of the bladder, water from the well is pushed into the steel tube through the bottom check valve by hydrostatic pressure - thus completing the pump cycle. There is a small passage between the discharge outlet and the bladder inlet fitted with a check valve which permits a small volume of water to enter the bladder-piston unit at the end of each stroke to assure it stays full. The excess of this bladder feed water is jetissoned out the top of the foot piston at the end of each stroke. Two models of pumps are being used in the project; pumps with a 40 mm piston and 46 cm stroke for small lifts, and pumps with a 30 mm piston and 32 cm stroke for higher lifts.

There are two advantages intrinsic in the Vergnet design: The first is that power transmission between the person pumping and the pumping element down the well is hydraulic as opposed to mechanical pump rods or shafts. This greatly simplifies installation and removal of the pump for maintenance and eliminates the many maintenance problems associated with mechanical drives. The second advantage is that parts subject to wear and frequent replacement (pistons and seals) are at the ground level and easily accessible. In fact, the piston unit can be taken out by removing one retaining nut and easily serviced or replaced by a trained village mechanic. A schematic diagram of pump and piston assembly are shown in Figures 2 and 3.

Fifteen project pumps were visited. Users were questioned about frequency and nature of pump failure, how it was fixed, and who paid for spare parts. Discharge measurements were made by timing how long it took to fill a 20 liter bucket with vigorous pumping. Pumping for all measurements was done by the same team member. Some discharge measurements were made with villagers (mostly women and children) using the same pump in order to see how their rates compared with trials by the evaluation team. Finally, some net pumping rates were measured by observing the quantity of water pumped by users over a 30 minute period in order to estimate the effect of down-time removing and replacing vessels and changing of pumpers. It should be noted that with few exceptions all pumps visited had queues waiting to receive water regardless of the time of our visit, and that net pumping rates were not affected by periods with nobody waiting to use the pump.

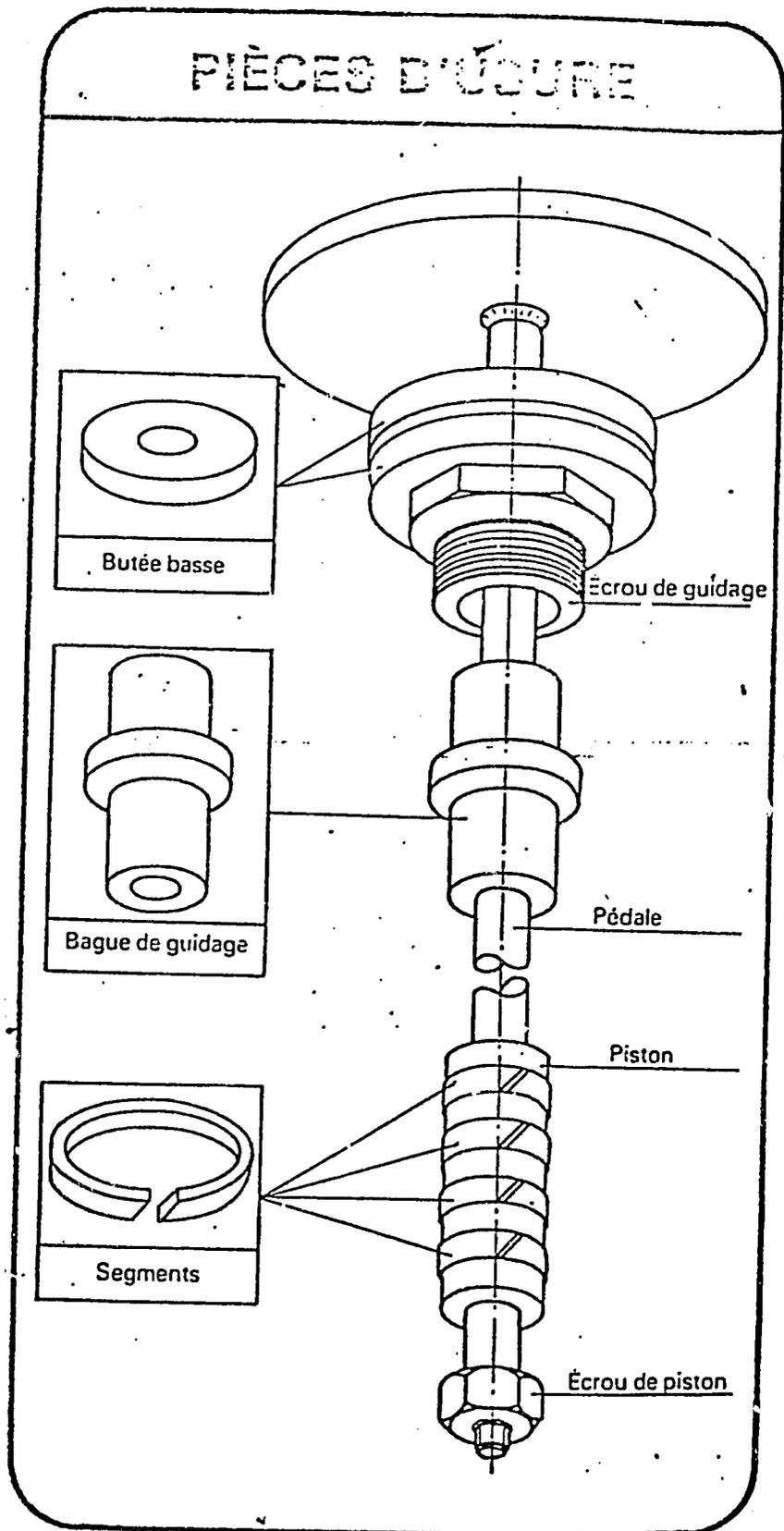
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Figure 2



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Figure 3



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Attempts were made in data compilation to estimate lifts and water-work during discharge measurements by using the well pump-test drawdown curves. In most cases these estimates were unreliable due to the extreme slopes of the drawdown curves and natural fluctuations of the static water level since the pump testing date.

Volumetric efficiency was measured on many wells, yielding some interesting findings from which some generalizations can be made. The Vergnet pump is essentially positive displacement and unsteady flow. Volumetric efficiency was measured by counting the strokes per twenty liters and calculating the swept volume of the piston per stroke. The volumetric efficiency is calculated by dividing the pumped volume per stroke by the volume swept by the piston. The volumetric efficiency of the 30 mm model pumps ranged from 135% to 180% during pump tests with vigorous pumping. The same measurements yielded volumetric efficiencies ranging from 75% to 105% for the 40 mm piston models. Volumetric efficiencies greater than 100% occur because the momentum of the water column in the pump discharge pipe yields some flow after the piston reaches the end of its stroke. It was noted that volumetric efficiency is greatly influenced by the pumping rate and the condition of the piston segments. This is to be expected, as the velocity of flow and momentum are less at the end of the pump stroke when pumping is slow, and there is more time during the stroke for water to leak past the piston and segments. It is believed that the low volumetric efficiency of the 40 mm pump is due to the fact that they are installed on wells with lifts beyond their design capacity.

Data from the observation of these 15 wells is compiled in Table 3 with explanatory notes.

Observations at many wells indicated that most water is pumped by women (many with babies on their backs) and children. The gross pumping rates for most of these users varied between 50% and 75% of the gross pump rates of the evaluation team engineer in Table 3. Net pumping rates measured over periods of 30 minutes indicate net flows of about 1/2 the gross pump rates in Table 3. These net pump rates were observed when demand was constant and reflect an average pumping rate, allowing for changes of users and vessels, but do not reflect average daily consumption unless the hours per day of pumping are known.

In general, the Vergnet pump is found to be very appropriate for the project, and its continued use is endorsed by this evaluation. There was one design feature of the pump that can be improved: The pump support plate is bolted to the concrete apron on top of the well with four bolts embedded in the apron. A rubber gasket about 2mm thick is between the plate and the apron. It is difficult or impossible to assure a good seal between the plate and apron with this design due to macro and micro surface irregularities (they aren't flat and smooth). When pumping commences or the rate

Table 3

TOGO PUMP SURVEY DATA												
1	2	3	4	5	6	7	8	9	10	11	12	
Name of Village	Well #	Well Depth	Static Water Level	Well Yield	Piston Dia.	Gross Discharge	Estimated Lift	Water Work	Reliability	Months of Service	Breakdown	Comments
Agadjeme	P540F3	59m	13m	17 L/m	30mm	13 L/m	17m	35w	fair	9	none	Piston segments changed once and are now worn out.
Niamtougoukopa	P022F2	56	-	-	30	22	-	-	-	0.2	none	Seal between pump and apron leaks.
Moussa	P437F1	35	8	180	30	26	9	35	good	3	none	
Avete	P356F1	41	5	83	30	20	9	27	good	4	none	Segments changed once.
Dadja Chogli	P582F1	39	2	100	30	24	9	33	good	4	none	Segments changed once.
Dadja	P582F1	41	6	50	30	25	17	70	fair	4	none	Segments changed 3 times.
Kotokope	P582F2	53	7	25	30	3	30	-	good	9	none	Well is dewatered.
Carrefour Nikerba	P539F1	60	9	67	30	19	10	32	good	9	none	Three villages alternate days of use
Wahala	P114F3	39	4	80	30	22	6	22	good	9	one	Pedal broken and welded.
Wahala	P114F2	47	7	8	30	16	45	120	poor	9	none	Well appears to yield better than pump test indicates.
Elavagnon	P441F1	75	4	17	40	20	11	33	good	14	one	Pedal broken and welded.
Ebeva	P232F1	51	3	50	40	20	9	30	good	14	none	Segments changed twice.
Adiva	P223F1	60	6	17	40	16	12	32	good	14	-	Segments are worn.
Evou-Betel	P223F1	73	2	10	40	16	20	52	poor	13	none	Lift is too great for large piston. Children cannot depress piston.
Lomnava	P494F1	51	7	20	40	20	13	41	fair	13	none	Segments replaced once.

Explanatory Notes:

- Well Number:** The first letter indicates the region ("P" for Plateau, "S" for Savanna, etc). The following three digit number is the official village number. The "F" stands for Forrage (well) and the last number is the order of successful wells drilled for the village in question.
- Well Depth:** The depth from ground surface to the bottom of the well in meters.
- Static Water Level:** The distance from the ground surface to the water level in the well at the time of pump testing before pumping commences in meters.
- Well Yield:** The estimated maximum long term yield of the well derived from the pump test in liters per minutes.
- Piston Diameter:** The 40 millimeter models are designed for low lifts and the 30 millimeter models are designed for higher lifts.
- Gross Discharge:** The discharge based on the time it takes the author to fill a 20 liter bucket pumping vigorously, in liters per minute.
- Estimated Lift:** Elevation difference between the pump outlet spout and water level in the well during gross discharge measurement. The lift was estimated using drawdown curves constructed based on pump test data.
- Water Work:** The net power required to lift 20 liters of water over the estimated lift in the measured time during the gross discharge measurement, in watts. The water work is calculated by $W = (9.8 \text{ m/sec} \times \text{sec})(20 \text{ liters})(\text{estimated lift})/(\text{seconds to fill bucket})$.
- Reliability:** The estimated reliability of the lift and water work estimates. "Good" indicates probable precision within 25%. "Fair" indicates probable precision within 50%. "Poor" indicates precision less than 50%.
- Months of Service:** The time interval between the installation of the pump and the evaluation interviews.
- Breakdowns:** The number of times a pump has been out of service due to parts failure.
- Comments:**

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increases, water level in the well decreases, with a resulting decrease in air pressure inside the well. This phenomena causes dirty water which has collected around the pump support plate to be aspirated into the well. The potential for pollution is exacerbated by the hundreds of feet that step on or near the support plate each day. It is recommended that BRGM or the mission notify the Vergnet company of this design characteristic and possibly suggest some solutions. One possible solution would be to use a soft plastic wax seal between the support plate and apron which would conform to surface irregularities when the plate bolts are tightened. This type of seal is commonly used between a toilet and its junction to the sewer pipe on a concrete floor. If this design was used, it would be advisable to provide a pressure relief vent between the well and atmosphere to equalize pressure inside the well. Such a vent would have to be designed and built into the pump at the factory.

It was also noted that the 40 mm piston low-lift pump models seem to be used without close regard to the lift conditions of the wells. It is recommended that the design lift criteria for the different pump models be strictly adhered to, or that the low-lift models be discontinued from the program.

The time delay between well drilling, apron construction and pump installation was many months in some cases and perhaps two months on the average. Many of these delays were reported to be due to delayed pump shipments. It can be demoralizing for villagers to see their well being pumped during testing and then waiting indeterminate periods to receive a pump. It is recommended that measures be taken to reduce the time period between well drilling, apron construction and pump installation to a reasonable minimum.

Pump Maintenance and Spare Parts:

In addition to interviews with villagers regarding pump maintenance problems, half a day was spent with the Hydraulic Service maintenance technician responsible for the entire plateau region. This man has the full responsibility for maintaining 328 pumps scattered in a region that requires the better part of a day to traverse. He schedules a routine visit to each pump every two months. Each pump is also provided with a sturdy card left with the village which gives pertinent well and pump data. If the pump requires service, the card is sent or taken to the one of four centers in the region and left to notify the service technician that service is needed. The tight maintenance schedule only allows the technician to visit each center about every two weeks. He receives an average of about five requests per day.

Maintenance problems can be divided into minor and major. Minor problems are replacement of the piston assembly parts, and, in

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theory, can be done by villagers. Major problems require removal of the pump stand and pulling the pumping elements from the well. This must be done by trained experts with proper equipment. By far the majority of maintenance requirements involve replacement of piston assembly parts. The piston segments need changing at least every few months for heavily used pumps. The most frequent major failure is the bladder. It ruptures or splits off from the metal end seals. Normal bladder life appears to be several years, but failure is sudden and can cause an immediate water crisis. Of the 328 pumps in the Plateau region the service technician estimated twenty to thirty bladder failures per year. The replacement part costs in excess of \$100. There have been some failures of check valves, but this occurs less frequently and usually does not happen suddenly.

One initial objective of the subject project was to train village mechanics in routine pump maintenance and shift financial and technical responsibility to the village for maintenance of the piston unit. In effect, this has not taken place. Villagers still rely heavily on Hydraulic Service for minor repairs and replacement of piston segments. The result is that Hydraulic Service technicians spend most of their time with routine maintenance and minor repair while some pumps are inoperative due to major failure.

Societe General du Golfe de Guinee is designated as the official franchised dealer for pump spares. Centers can be found in regional headquarters and some prefectures. Parts in stock were inventoried in Dapaong and Atakpame. Most minor parts were found to be in stock, but very few spares. There was also a marked increase in the price of all parts in Atakpame over Dapaong. Project personnel reported problems in the past in obtaining spare parts.

It is recommended that full financial and technical responsibility for maintenance of pump piston units be transferred to villagers. This responsibility should be spelled out in a document and signed by the villagers as a contract and elaborated in detail to avoid miscommunication. Social Affairs should be responsible for training piston assembly maintenance after the initial lesson given by Hydraulic Service during pump installation. At present Social Affaires encourages villagers to retain a fund for purchase of spare parts. They should encourage the villagers to use part of the fund to purchase frequently failing parts in advance, such as piston segments and pistons, instead of waiting until the parts fail.

It is further recommended that Hydraulic Service personnel, transport and equipment be increased four-fold, and a technician be placed in each prefecture as opposed to each region. The responsibility of piston assembly maintenance should be completely taken out of the hands of Hydraulic Service on all existing and future USAID project pumps. It should be noted that the current staff of technicians are impeccably trained in pump maintenance at

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the factory in France. They are extremely conscientious and dedicated and equally overworked. A strong case could be made that each pump mechanic is the best known and revered man in their respective regions.

Water Supply and Demand: Delivery Effectiveness:

A primary objective stated in the Project Paper is to provide about 30 liters of water per day per person. This quantity is widely accepted by experts around the world as a minimum quantity of water needed to maintain sanitary conditions. Studies have also shown that when available water drops below this range that quantity has a much larger influence on health than quality.

It was clearly evident that the objective of 30 liters/day/person was not being met in the vast majority of project villages. Based on the observed net pump discharges in the range of 10 liters per minute, a 12 hour pumping day, and 30 liters per person per day, one pump could theoretically serve about 250 people. However, this simplistic approach assumes an even distribution of water between users and that users have total freedom of time when they can draw water. In fact, villagers have multiple responsibilities which preclude drawing water during large parts of the day, such as working in distant fields, going to market, etc. The populations served per project pump ranged from a minimum of about 300 to well over 1000. Of the 25 or 30 pumps that were seen during all daylight hours, only three did not have a queue of water drawers, and it was noted that in these three cases there was either a general village meeting in session or it was market day. It was not uncommon to see queues of forty to fifty vessels of about 25 liters each during any time of the day. If one entered the end of this queue, he or she would wait approximately two hours to gain access to the pump. Water is carried in basins of about 25 liters from the pump to the house. For an extended family of 25 people, about 30 trips must be made to carry water based on 30 L/person/day. If this household owned six basins, they would have to queue up five times and wait about ten hours per day to draw their water. Obviously, they are forced to go short or seek an alternative source which is sure to be polluted and probably many kilometers away.

A cursory village water use survey in Avete corroborated the need to increase the number of pumps per capita served. Avete has a population of about 800 and has one project pump located on the edge of the village. Two extended families or concessions were interviewed. The first family had 51 members living in the compound and lived on the opposite side of the village from the pump at a distance of about 400 meters. This family brings about 50 liters (two basins) per day from the pump, and they arrive at dawn to avoid the queue. This provides an average of about 2 liter per day per person. In addition, about 1250 liters are carried from an open pit in a dry stream bed about 1.5 km away. Ten girls make five trips per day, providing about 25 liters per person. Many times

they are forced to use this water for drinking when they do not obtain water from the pump. The riverbed source is used by most families in the village. Each drawer wades into the pit and scoops the turbid water with a calabash to fill the basins.

The second family interviewed lives about 50 meters from, and in sight of, the pump. This family of 18 people takes about 300 liters of water per day from the pump - or 15 liters per person. Another 200 liters per day are carried from the above mentioned source to supply a total of about 28 liters per person per day.

These two cases cannot be used to represent a detailed or broad water use survey, but the figures are felt to be reliable and fairly typical of villages in this region. Water consumption figures may be somewhat higher than average due to the close proximity of the water hole to Avete. It is not uncommon for villagers to walk ten kilometers to obtain water from a much less adequate source.

Based on the above, a condition precedent set by the evaluation team for any and all following pump installations is to provide a minimum of one pump for 250 users. It is further required that project villages which do not meet the above standard be upgraded to meet it before new villages are added to the project list. It should be noted that the actual criteria is 30 liters of clean water per person per day, which can be met with pumps and/or any other satisfactory supplies. Alternative supplies are discussed in the following section.

A question which arises is - must two pumps be provided for a village of 251 people? The answer is, "yes" - and is easily justifiable for at least two reasons: First, the 250 person minimum is based on an absolute upper limit under theoretical and idealized conditions and does not provide for any growth in village population. A second justification is that a second pump serves as a spare or "fail safe" when one pump has a major breakdown. This last reason is extremely important when one considers the crisis faced by a village which perhaps lives many kilometers from an alternative source, or an old source has been abandoned and a major breakdown occurs. When evaluating the effectiveness of a village water supply project it is probably more realistic to judge it from the perspective of contingencies and the worst days faced during a year than from the perspective of average performance.

A suggestion was made to the evaluation team by the representative of FAC and FED which could greatly reduce the cost per person served by each pump and increase the effectiveness of the program. If the well casing diameters are increased from 100 to 150 millimeters (at a marginal cost per well), two pumps can be mounted per well. For the wells producing sufficient yield this could double the number of people served per well at perhaps a 20 percent increase in cost, as well as provide the safety of a back-up pump.

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It is recommended that BRGM, Hydraulic Service and FAC pursue the economic and technical feasibility of this idea, produce an appropriate design, and incorporate it into the USAID program.

As a final note on this most important section of the engineering analysis, it is stressed that if the health and economic benefits which are the objectives of this project are to be realized, a drastic reduction in the people served per pump must be achieved.

Alternate Sources:

The project under evaluation is based on drilling small-bore wells equipped with manual pumps.

The technical effectiveness and cost effectiveness would be greatly benefitted if the project scope broadened into a "village water supply" approach as opposed to a "village wells" approach. Numerous cases were seen during the evaluation where alternative sources could be exploited in place of or supplemental to wells. Many times these alternatives would provide a more technically sound water system and perhaps at a greatly reduced cost. Sixteen spring-fed perennial streams were crossed on the road between Atakpame and Palime, all flowing through or near villages with project pumps. Notable among these was the stream in Ezime. Four wells were drilled in this town of 3,000 - all of them unsuccessful. The stream flowing adjacent to this village was observed to have a flow over 100 liters per minute of clear water during the worst drought in five years. Villagers report that the stream originates in springs within a few kilometers of the village on steep mountain slopes. This situation is ideal for using a gravity water supply system with multiple outlets spaced logistically throughout the village with a central storage reservoir. Based on other projects in Togo, this type of system on this scale would cost on the order of \$50,000 depending on the local situation. Economics of scale become very significant in these systems, but are small or negligible with village wells. Even if wells could be drilled in this village a properly built gravity system is much more satisfactory from the standpoint of reliability, village participation and operation. This type of system can be installed in numerous villages in the Plateau region. It should be noted that watershed management is a very important component of these systems if they are to function well.

The old water source in Avete was pits dug in coarse sand strata in a dry stream bed. Pits dug less than one meter below the static water level yielded more water than the village of 800 can carry (perhaps 50-100 liters per minute during peak demand). This source could be greatly improved in quality and quantity by constructing a few properly designed shallow dug wells several meters deep in the

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course sand strata adjacent to the stream bed. With properly designed aprons, protection from surface water, and permanently attached communal buckets for drawing water and ropes protected from the ground, these wells could provide water of acceptable quality with much greater reliability than drilled wells with hand pumps and at a fraction of the cost.

Many places were seen where shallow dug wells or infiltration galleries could be used as alternative or supplemental sources to village wells, or possible sources where well drilling was unsuccessful.

In some cases roof catchments with properly designed cisterns might prove useful for supplemental sources. For example, a roof of a school or community center with a surface area of 500 square meters (10m x 50m) could supply about 600 to 800 cubic meters of water per year in the Plateau region. A cistern with a storage capacity of 300 to 400 cubic meters would be required and the water would meet the total needs of only perhaps 50 or 60 people.

There may be villages where it is feasible to build small water supply reservoirs with small earth-fill dams using infiltration galleries to filter the water. The infiltration gallery can be constructed in the reservoir bed and connected to a collection sump adjacent to the reservoir or at the downstream toe of the dam for a gravity feed.

It is recommended that the project broaden its scope in the future to incorporate any and all potential and feasible water sources in community water supply systems. This capability should be added at the earliest point in time that is administratively feasible, but not at the cost of reducing the rate of the currently very successful wells program. In other words, the present program should not be held up to wait for the broader scope capabilities.

It is recommended that technical assistance be used to provide necessary training and materials to Hydraulic Service or Rural Works to build the capability to assess village water needs and potential supplies, choose the most appropriate alternatives, and design, construct and maintain adequate village water supply systems. It is believed that the most expedient method of building this capability is to use technical advisors working with qualified Togolese counterparts in design and construction of various typical representative water supply systems mentioned above. Each system would be chosen based on and used as a learning and training example. Each design should be treated as an example problem and a design manual containing all the necessary steps, procedures and design data should be prepared for future reference. It is estimated that this effort will require about three years of full time technical assistance.

If such a program cannot be implemented in the near future, it is recommended that the project technical consultant (BRGM) extend their capabilities and service to include assessment of village water needs and potential sources as a prerequisite to design and construction, and to recommend alternative sources or solutions for villages where wells are negative.

Vehicle Maintenance; Social Affairs:

The health education component of the project under the Ministry of Health (Social Affairs) has about 70 project motorcycles and 7 automobiles for village agents and ministry officials.

These vehicles are being maintained and repaired in the ministry parking lot with a modest set of tools in a portable box, or by private mechanics. This has worked to date because of the newness of the vehicles, the good fortune of having a Peace Corps Volunteer who is a professionally trained and experienced motorcycle mechanic, and lack of a better alternative. It is doubtful if the Peace Corps mechanic can be replaced, and maintenance requirements will greatly increase as project vehicles grow older.

It is recommended that the project be provided with an adequately equipped workshop and an adequate staff of mechanics to maintain the project fleet.

ANNEX V A

Villages Visited

Agadjame
Adiva
Avete
Cinkasse
Dadja Chogli
Dadja
E'era
Elavagnon
Evou-betel
Ezime
Idao
Imoussa
Kotokope
Kunyohou
Lomnara
Mogou
Moussa
Nayeng
Niantougou-Kope
Tomtala
Wahala

Annex V B

Persons Contacted

USAID

Mr. John Lundgren, AAO
Mr. Paul Guild, Project Manager
Ms. Agma Prins, Project Public Health Specialist
Ms. Sarah Fry, Project Health Education Specialist

Peace Corps

Keith Coffi
Mona Ellerbrock
Phebe Prescott
Deborah Riddle
Diane Laughter
Barbara Weis
Gail Guttenplan
Jace Rizner

Government of Togo (GOT)

Mr. Ouro Tchatombi, Co-ordinateur National du Programm
Socio-Sanitaire
Mr. Nenonene Komi, Directeur du Service National
d'Assainissement
Mr. Osseni Gafarou, Directeur de l'Energie et de
l'Hydraulique
Mr. Mindamou, Project Accountant in Lome

Project Regional Directors

Mr. Agba
Mrs. Zamoura
Mr. Edohr
Mr. Mustafa

15A

Others

Dr. Michel le Joncour, Bureau des Recherches Geologiques et
Minieres
Mr. Serge De Gallaia, Chef de la mission d'Aide et de
Cooperation
Mr. C. Campens, Conseiller, FAC
Mr. Yao Amefia, Directeur de Cabinet, Ministry of
Public Works, Mines, Energy and Hydraulic Resources
Mr. Barrigah, Service hydraulique
Mr. Scott Bellard, Economic Officer, American Embassy, Lome

Agents de Promotion Sociale et Chefs de Secteurs

Mme. Assibi	Keteku Abla
Balaka Batebawia	Kpeleti Kofi
Degboevi Yao	Awlui Koukou
M. Adodo Aboflan	Amedin Sena
Tarkpessou Kossi	M. Ihou
M. Nabango	Mme. Souleymane
Madjome Tchaninibe	Hounake Kouassi Kyido
M. Degbedi	

Prefets, Prefectures of:

Amou
Haho
Kloto
Ogou
Wawa

