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TESTING TRAINING MANUALS FOR RAINWATER ROOF CATCHMENT AND SPRING CAPPING SYSTEMS IN WORKSHOPS FOR TOGOLESE DEVELOPMENT AGENTS

WASH FIELD REPORT NO. 87

JUNE 1983

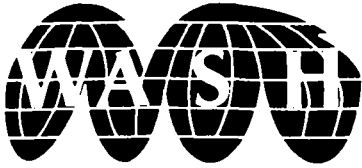
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Prepared For:
USAID Mission to the Republic of Togo
Order of Technical Direction No. 116

LO-213-0-83 TE }
RN: 04323 }

**WATER AND SANITATION
FOR HEALTH PROJECT**



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June 2, 1983

Mr. Myron Golden, Director
USAID Mission
Lome, Togo

Attention: Mr. Paul Guild

Dear Mr. Golden:

On behalf of the WASH Project I am pleased to provide you with 30 (thirty) copies of a report on Testing Training Manuals for Rainwater Roof Catchment and Spring Capping Systems in Workshops for Togolese Development Agents.

This is the final report by Henry L. Jennings and is based on his trip to Togo from January 30 to March 18, 1983.

This assistance is the result of a request by the Mission on June 4, 1982. The work was undertaken by the WASH Project on September 15, 1982 by means of Order of Technical Direction No. 116, authorized by the USAID Office of Health in Washington.

If you have any questions or comments regarding the findings or recommendations contained in this report we will be happy to discuss them.

Sincerely,

Dennis B. Warner

Dennis B. Warner, Ph.D., P.E.
Director
WASH Project

cc. Mr. Victor W.R. Wehman, Jr., P.E., R.S.
AID WASH Project Manager
S&T/H/WS

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KD 4323
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Prepared by:

Henry L. Jennings

June 1983

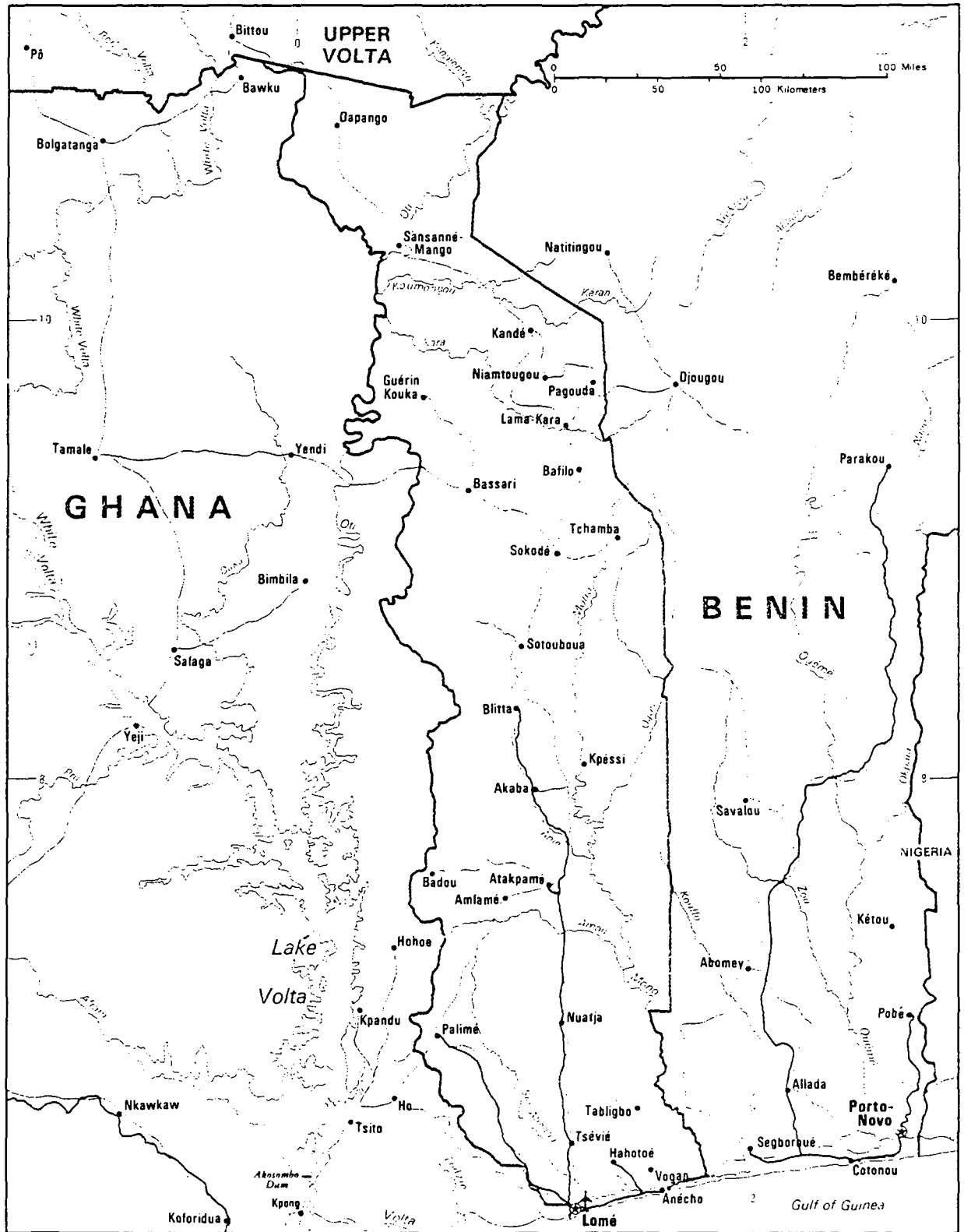
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TABLE OF CONTENTS

Chapter	Page
1. INTRODUCTION AND MAJOR LESSONS LEARNED.....	2
2. PLANNING THE WORKSHOPS.....	6
3. THE WORKSHOPS.....	8
3.1 Logistics.....	8
3.2 Participants.....	8
3.3 Staff.....	9
3.4 Schedule.....	9
3.5 Methodology.....	9
3.6 Demonstration Systems.....	12
4. ASSESSMENT OF THE RESULTS.....	14
4.1 Logistics.....	14
4.1.1 Lodging and Meeting Space.....	14
4.1.2 Transport.....	14
4.1.3 Meals and Per Diem.....	14
4.2 Participants.....	15
4.3 Staff.....	15
4.4 Training Guides.....	16
4.4.1 French Adapted Versions.....	16
4.4.2 Rainwater Harvesting.....	17
4.4.3 Spring Capping.....	21
5. CONCLUSION AND RECOMMENDATIONS.....	25
 APPENDICES	
A. Order of Technical Direction No. 116.....	27
B. Participant List for Rainwater Workshop	29
C. Participant List for Spring Capping Workshop	30
D. Resume of Participant Evaluations of RWH Workshop	32
E. Resume of Participant Evaluations of Spring Capping Workshop	36
F. Summary of Activities in Togo	39
G. Draft Technical Report on RWH by P. Leger	43
H. Draft Technical Report on Spring Capping by D. Goff	51

Togo



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Chapter 1

INTRODUCTION AND MAJOR LESSONS LEARNED

A formal request for the provision of this Technical Assistance under WASH (Water and Sanitation for Health) Project scope of work for USAID/TOGO was first made in June 1982 and finally authorized on September 15, 1982 by AID/WASH Order of Technical Direction (OTD) Number 116 (see Appendix A). The purpose of this Technical Assistance according to the OTD was threefold:

1. To install and train local personnel in the installation, operation, maintenance, and training techniques of rainwater harvesting and spring capping systems.
2. To develop a detailed training plan for the effort to be approved by S&T/H/WS before the consultants should travel to Togo.
3. To identify controls to insure that the training materials and methodology used for these efforts with the Togo trainees would result in a package of field tested materials and a methodology that can be used in other areas and countries.

In support of this effort, WASH engaged a consultant on January 18, 1983 to:

1. Review the training design and materials for both workshops independently and with those who had prepared them.
2. Make any needed revisions in the format of materials.
3. Prepare workshop sites at Mango and Badou in collaboration with all of the above persons.
4. Make final adaptations of the workshops designs in collaboration with all of the above persons.
5. Coordinate and facilitate the operations of each workshop in collaboration with all of the above persons.
6. Analyze process and outcome evaluations of each workshop and contributions to plans for follow-up.
7. Prepare a preliminary draft of proposed revisions in the training materials in collaboration with Togolese counterparts.
8. Prepare a draft report on the process of each workshop. (These two documents should be left in the field with the AID office).
9. Work with the team in Washington that prepared the

materials to incorporate the field results into a final form and finalize the process report on the workshops.

10. Participate in a general debriefing on the workshops to be held on an agreed-upon date.

The most important products of the work in Togo are revised and adapted trainer manuals in French for rainwater harvesting and spring capping. These were produced in draft form by the Togolese co-trainers and the WASH consultant in the two weeks following the end of the second workshop. A complete copy of each draft manual including all handouts and other materials was left with the Togo project and another set is at WASH. It is hoped these will form the core of the final French trainer manuals which WASH will make available to Togo and other Francophone countries.

The major lessons learned from this pilot test of the WASH Training Guides for Rainwater Harvesting and Spring Capping are as follows:

- The basic organization and the methodology followed in both guides is sound and effective in both theory and practice.
- Spring capping or spring improvement involves far more technical risks and decision-making than rainwater harvesting - so that the basic assumption of adequately preparing village level development agents to promote this technology could be questioned.
- The guides call for and definitely need to be implemented by a two trainer team: an individual skilled in community level project promotion with background in training and an individual skilled in construction and/or water engineering.
- National co-trainers should be teamed up with the WASH two-trainer team in future tests of manuals in order to increase local training skills and assure that all is done in a locally appropriate manner. This can also create additional experienced trainer resources for work in or beyond their own country.
- The WASH technical trainer should be in-country at least two weeks prior to any workshop to assure adequate demonstration site selection and preparation.
- The WASH training team should have at least 10 days to adequately prepare national co-trainers and assure adequate preparation of training site and materials.
- Village level development agents can be adequately trained in two weeks to promote rainwater roof catchment systems, especially if there is a mix of generalist and more technically trained agents as was the case in Togo.
- Training guides should be fully translated into the appro-

priate language of instruction before arrival in-country.

- More effort should be made to identify and utilize good trainers from Third World countries.
- The time is right for a practical sharing workshop or colloquium that would bring together experienced personnel from successful rural water supply and sanitation projects in West Africa.

In brief, the major successes of this effort are:

- two revised adapted training manuals in French;
- four quite skilled Togolese Trainers;
- forty trained Togolese Social Development Agents of whom at least 15 are now prepared to assist villages develop rain-water harvesting projects and all are better prepared to work with village health committees to develop needed micro-projects;
- four trained project masons who are prepared to assist agents and train village masons in construction techniques related to either rainwater harvesting or spring capping;
- one trained project iron worker who is prepared to assist agents and train village iron-workers for either system;
- a completed rainwater harvesting system at the Junior High School (CEG) in Barkoissi.

The major problems encountered include the following:

- inadequate time before each workshop to fully brief and train the co-trainers or to assure that the technical site survey, village mobilization, materials procurement and general logistic arrangements are fully and properly done;
- primarily because of the above, an uncompleted spring capping demonstration project at Totame which must be completed in the coming weeks by the Togo project;
- need to translate in-country all the rainwater harvesting training guide and much of the spring capping training guide in less than a week's time during the actual workshops;
- participant and co-trainer dissatisfaction with poor system of paying allowances;
- participant dissatisfaction at Badou because of poor housing and transport arrangements;

- the presidential visit to Badou, coupled with the order for all agents to report to their posts for a salary payment control exercise which resulted in a three-day suspension of the program;
- morale problems among agents, sector chiefs, regional directors and even the USAID contract health education advisors due to seemingly arbitrary and unjustified transfers of experienced project staff;
- lack of interest shown by the National Coordinator who, though physical present at both training sites for half the time of each workshop, probably was present no more than two hours total in actual training sessions.

Chapter 2

PLANNING THE WORKSHOP

As noted in the September 15, 1982 Order of Technical Direction (Appendix A), the original request for WASH assistance in training Togolese social affairs agents in the development of alternative water sources in villages where project wells were unsuccessful was contained in a June 4, 1982 State Department cable from Lome. Subsequently, there was a continuous flow of communications between WASH and USAID/Togo regarding possible trainers, dates, materials procurement and site selection/preparation steps that needed to be done prior to the arrival of the WASH trainer team.

The goals, objectives and design for each workshop were developed by the trainer/technician teams that prepared the draft training manuals; i.e. Daniel Edwards and Kent Keller for rainwater harvesting and Wilma Gormley and David Goff for spring capping. These same teams along with Dr. Raymond Isely and Fred Rosensweig of WASH briefed the training consultant and reviewed the previous planning cables and memoranda prior to his departure for Togo one week before the start of the first workshop.

Based on the detailed instructions received from WASH, the two USAID Contract Health Advisors to the Togo Project, Ms. Agma Prins and Ms. Sarah Fry, in collaboration with Togolese project staff made arrangements for the two training sites, transport, project masons, criteria for selecting participants, materials procurement, etc. They did a remarkably good job of pulling all these varied pieces together; however, they definitely needed some technical assistance in the identification of appropriate demonstration construction sites within close proximity to the site for housing the participants. Had such assistance been available two to three weeks before the first workshop it would probably have been possible to avoid the daily hour travel time to the RWH demonstration site and to have identified a more appropriate spring for improvement.

It should be noted that Ms. Prins did recommend that the RWH workshop be held in Dapaong where there were complete facilities and a project village within a ten minute drive, but this proved to be unacceptable to the political authority in Mango who insisted on the workshop being held in his district. If she and the Social Affairs Director for the Savanes Region had had the additional support of an "expert" consultant technician/trainer, they might have been able to successfully defend their recommendation of Dapaong. In any event, the imposition of Mango proved to be workable.

Mango is a small district center some 116 km. south of the Upper Volta border in a great savanna grassland. The trainers, Regional director, regional accountant, Ms. Fry and, at times, the National Coordinator stayed in an old military camping ground next to the

District Headquarters (Prefectures). There were two rooms with indoor plumbing and electricity from 6:30 to 11:00 p.m. plus daily temperatures above 100 degrees Fahrenheit. A large central room in the old colonial-era building served quite adequately for the general training sessions.

The 20 participant social affairs and sanitary agents stayed either in a house fixed up by the District Chief (Prefet) or with families in town. Transportation to and from the demonstration site in the large village of Barkoissi, some 30 km. north, was assured by a small bus, two covered pickup trucks and Ms. Fry's project sedan. There was also a project water truck and dump truck available for transporting supplies and the project iron worker and masons.

The training team took all of their meals together in a local restaurant and the participants ate as they chose in the market.*

It was originally planned that everyone in the spring capping workshop would have room and board plus all classroom training sessions in the comfortable Hotel Abuta in Badou which is a District Center 96 km. west of Atakpame near the Ghana border. This ultimately was not possible due to half the rooms being held for a ministerial delegation that never arrived. Thus the participants were unhappily housed in three separate places throughout the town with limited water supply and no electricity.

Several potential springs for the demonstration system had been identified in the Badou area by a Peace Corps Volunteer who had some spring capping training and the Regional Director of Sanitation. Unfortunately neither person had any practical experience with spring site identification so those they found were not ideal for the demonstration; however, because of having only three days between the arrival of Mr. Goff to select the actual demonstration site and the arrival of the participants, it was decided to try working on the small roadside spring in the non-project village of Totame. The major consideration was that it was just a 20 minute drive from the training site in Badou.

As noted elsewhere in this report, a major recommendation for future planning is that the WASH Technical Trainer arrive at least two weeks before a workshop to assure selection and preparation of an adequate demonstration site.

*It is worth noting that the WASH trainers financed the meals for the co-trainers and bi-lingual secretary at both workshops in order to maximize planning and mutual feedback time. This proved to be quite important in developing the needed trainer team rapport and coordination in the limited time available.

Chapter 3

THE WORKSHOPS

3.1 Logistics

As noted earlier, the rainwater harvesting workshop was held in the northern Togolese town of Mango and the village of Barkoissi. There was a large meeting room in the old colonial camp ground building where the trainers and administrators stayed which was used for the plenary sessions. Small group work was possible by using the veranda and corners of the large room. Some classroom sessions were also held at the junior high school (C.E.G.) and the Agricultural Training Center in Barkoissi, a 30 minute drive from Mango.

Since half the participants came from the Mango area, they were able to find their own housing around town. The others who came primarily from the central Plateau Region of Togo were housed in a refurbished house not far from the campground. The two project masons and the iron worker were housed at the district social affairs office.

Accommodations and meals for the trainer and administrators were much better at the Hotel Abuta in Badou; however, the participants in the spring capping workshop had housing inferior to that of Mango. The restaurant and lounge areas of the hotel proved adequate for large and small group work. Transportation time to the Demonstration Site in Totame was half that required for Mango and Barkoissi. Transportation of the participants was, however, less comfortable in the second workshop as the bus was no longer available. There were also more problems with transport of materials at the times needed because of a combination of problems of planning and estimation and because the project dump truck was not assigned full-time to the workshop.

3.2 Participants

There were approximately 20 active participants in attendance at each each Workshop with a nearly 50 per cent split between social affairs and sanitation agents from the two project zones, the Savanes and Plateaux Regions. Those from the Plateaux proved to be better prepared to actively participate since most had gone through at least three other project designed training sessions over the past two years whereas the others were quite new to project approaches and activities. The Plateaux agents were also better placed to see the need for alternative ways to assure clean water supply as most were working with villages that had established active health committees and were trying to define micro-projects for their village. This process had just recently

begun in parts of the Savanes.

For the rainwater workshop there were two female Togolese social affairs agents and a male Peace Corps volunteer assigned to the project in Mango. One of these women, along with another woman who also works in the Plateaux Region, also participated in the spring capping workshop.

3.3 Staff

The staff for each workshop can be divided into two groups: those who were active participants and those who were simply observers. The first group consisted of the WASH trainers, the Togolese co-trainers, the project bi-lingual secretary/translator, the four (two at each workshop) project masons, the project ironworker, the social affairs regional directors, sector chiefs and accountants and Ms. Fry in the case of the first Workshop. The latter included the national project coordinator and to some extent the regional directors of social affairs and sanitation from the Savanes who participated sporadically in the Badou/Totame spring training (see appendices for complete lists of all staff and participants at both workshops).

In addition to the above, the rainwater workshop also involved staff from the agricultural training school in Barkoissi, the Mango water authority, and the Mango district public works department.

3.4 Schedule

The workshop schedules are presented in Figures 1 and 2 in tabular form.

3.5 Methodology

The key aspect of the process followed in both workshops was the pairing of the WASH consultant trainers with two Togolese co-trainers. Since this aspect of double co-training, i.e. the WASH technical trainer and WASH methodology trainer plus a Togolese co-trainer for each aspect, was not defined during the pre-planning phase in the U.S. It was necessary to do so as soon as the first teams met. After an examination of the training background of the Togolese co-trainers which included prior participation in training of trainers, community participation and health education workshops organized by the Togo project plus their own academic and professional work experience, it was decided that the consultant trainers would try to allow the Togolese co-trainers to have as much "stand-up" training experience as possible. This decision meant that detailed review and planning had to be done for each session in order to make sure that the co-trainers understood both the content and the methodology in the training guide. This decision was further complicated in the first

FIGURE 1

RAINWATER HARVESTING WORKSHOP SCHEDULE

Monday Feb. 7 Tuesday Feb. 8 Wednesday Feb. 9 Thursday Feb. 10 Friday Feb. 11 Saturday Feb. 12

DAY ONE	DAY TWO	DAY THREE	DAY FOUR	DAY FIVE	DAY SIX
a.m. #1 Introduction to workshop #2 Developing a project	#4 Conducting a community social assessment	#6 Constructing cement mortar jars	#7 Choosing the appropriate storage and guttering technology	#8 Sizing the Tank	#10 Planning for construction
p.m. #3 Initial Technical assessment	#5 Conducting a community resource inventory	#6a Constructing jars from local material - i.e. clay		#9 Designing the system	Mid-term evaluation
Feb. 13 Day Seven	Feb. 14 Day Eight	Feb. 15 Day Nine	Feb. 16 Day Ten	Feb. 17 Day Eleven	Construction 4 →
a.m. #11 Preparation for construction	#12 Developing a plan for maintenance	#14 Critique design, refine design	#15 Making and connecting gutters	#16 Conclusion: planning of the workshop in "home villages"	
p.m.				#17 Workshop Evaluation	
→ 6 ← #13 Construction of the tank: full time (masons) 7 8 9 →					

CONSTRUCTION DETAIL: Note, because of pre-workshop construction of 3 days, construction day-4 coincides with workshop day-6.

Preworkshop: Days 1,2,&3 Day 4, Sat. Day 5, Sun. Day 6, Mon. Day 7, Tues. Day 8, Wed. Day 9, Thur

Wall construction Curing wall Wall construction Water-proofing Curing tank Connecting gutters

SPRING CAPPING WORKSHOP SCHEDULE

Figure 2

Monday Feb. 28	Tuesday Mar. 1	Wednesday Mar. 2	Thursday Mar. 3	Friday Mar. 4	Saturday Mar. 5
1. Introduction to workshop 2. Introduction to spring water development	3. Skills assessment 4. Preparation for construction activities	<u>Note:</u> Time off because of Presidential visit to Badou and convoking of agents to their posts for salary payment			5. Layout and excavation
Sunday Mar. 6	Monday Mar. 7	Tuesday Mar. 8	Wednesday Mar. 9	Thursday Mar. 10	Friday Mar. 11
6. Form building and reinforcement 7. Mixing, pouring and curing concrete	8. Community selection 9. Community participation	10. Installation of wall and pipes Mid-term evaluation	11. Survey methods and data collection	12. Operation and repair 17. Alternative technologies - Work at site	15/18. Planning spring capping projects - Work at site
Saturday Mar. 12					
16. Evaluation of demonstration 17. Evaluation of workshop					

workshop by the fact that none of the session plans had been previously translated into French. All the handouts for the participants had been translated, but not the directions for the trainers. Fortunately this handicap was overcome by the untiring efforts of the USAID Health Education advisor to the project, Ms. Sarah Fry, who cheerfully added translation work to her already full schedule of responsibilities.

After individual and joint review of each session, a mutual decision was reached on who would be responsible for the delivery of each step in the session. Since the goal was to have the Togolese do as much as possible in order to increase their training experience and skills, they were encouraged to perform any step that they felt they could handle after our review together. Thus well over 50 per cent of all presentations and facilitation tasks were done by them.

Another facet of this co-training was the forming of the technical and the methodological training teams. As a result the former was able to spend the time necessary preparing and supervising work at the demonstration sites while the latter handled the more general aspects of the training such as community social assessment, community resource inventory, etc.

A serious attempt was made to follow the sessions as designed in the two pilot training guides as intended and desired by WASH. Both guides proved to be quite usable, but the local realities did demand some modifications that were made after consultation with the WASH Trainers. The vast majority of these changes were in technical sessions that were deemed to be overly complex, primarily in the case of rainwater harvesting, or difficult to follow exactly because of problems at the demonstration work site and interruptions primarily of the spring capping workshop. (The draft notes in the Appendix G from the WASH rainwater harvesting technical trainer elaborates on these changes and more will also be said in the following chapter.)

As noted in the introduction to the rainwater harvesting manual, the methods used depend on the active participation of the agent trainees who must be willing to try out activities, reflect upon and "process" these activities and derive generalized learning from this process which can be applied later to their work settings. Theory was provided through "lecturettes" by a trainer, guided discussions, flip charts and written handouts. The theory was always then put into practice through role plays, simulations, case studies, surveys, field demonstrations or actual field work. Most importantly, the participants had to practice their learning in actual communities where demonstration systems were constructed.

4.6 Demonstration Systems

The rainwater harvesting system was constructed for the 230-student junior high school in Barkoissi. It used half of the

corrugated tin roof of the school or 220 square meters of surface for the collection of rainwater. Half circle gutters were constructed from corrugated metal sheets, welded together and hung on 60 cm. bent iron bars along the 44 meters of the school roof. A reinforced concrete half-submerged reservoir with a total capacity of 19.2 cubic meters was constructed at one end of the school. Total construction time for the complete system was 13 days.

The spring capping system was attempted on a small mountain roadside spring in the tiny non-project village of Totame. The hillside was excavated to expose five small flows which were then captured behind a clay interior retaining wall. A nearly two meter stone and mortar retaining wall was then built on a reinforced concrete foundation. One low pipe for the dry season, two mid-level pipes for the rainy season and an overflow pipe were installed. Diversion ditches were begun and the entire site behind the stone retaining wall was filled in with bolders which subsequently had to be removed when a leak developed around the retaining wall. The Togolese co-technical trainer was to return to the site with a work force to try again to make the system operational.

Chapter 4

ASSESSMENT OF THE RESULTS

4.1 Logistics

4.1.1 Lodging and Meeting Space

Even though the housing and meeting room facilities in Mango were spartan, they were adequate for the needs of the workshop. because the extreme heat and the need for the trainers to work late each evening to prepare flip charts and strategy for the next day, it would be preferable although not essential to hold future workshops where there is 24 hour electricity.

It would also be better to not use a hotel restaurant as the main meeting room without full and exclusive use of it throughout the workshop. Certainly more attention and concern should go into the housing for participants. It is extremely hard to keep up morale after spending a night on a broken camp bed in a house full of mosquitoes and with inadequate water for bathing--which was the case for some in Badou.

As a general rule, fairly comfortable and pleasant housing and meeting space should be found for any two week workshop if people are expected to be "up and ready" to fully participate. The validity of this rule in Togo was demonstrated by the extremely positive memories the agents had of their training of trainers workshop which was held at a small farm hotel complex. Clearly the conditions had contributed to their ability and willingness to work hard and to learn.

4.1.2 Transport

It was extremely useful to have a 20 passenger bus available throughout the Mango workshop to transport the participants. This should be planned for in all future workshops where the field work is some distance from the lodging or classroom location.

There should also be a dump truck, a pick-up truck, and at least one other vehicle available full-time for either one of these workshops. This recommendation also implies drivers and adequate provision for fuel. If administrators or other persons are visiting the workshop for any reason they should have their own transport and not use vehicles needed for the training for their own personal or other work use.

4.1.3 Meals and Per Diem

Since it is important that the WASH trainers take their meals with

the national co-trainers, common meals should be planned for future workshops. The co-trainers should also receive the same per diem if they are doing the same work, and likewise all participants should receive equal per diem if they are all trainees for the workshop period.

There were more complaints about the different levels of per diem (which depended on administrative level rather than role in the workshops) and the late or partial payment of per diems and travel reimbursements than about any other factor. Poor housing and transport for participants was the next major complaint.

As another general rule, a workshop facility that allows everyone to sleep and eat in the same area permits more opportunity for sharing and learning together. At the same time, many agents will probably prefer to collect their per diem and make their own arrangements for subsistence in order to save some extra money.

4.2 Participants

The two USAID contractor advisors to the Togo project did stress that participants should be selected on the basis of their potential to apply either of the technologies in their project villages. This criterion was generally respected in the selection of participants from the Plateau Region, but not so rigorously for those from the Savanes. It was particularly unfortunate that all of the sanitary agents from the north, except for one, came from the town of Mango and had no responsibility to work with project villages.

For future rainwater workshops there should continue to be a mix of social affairs or health extension agents and rural sanitation or water supply extension agents. They should be responsible for assisting villages where other preferred systems of drinking water supply (i.e. boreholes, improved open dug wells, or springs) are not possible or not adequate to meet the drinking water needs of the population.

For future spring capping workshops an attempt should be made to train a higher level of technical personnel such as water engineers in spring site assessment and design of improvements. The lower level development or extension agents can continue to be trained in aspects of spring site construction community preparedness, participation, sanitation, and general preventive health approaches; however, it is questionable whether such agents can be adequately prepared to assess spring sites and design appropriate improvements.

4.3 Staff

This experience has demonstrated that very fine training skills exist in Togo. USAID, Peace Corps, CUSO, WASH, and other international organizations or national ministries that are

interested in training personnel in either rainwater harvesting or spring capping project development should know that there are now Togolese trainers capable of running such programs. These same trainers, plus others in the Togo project, are also capable of providing training in other areas such as training of trainers, community mobilization and participation, and helping health workers learn. Beyond this group, there are many skilled Togolese and other African trainers who have had extensive training experience over the years with Peace Corps and other organizations. An effort should be made to identify more of these people through organizations like Peace Corps Regional Training Resource Office for Africa which is based in Lome or African Training Centers such as those in Bobo-Dialasso, Upper Volta, and Buea, Cameroon. Once identified they should be used as much as possible for the training of their fellow Africans or even expatriate assistants.

National co-trainers should be selected on the basis of their proven ability to deliver effective stand-up non-formal training. The Togo project is fortunate to have an impressive pool of such people secondary to the great emphasis that has been placed on training. There still is, however, a lack of understanding among some project administrators regarding the skills needed to be an effective process trainer. These people would still tend to select trainers on the basis of their administrative rank, age, sex or ethnic background rather than on their proven training skills. More effort needs to be made to modify such attitudes.

As noted earlier, more time should be planned for in the future for preparing the national co-trainers, the masons and other skilled workers, the demonstration villages and the actual construction site. As a minimum this preparation should require two weeks in-country prior to the workshop for the technical trainer and at least a week for the process or methodology trainer. Also all materials that the co-trainers need to use should be translated in advance if they do not know English.

Following the example of the Mango workshop, serious attempts should be made to involve local technical resources in the training such as Public Works, the Weather Service and water technicians. Involving these organizations not only provides additional local expertise, but also enables these technicians to meet participants who can then call on them later for assistance.

4.4 Training Guides

4.4.1 French Adapted Versions

In order to carry forward the process of up-grading the skills of the Togolese co-trainers and at the same time leave the Togo project with useful training materials for future workshops, it was decided after checking with WASH, that the methodology consultant would work on the guides with the Togolese trainers for the two weeks following the end of the second workshop. These

sessions proved to be a very effective, practical, and productive workshop on how to prepare a complete training guide that includes detailed instructions for the trainers as well as materials destined for the participants. The end result is two draft training guides in French and four Togolese trainers who now have basic skills in training design and materials preparation. A complete guide for each workshop has been left with a draft report in Togo and duplicates are at WASH for review by the two technical trainers and others in the hope that they will form the essence of training manuals that WASH can produce and disseminate to other Francophone countries.

It should be noted that these guides in French reflect most of the changes or adaptations that were made in the original draft guides in English during the course of each workshop. In order to prepare revised guides in French, the co-trainer team for each workshop worked through each session by reviewing the flip charts that had been used for the session, the original rough translation done in-country of the draft guides in English, their own notes, the participants' evaluation sheets and the notes taken by the training consultant. It was a monumental task for five people to complete in ten working days, but they did it quite well. What is needed to make these guides in French really complete and of high quality is a review of the technical sessions by an experienced French speaking technical trainer familiar with the draft guides in English.

For the Togo project, it would be very helpful if Mr. Leger reviewed and added to the guides in French that the co-trainers produced and that then WASH print and send to Togo at least ten copies of each guide. Some additional copies could also be printed so that they could be made available to other Francophone countries who request them.

For the world at large, the revised guides in English should probably be field-tested one more time before moving to a mass printing and distribution. This recommendation applies at least to the spring capping guide. An ideal second test of the rainwater harvesting guide would be in another Francophone country where the trainers could work both from the revised guide in English and the one in French. It would be ideal if one of the Togolese co-trainers could serve on the training team for such a second test.

4.4.2 Rainwater Harvesting Guide

A detailed review of how the guide worked or was adapted during the Togo training has been passed on to the original author Dan Edwards. He is in the process of revising the guide to reflect the suggested changes. For the most part, these revisions are not major. The basic draft design worked, in fact, quite well as did the general sequencing of sessions and activities. Thus most of the changes are more in the nature of additional notes to trainers, adjustments of timing for some activities, expanding the

list of materials needed for each session, etc. Some sessions, such as No. 4 which uses a role play as part of the training in how to conduct a community social assessment for a rainwater harvesting project, worked extremely well with no modifications. The same was true for Session No. 11 on community participation. The Togolese could not believe that the case study used in this session was written by someone who had never been to Togo. It was most effective.

More substantive changes were made in the purely technical sessions since the drafts seemed generally to be unnecessarily complex and difficult to use with village level agents. The following is a summary of the major recommendations made for a revised Guide:*

1. Session 1: Introduction to the Workshop

This section should include an introduction to the technique of rainwater harvesting as a system for providing potable water to villages. This introduction should include the following:

- a. the role of this technology in the context of the Togo (or other country) rural water supply and sanitation project
- b. the advantages and disadvantages of this technology as opposed to other ways to provide potable water (quality, quantity, accessibility, cost, etc.)

2. Session 2: Developing a Rainwater Harvesting Project

This plan should begin by an introduction of the model on which the workshop is designed. This model consists of three key parameters for the development of an appropriate project:

- a. the technical feasibility of the project
- b. the social acceptability of the project
- c. the economic feasibility of the project

These parameters result in options that should be discussed with villagers before they arrive at a decision on the choice of technology to use for any project.

3. Session 3: Initial Technical Assessment

A visit to a weather station that has a rainwater measuring gauge should be included. The technician from the station should demonstrate how rainfall is measured and explain the uses made of the monthly and yearly rainfall data.

*Many of these are from Pierre Leger's Technical Report submitted to the Togo Project on February 22, 1983--see Appendix G.

4. Session 4: Conducting a Community Social Assessment for a Rainwater Harvesting Project

Option one for a 2-1/2 hour session worked very well so should be used rather than the alternative 4-1/2 hour session.

5. Session 5: Conducting a Community Resource Inventory

This session works well as designed and can be split between the second half of the morning on day 2 and the afternoon.

6. Session 6: Demonstrating the Building of a Small Storage Tank Using Concrete

The instructions for making the mold from gunny sacks was incomplete in that the recommended height of the jar was not given in the construction guide. This omission was corrected and a recommendation made to follow this session with a visit to a local maker, if such exists, of traditional storage jars so that a comparison can be made between this new technology and a traditional one.

7. Session 7: Choosing the Appropriate Storage and Guttering Technology

Add an explanation of all the social and technical steps taken to date at the demonstration site.

8. Session 8: Sizing the Tank

No major changes.

9. Session 9: Designing the System

In step 3 add an exercise where 3 groups have to calculate materials needed for a square, rectangular or circular tanks.

10. Session 10: Planning for Construction

This session should define the roles of planning, organization and management in construction activities as well as develop the methodology for planning, organizing and managing these activities. For the planning of activities, a matrix should be prepared that shows the time needed, resources required, and approximate cost for each activity. Also a plan of action should be prepared that shows all steps that must be followed in realizing a rainwater harvesting project.

11. Session 11: Preparation for Construction: Community Participation

No changes suggested.

12. Session 12: Developing a Plan for RWH System Maintenance and Monitoring

An explanation of monitoring and maintenance of a system followed by a discussion should be planned for. Then a plan for monitoring and maintenance should be developed. This plan should include the elements to inspect in the system, the persons responsible, the monitoring tasks, the repair work, the material necessary and the organization of maintenance activities.

A special lecturette should be given on disinfection of systems and of water in cisterns, followed by a field demonstration where an existing well or cistern is disinfected--as well as the demonstration system when it is complete.

13. Session 13: Construction of the Tank

Activities of this session must begin at least four days before the beginning of the workshop. A complete record should be kept of all activities undertaken during the period of construction. This record should include the exact time spent, the human and material resources used and any pertinent observations concerning the execution of the work for each construction activity. This can then help in the evaluation of the project (planning, organization, management, and execution).

14. Session 14: Critiquing and Refining the System Design

This session should also include a technical, social, and economic evaluation of the demonstration system. This evaluation should be done by a specific analysis of the observed factors that aided or hindered each of the three aspects (technical, social, economic) of the project. Then appropriate solutions should be proposed in order to improve the technology in its conception, acceptance and cost.

15. Session 15: Making and Connecting the Gutters

The design of the guttering and foul flush systems must be complete by the end of week 1 so that there is adequate time to have them made and installed.

16. Session 16: Planning Applications of the Workshop in "Home" Villages

No significant changes suggested.

17. Session 17: Workshop Evaluation

The evaluation is fine as designed. There should, however, be a mid-point evaluation added between session 10 and 11. This step was taken in Togo and will be incorporated into the revised guide.

4.4.3 Spring Capping Guide

Like the RWH manual, the basic draft design including the general sequencing of sessions and activities worked well. What did not go well was the actual demonstration construction site. The additional time that this site demanded adversely affected the ability of the technical co-trainers to fully follow the sessions as planned in the second week. The schedule was further complicated by the loss of three training days in the second week because of an unexpected presidential visit to Badou and the need for the participants to return to their posts for a salary control exercise. Two of these days were made up by working Sunday and through the second Saturday, but the schedule was still one day short of the original schedule. To accommodate this situation, session no. 15, planning for spring capping projects, and session no. 18, planning for your first spring capping project, were combined into one three hour session. Session no. 13, health education for spring users, was dropped completely since the Togolese agents had already had considerable training and practice in health education. Session no. 16, evaluating the demonstration spring capping project, was also not fully covered since the demonstration project was not completed.

It is worth noting that this training would have been a total failure if only one trainer had been expected to deliver the full training, as is so often suggested. Both manuals depend on a co-trainer team as there are at least three levels of training taking place simultaneously: the training of the agent participants, the training of the project skilled workers (masons and iron worker), and the training of village workers. This means that the technical trainer must spend considerable time planning, organizing, and supervising the work at the demonstration site while the methodology trainer is conducting sessions with the participants.

The most fundamental question that needs to be answered regarding the spring capping manual is whether one can succeed in adequately preparing field agents (social promotion agents or sanitarians) to assess potential spring capping sites and to design improvement systems for each spring that will work. The Togo experience suggests that this may be an unrealistic goal. A more workable solution might be to provide experiential training in spring site assessment and design for experienced water or construction technicians who can serve as technical advisors or technical resources to field agents who are assisting villages with spring capping projects. The agents could then be prepared to facilitate all other aspects of project promotion and execution (construction) at the village level. This restructuring could be accomplished by using most of the sessions in the to-be-revised training guide. The following are the major recommendations for revising the Guide:

1. Session No. 1: Introduction to Spring Development Workshop

Add a definition of a spring in step 3 before presenting the goals of the workshop. This is particularly necessary in French where the word source can mean either a natural source of water coming out of the ground or any water source. Also include an explanation of spring capping as a system for providing potable water. This explanation should include the advantages and disadvantages of spring capping as opposed to other ways of providing potable water. Otherwise the session worked well as designed.

2. Session No. 2: Introduction to Spring Development

With the exception of there not being an improved spring in the area to inspect, the session worked well as designed. What should be added is a visual explanation of facets of improvement in capped springs to be used if an improved spring is not available and more discussion on the risks you must share with villagers when attempting any spring improvement project. Also, the many handouts for this session should be reviewed, edited, and condensed so as to avoid duplication and generally reduce the reading lead. This last recommendation applies generally to all handouts in the guide.

3. Session No. 3: Skills Assessment for Spring Development Technologies

This session worked well as designed. Unfortunately a second completion of the self-assessment of skills was not done at the end of the workshop because of time pressures connected with the problems at the demonstration site. This step should definitely be taken in future workshops.

4. Session No. 4: Preparation for Spring Development Construction Activities

This is a crucial session that seemed to work well when it was presented. However, the later problems encountered in executing the design made for the demonstration spring raise questions about the session. It should probably be redesigned for two different levels of participant, one level more detailed and with more opportunity to consider different design options geared for experienced water or sanitary technicians and another more simplified explanation of the basic construction activities for field agents.

5. Session No. 5: Layout and Excavation

The session works well as designed. It should, however, be preceded by sessions like Nos. 4 and 5 in the rainwater harvesting manual, i.e. conducting a community social assessment for rainwater harvesting and conducting a community resource inventory or sessions 8 and 9 of this manual. This modification would help to emphasize the extreme importance of attaining village ownership

of the project and of assuring active participation by village skilled and unskilled workers as well as local materials. All of the above were lacking at Totame since it was not a project village and there was inadequate time to educate the village leaders and thus assure village participation.

6. Session 6: Form-building and Reinforcement

For the preceding session, this one and all others that involve actual construction activities one should pair up the social affairs agents with counterpart sanitation agents. This pairing should establish working teams that can be supportive of each other after the workshop. The basic session design works and needs only a concluding step to assure that the objectives have been achieved.

7. Session No. 7: Mixing, Pouring and Curing the Concrete Foundation

The design worked as written. A note should be added regarding the importance of discussing with the Project masons in advance the reasons for using different proportions of sand, cement and gravel when preparing concrete for structures to contain water.

8. Sessions Nos. 8 and 9: Community Selection and Decision Making; Community Involvement; Organizing the Community to Participate

These are well-designed sessions quite similar to Sessions Nos. 4 and 5 in the RWH manual. As noted in item 5 above, they should precede the sessions where actual construction activities begin.

9. Session No. 10: Installation of Spring Retaining Wall and Pipe

As noted in item 7, it is most important that the project masons understand and are in agreement with what is going to be done before the participants arrive at the work site. Generally the session seems sound as designed.

10. Session No. 11: Village Survey Methods and Data Collection for Spring Site Selection

No major revisions suggested other than reviewing and condensing the session handouts.

11. Session No. 12: Operation, Maintenance and Repair

Other than adjustments in the timing of some steps no major changes.

12. Session No. 13: Health Education for Spring Users

As noted earlier, this session was not tested in Togo. It appears to be well designed.

All of the remaining sessions were considerably altered, combined, or shortened because of the site completion problems discussed earlier. Thus it is not possible to make an assessment of the workability of the original designs. The one exception in Session No. 19: Workshop evaluation, which worked well.

Chapter 5

CONCLUSION AND RECOMMENDATIONS

"This training has not only been valuable for my work in the project, it has also given me practical skills that I will use for the construction of my home which will have a rainwater roof catchment system. I am grateful to all the trainers and organizers of this workshop."

The remarks above were made by one of the participants in the rainwater harvesting workshop, and they capture a bit of the general enthusiasm of the participants in that workshop. Those who took part in the spring capping workshop were also quite positive about the classroom sessions and the general learning atmosphere established, but they were understandably disappointed that the demonstration site was not completed. Nearly everyone felt that the workshops did increase their skills and ability to assist village health committees define and undertake micro-projects that would have a positive effect on village health conditions. They also appreciated the mixture of training techniques and the balance of theoretical and practical learning.

The results for the Togo Project should be more effective work by the agents with their various village health committees and several subsequent attempts to promote and execute rainwater harvesting projects. It is possible, but unlikely, that some attempts will also be made to promote spring capping projects. Thus the AID/Washington Office of Health should continue their good communications with the Togo project and be prepared to offer additional assistance as the needs are defined over the coming months.

Since the major lessons learned, successes, and problems encountered during this assignment have already been stated in the introduction, they will not be repeated here. The same applies to recommendations made in other chapters of the report. Thus the following are other miscellaneous recommendations that have not been mentioned before or need additional emphasis:

5.1 Rainwater Harvesting

1. Since this pilot test used a demonstration system composed of a roof and gutters made of corrugated tin sheets and a reinforced concrete storage tank, future workshops should try to use other materials and designs. If these field trials are then fully documented by noting the cost of the system and the advantages or difficulties encountered, it could help in the preparation of recommended standard plans for different regions.
2. It would likewise be desirable for the Togo Project to

develop standard design plans so as to minimize the technical decisions that the field agents must make.

5.2 Spring Capping

1. Be certain that the training site is located in a project village in very close proximity to a spring that can be successfully capped within a two week period.
2. Seriously, reconsider with other experts in spring capping what can realistically be achieved in a workshop depending on the level and experience of the participants.

5.3 Togo Project

1. Indiscriminate transfers of ministry staff in and out of the project is affecting staff morale and could affect negatively on the achievement of project objectives. As part of the conditions for extending the project, USAID/Togo should insist that formal procedures be agreed upon regarding the posting of the staff to the project.
2. Lack of involvement and thus lack of knowledge regarding the project's successes and problems on the part of the project's national committee members and even the National Coordinator are also adversely affecting staff morale. This problem has been highlighted by the recent evaluation of the project and will hopefully be addressed successfully by the USAID/Togo Mission and concerned Togolese officials.

In conclusion, much appreciation is due to the dedicated staff of WASH, USAID/Togo, and the Togo Project for making this such a rewarding and satisfying experience. May these efforts bring better conditions to villagers of Togo!

APPENDIX A

Water and Sanitation for Health (WASH) Project
Order of Technical Director (OTD) Number 116
September 15, 1982

SEP 16 1982

TO: Dr. Dennis Warner, Ph.D., P.E.
WASH Contract Project Director

FROM: Mr. Victor W. R. Wehman Jr., P.E., R.S. *VWR*
AID WASH Project Manager
AID/S&T/H/WS

SUBJECT: Provision of Technical Assistance Under WASH Project
Scope of Work for USAID/TOGO.

REFERENCES: A) Lome 3186, dated 4 June 1982
B) WASH Project Interim Report No. 1 (June 1982) for
WASH/TOGO OTD No. 91
C) WASH Telex No. 286, dated 30 July 82
D) Lome 4560, dated 6 Aug 82
E) Discussions between Isely and Hafner (WASH)/Isely and
AGMA Prins (USAID/Togo) and V. Wehman (S&T/H/WS)

1. WASH contractor requested to provide technical assistance to USAID/Togo as per Ref A, para 2 and Ref D., para 1.
2. WASH contractor/subcontractor/consultants authorized to expend up to 105 person days of effort over a four (4) month period to accomplish this technical assistance effort.
3. Contractor authorized to expend up to 95 person days of international and/or domestic per diem to accomplish this effort.
4. Contractor to coordinate with USAID/Togo (Ms. Prins), Togo Desk Officer, AFR/TR/HNP (J. Shepperd), AFR/TR/ENGR (J. Snead), Togo Rural Water Supply and Sanitation Project Officer in AFR/PD/ and should provide copies of this OTD along with periodic progress reports as requested by S&T/H and AFR Bureau staff.
5. Contractor authorized to provide up to three (3) international round trips from consultants home base through Washington to Togo and return to consultants home base through Washington D.C. during life of this OTD.
6. Contractor authorized local travel within Togo as appropriate and necessary to carry out this technical assistance effort NTE \$1200 without the prior written approval of the AID WASH Project Manager.
7. Contractor authorized to obtain local secretarial, graphics or reproduction services in Togo as necessary to accomplish tasks. These services are in addition to the level of effort specified in para 2 and 3 above.
8. Contractor authorized to expend up to \$3,200 for the development, testing, and printing of the training materials for the spring capping, rainwater harvesting training sessions and any field materials (concrete, lamina, wood, plastics, etc.) needed for practical performance testing. Contractor authorized to conduct actual hands on rainwater harvesting/spring capping field demonstrations involving construction of actual physical field installations.

9. Contractor authorized to provide for car/vehicle rental if necessary and appropriate for the effort. Mission is encouraged to provide mission vehicles and local logistics support if available.
10. Contractor authorized to install and train locals in the installation, operation and maintenance and training techniques of rainwater harvesting/spring capping systems at sites agreeable to and with the approval of the AID mission liaison officer (Ms. Prins).
11. WASH contractor will adhere to normal established administrative and financial controls as established for WASH mechanism in WASH contract.
12. WASH contractor should definitely be prepared to administratively or technically backstop field consultants and subcontractors.
13. New procedures regarding subcontractor cost estimates and subcontractor/consultant justifications remain in effect.
14. Contractor to develop a detailed training plan for effort to be approved by S&T/H/WS (Dr. John Austin) before consultants are to travel to Togo. Training plan should address preparations, coordination, training sequence, agenda, types of performance demonstrations in the field, and identify controls to insure that the training materials/methodology used for these efforts with the Togo trainees will result in a package of field tested materials and methodology that can be translated and applied in many other country/geographic situations. Contractor to leave a draft report with the mission before leaving the country. Final report due to S&T/H/WS within 30 days of consultant debriefing in Washington D.C.
15. Mission should be contacted immediately and technical assistance initiated as soon as convenient with mission.
16. Appreciate your prompt attention to this matter. Good luck.

PROJET USAID - TOGO No; 693 - 0210
PROGRAMME DE DEVELOPPEMENT SOCIO-SANITAIRE

RAINWATER HARVESTING WORKSHOP

SEMINAIRE DE FORMATION EN COLLECTE D'EAU
DE PLUIE A MANGO
DU 6 AU 19 FEVRIER 1983

LISTE DES PARTICIPANTS

1. Mr OURO-BAWINAY Tchatomby - Coordonnateur National du Programme de Développement Socio-Sanitaire, Directeur du Séminaire.

ENCADREURS

2. Mr AGBA T. Akoloum - Directeur Régional des Affaires Sociales et de la Condition Féminine des Savanes-Dapaong.
 3. Mr MAMA Abdoulaye - Chef Secteur Affaires Sociales et de la Condition Féminine de l'Oti - Mango.

CO-FORMATEURS

4. Mr DAGBEGNON Mawuli - Direction Régionale des Affaires Sociales et de la Condition Féminine des Plateaux-Atakpamé.
 5. Mr DJIDO Hounaké - Affaires Sociales - Anié.

ADMINISTRATION

Secrétariat

6. Mr KOULA Amissa - Secrétaire Bilingue, Projet USAID-TOGO, Lomé.

Comptabilité et Logistiques

7. Mr AWOUKOU Amouzou - Comptable, Direction Régionale des Affaires Sociales et de la Condition Féminine des Savanes - Dapaong.

PARTICIPANTS

- | | |
|-------------------------|---------------------------|
| 8. Mr KPELITI K. Kuma | 9. Mlle AGOUSSE Assiby |
| 10. Mr AWLUI Kokou | 11. Mr DOGNON Kodjo |
| 12. Mr DORVI Kossi | 13. Mr TATADEKU Séenam |
| 14. Mr OURO-AKPO Kadiri | 15. Mr PAIDRA Tissoga |
| 16. Mr DJABEY Kossi | 17. Mr DOUMEGNON Kossi |
| 18. Mr FIATY Anani | 19. Mr AKOH Nanda |
| 20. Mr NEIL Boyer | 21. Mr KOMANA Mélam'Ni |
| 22. Mr KOUNTOUTI Lendi | 23. Mme DOSSA Ama |
| 24. Mr GBEKE Djogbé | 25. Mr EZAO Kenguémou |
| 26. Mr ZOUMBO Komla | 27. Mr KOUGBLEGNA Komlavi |

PROJET USAID - TOGO No. 693 - 0210
PROGRAMME DE DEVELOPPEMENT SOCIO-SANITAIRE

(SPRING CAPPING WORKSHOP)

SEMINAIRE DE FORMATION EN AMENAGEMENT DES SOURCES
A BADOU DU 27 FEVRIER AU 13 MARS 1983

LISTE DES PARTICIPANTS

1. Mr OURO-BAWINAY Tchatomby - Coordonnateur National du Programme de Développement Socio-Sanitaire, Directeur du Séminaire.

ENCADREURS

2. Mr AGBA T. Akoloum - Directeur Régional des Affaires Sociales et de la Condition Féminine des Savanes-Dapaong.
 3. Mr EDORH A. Seme - Directeur Régional d'Assainissement des Plateaux - Atakpamé.
 4. Mr ISSAKA Moustapha - Directeur Régional d'Assainissement des Savanes Dapaong.
 5. Mme ZOUMARO Ikpindi - Directrice Régionale des Affaires Sociales et de la Condition Féminine des Plateaux-Atakpamé.
 6. Mr TSOGBALE Mawouna - Chef Secteur Affaires Sociales et de la Condition Féminine- Badou (WAWA)

CO- FORMATEURS

7. Mr MADJOME Tchanimbé - Superviseur Régional des Plateaux-Atakpamé.

ADMINISTRATION
Secrétariat

8. Mr KOULA Amissa - Secrétaire Bilingue, Projet USAID-TOGO Lomé.

Comptabilité et Logistiques

9. Mr TCHEDRE Awissih - Comptable, Direction Régionale des Affaires Sociales et de la Condition Féminine des Plateaux - Atakpamé.

PARTICIPANTS

10. Mlle AGOUSSE Assiby - Atakpamé (PLATEAUX)
 11. Mr DEGBOEVI Y. Sena - " "
 12. Mr AGBAGNON M. Dovi - Kpalimé (KLOTO)
 13. Mme SOULEYMANE Ramatou - " "
 14. GNAMASSOU Awoukou - Bénali (WAWA)
 15. EMEFA Kossi - Notsé (HAHO)
 16. AMEDIN M. Séna - Amlamé (AMOU)

17. AZIATROGA Togbé Adjrah - Kpugnohou (WAWA)
18. Mr AZOLI Kpélou Sénamé - Tomegbé (WAWA)
19. Mr ATIVO Kokou Bléwunyo - Tandjouaré (TONE)
20. Mr AWI Abalo - Kpalimé (KLOTO)
21. AGBOKPA Atsou M.Gavo - Dapaong (TONE)
22. ANAWI Tchao Pawbadi - Tohoun (HAHO)
23. KULO Sanda Bawumontom - Naki-Est -Dapaong(TONE)
24. MAMA Abdoulaye - Mango (OTI)
25. OURO-AKPO Kadiri - Gando (OTI)
26. DAOUDOU Alassani - Dapaong (TONE)
27. PAIDRA TIssoga - Barkoissi (OTI)
28. KOUGBLEGNA Komlanvi - Atakpamé (PLATEAUX)
29. SOUKOUROU Kodjo - Atakpamé (PLATEAUX)
30. ZOUNBO Komla - Atakpamé (PLATEAUX)

Session #13: To learn the basic steps and processes in larger (community) storage tank construction.

1 (1) 2 (1) 3 (7) 4 (7) 5 High
Low

Session #14: To critically examine the tank design under construction and refine it for future use.

1 2 (4) 3 (6) 4 (7) 5 High
Low

Session #15: To learn how to construct and connect gutters.

1 (1) 2 (4) 3 (5) 4 (6) 5 High
Low

Session #16: To plan applications of the workshop to the work setting.

1 2 (4) 3 (7) 4 (5) 5 High
Low

B. Workshop Feedback and Learning: Please answer the following questions as fully as possible so that the trainers can learn how effective the workshop methodology was.

1. What have been the most positive things about this workshop? Comments: Calculation of material needs; inventory of local resources; steps to follow in building a cistern; trainers took time to explain all questions; all was very positive because we achieved all goals; organization and pedagogy; positive atmosphere; mutual respect; all positive especially the practical work; trainers are to be congratulated; review and explanations after mid-evaluation; availability of trainers and effective participation; tolerance/patience; team spirit; rich learning; liberty of expression
2. What have been the most negative things about this workshop? Comments: lack of discipline by some participants; not seeing gutters fully installed; everything was important and useful; cement jars that were barely achieved; non-participation by some seminararians; extreme heat; nothing negative; lateness by some participants; learned many things helpful for my work so no negatives

3. What one thing stands out as important to you in this workshop? Comments: Calculating material needs; inventory of qualifications, techniques and local materials; making list of resources; building the tank; everything important; conception of the RWH system; maintenance procedures; methodology to follow to develop a RWH system; how to choose most appropriate technology; work plan; social eval.
4. What things have you learned that you did not know before? Comments: most technical things; calculating rainfall one can collect from a roof; disinfection of a tank or well; planning of any project; design of type of tank; calculations; everything; constructing cement jar; mixing concrete and mortar; technical evaluation; work plan; estimating cost of the system

C. Workshop Organization and Training

1. What comments do you have about the way the workshop was planned and organized? Very well; OK but need more discipline for some participants; all went well but too much travel was tiring; everything good; congratulations but make next one longer; very good; participants invited very late; too short; perfect organization
2. What can be done in the future to improve a workshop like this? Take away the heat; invite participants earlier; work site nearer to lodging; increase length; have participants do more manual labor; inform village sooner; distribute document after workshop; choose participants on basis of relevance to their work
3. What specific steps in developing a rainwater harvesting system do you feel you will need to learn more about in order to successfully promote and develop a project in the future? How to estimate total cost and disinfection methods; nothing; generally adequate but should have some follow up; calculation of material needs; harvesting from thatch roofs; design of the system; work plan; correct dosage of chlorine for disinfection
4. What comments do you have about the trainers? No problems, all was clear and they were very accommodating but the local administrators are dishonest; always working conscientious about their work; organized workshop very well; National Coordinator didn't consider us even though we waited for him patiently; only re-preached local leaders who didn't participate; very good, thank you; very nice; congratulations; patient and enthusiastic

Resume of Participant Evaluations

Evaluation Form - Spring Capping

(Please do not sign your name)

(Workshop in Badou, Togo, 2/28 - 3/12/83 with 18 Respondents)

a. Goal Attainment: Please circle the appropriate number to indicate the degree to which the workshop goals have been achieved.

At the end of this workshop trainees will be able to:

1. Identify resources necessary for village spring capping projects.

1	2	3	(2)	4	(16)	5
Low						High

2. Communicate and facilitate village leadership activities necessary for project implementation.

1	2	3	(2)	4	(13)	5
Low						High

3. Identify and apply strategies for involving the community in spring capping activities.

1	2	3	(6)	4	(12)	5
Low						High

4. Survey and evaluate sites for potential spring excavation.

1	2	(1)	3	(6)	4	(11)	5
Low							High

5. Communicate and apply relevant theories about water and its relationship to the environment.

1	2	(1)	3	(7)	4	(10)	5
Low							High

6. Develop and implement work plans and logistics necessary for project start-up.

1	2	(2)	3	(3)	4	(13)	5
Low							High

7. Coordinate and supervise work force and delivery of materials.

1	2	(2)	3	(2)	4	(14)	5
Low							High

8. Design and build a retaining wall for capping springs.

1	2	(2)	3	(8)	4	(8)	5
Low							High

- o Operate, maintain, troubleshoot and repair capped springs.

1 _____ 2 (2) 3 (7) 4 (9) 5 _____
Low High

- o Describe how to design and build two alternative spring capping systems, spring box and infiltration systems.

1 _____ 2 _____ 3 (11) 4 (7) 5 _____
Low High

- o Identify strategies for solving most common problems which occur throughout spring capping process.

1 _____ 2 (1) 3 (7) 4 (10) 5 _____
Low High

- o Evaluate spring capping project, document and record information gathered for future use.

1 _____ 2 (1) 3 (7) 4 (10) 5 _____
Low High

- o Develop and implement action plans for incorporating these improvements into village life for longer term environmental impacts.

1 _____ 2 (2) 3 (8) 4 (8) 5 _____
Low High

B. Workshop Feedback and Learning: Please answer the following questions as fully as possible so that the trainers can learn how effective the workshop methodology was.

1. What have been the most positive things about this workshop? *Comments:*
 - all classroom sessions; trainer techniques; theory; small group work; organization of the training; active participation of trainees and patience of trainers; good ambiance; clear presentations; handouts; split of theory and practice
2. What have been the most negative things about this workshop? *Comments:*
 - not completing the demo site; inadequate housing; delays in getting needed construction materials; lack of village participation; poor work site organization; poor site selection; inadequate transport; delay in payment of allowances; inequity of per diems
3. What one thing stands out as important to you in this experience? *Comments:*
 - everyone worked with their hands; technical info on spring improvement; mix of theory and practice; good will of trainers and participants; friendship and team spirit; working physically until exhaustion; theoretical training; planning of the theory sessions; lack of community participation; practical and concrete

4. What things have you learned that you did not know before? Comments:
- finding spring flows; everything about a spring capping project; constructing a wall and installing pipes; working with cement and mortar; many things that will help me do my work better; building forms

C. Workshop Organization and Training

1. What comments do you have about the way the workshop was organized or conducted? Participant housing not adequate; poor planning for materials procurement; community not prepared for demo project; poor organization at work site; theory succeeded more than practical work; planning and organization need begin much earlier

2. What can be done in the future to improve a workshop like this? Thorough site survey, design and planning for materials needed for construction; prepare the community to participate better planning, organization and sensitizing of the population; better housing; early involvement of local agents

3. What specific steps in developing a spring capping project do you think you will need to learn more about in order to successfully complete an activity such as a project in the future? How to build a retaining wall; planning and evaluating a project; by reading handbook believe I can do the different steps; practice on another type of spring; inspection of potential springs; technical plan for site; constructing foundation; getting materials

4. What comments do you have about the trainers? - Very interesting; theory trainers did very well but fieldwork was a little defective; patience of trainers and good replies to questions; very nice; without problems pedagogically; full of good will; up to their task; generally excellent

Appendix F

SUMMARY OF ACTIVITIES IN TOGO

January 30, 1983:

Arrival in Lome. Met by USAID Health Education Contractor, Ms. Sarah FRY, and Technical Trainer, Mr. Pierre LEGER. We traveled by road to Atakpame to meet in the evening at Ms. Fry's house with the Regional Social Affairs Director for the Plateaux Region, MME ZOUMARO Ikpindi, the Regional Director for Sanitation, Mr. EDORH A. Seme, the Regional Supervisor for the Project in the Plateaux, Mr. MADJOME Tchanimbe and the two co-trainers selected for the rainwater harvesting workshop, Mr. DAGBEGNON Mawuli who is a social affairs agent in Atakpame responsible for women's programs and project activities, and Mr. DJIDO Hounake who is a sanitary agent responsible for project activities in the area of Anie, 30 miles north of Atakpame. Following introductions, everyone was briefed by the WASH trainers on the goals, schedule and basics of the rainwater harvesting workshop. Subsequently there was informal discussion of the Togo Project - particularly the past training experiences in training of trainers, community participation, education for health and techniques for working with Village Health Committees.

January 31, 1983:

We met at the Regional Social Affairs Office in Atakpame with Mme. ZOUMARO and Mr. MADJOME to review questions sent by David Goff regarding planning for the spring capping workshop. After a seven hour drive to Dapaong with Ms. Fry, Mr. Leger and the two co-trainers, we met with the National Coordinator for the Project, Mr. OURO-BAWINAY Tachatomby and the Regional Director for the Savnes, Mr. AGBA T. Akoloum.

February 1, 1983:

A planning and orientation meeting was held at the Regional Social Affairs Office in Dapaong with everyone from previous evening plus the Savanes Regional Director for Sanitation, Mr. ISSAKA Moustapha and the Sector Chief for the Prefecture of Oti, Mr. MAMA Abdoulaye. Later began the orientation and review of the training guide with the co-trainers which included a definition of roles.

February 2, 1983:

We traveled to Mango, the capital of the Prefecture of Oti, for a logistics planning session at the Social Affairs Office. In the afternoon we held a briefing meeting with the village health

committee of BARKOISSI, a large village thirty minutes drive from Mango that had been selected for the demonstration of a rainwater harvesting system.

The Committee proposed three possible sites in the village for the demonstration system: the health clinic, primary school and the junior high school. Mr. Pierre Leger selected the latter as the site since there were no wells or other clean water sources nearby. The village chief closed the meeting by thanking everyone for coming to assist the village and assuring everyone of the village's cooperation and participation. We returned to Dapaong for an evening review and planning session.

February 3, 1983:

The technical training team, Mr. Leger and Mr. Djido, returned to BARKOISSI for technical survey of the site while Ms. Fry begun translating the training guide, and the methodology training team, Mr. Jennings and Mr. Dagbegnon, began reviewing the first session.

February 4, 1983:

The technical training team went to BARKOISSI to explain the construction plan for the reservoir to the two project masons and the iron worker plus the director of the Junior high school who is also the president of the village health committee. The methodology training team and Ms. Fry continued planning in Dapaong for the sessions of the first week.

February 5, 1983:

The technical training team concentrated on getting a work force lined up to begin excavating the site for the reservoir while methodology team reviewed plans for the first week with the sector chief and the social affairs agent in BARKOISSI, Mr. Paidra Tissoga, so that they could make arrangements for all planned activities in the village. (Note: this should have been done three days earlier to enable them to properly explain and assure all necessary arrangements.

February 6, 1983:

We moved to the government compement in Mango to make all final logistic and training preparations; In the evening: informal get acquainted welcome dinner with the twenty participants.

February 7 - 18, 1983:

Rainwater harvesting training in Mango and Barkoissi.

February 19, 1983:

10 hour drive from Mango to Lome.

February 20, 1983:

Lome Airport at 4:30 a.m. to meet technical trainer for spring capping workshop, Mr. David Goff, who did not arrive.

February 21, 1983:

Review of evaluations from the rainwater harvesting workshop with Ms. Fry and Mr. Leger and a discussion of his recommendations for future training and training guide revisions.

February 22 1983:

David Goff arrived at 6:00 a.m. We had an afternoon planning session with the National Coordinator, Mr. Goff and Ms. Fry at the Office of the National Coordinator.

February 23, 1983:

We held a planning session at National Coordinator's office with all from previous afternoon plus the USAID/TOGO Program Officer, Mr. Paul Guild. We traveled to Atakpame with Ms. Fry, Mr. Goff and the project bilingual secretary, Mr. Koula Amissa. An introductory orientation planning meeting was had at the regional office with the Regional Director, a Peace Corps volunteer assigned to the Project, Ms. Barabara Weis, and the two co-trainers for the spring capping workshop, Mr. Madjome Tchanimbe and Mr. Edorh A. Seme.

February 24 and 25, 1983:

The technical training Team, Mr. Goff and Mr. Edorh, traveled to Badou to inspect potential demonstration sites and then make preliminary construction plans for the site chosen at TOTAME, a small non-Project village twenty minutes drive from Badou. The methodology training team, Mr. Jennings and Mr. Madjome reviewed training sessions and plans with Ms. Weis and one of the rainwater harvesting co-trainers, Mr. Dagbegnon.

February 26, 1983:

The trainers, project secretary and Ms. Fry traveled from Atakpame to Badou and began preparing training materials and classroom in the restaurant of the Hotel ABUTA. We also briefed sector chief, Mr. Tsogbale Mawouna, on plans and needed assistance.

February 27, 1983:

Two project masons, the iron worker and materials arrived in Badou followed by the twenty participants. A welcome dinner and informal evening of introductions were held.

February 28 - March 1, 1983:

First two days of the Spring Capping Workshop.

March 2 - 4, 1983:

The workshop was suspended for three days because of an unexpected Presidential visit to Badou and the need for agents to return to their posts to collect their salaries. The trainers used the time well to prepare materials and review sessions together in Atakpame, as well as to revise training plan to fit into the remaining days.

March 5 -12, 1983:

Spring Capping Workshop at Badou and Totame.

March 13, 1983:

Travel from Badou to Atakpame after organizing all materials and clearing training site.

March 14-16, 1983:

Work at Atakpame with co-trainers from both workshops on preparing revised french training guides and materials.

March 17-26, 1983:

Travel to Lome with four co-trainers to complete work at USAID/TOGO on the revised training manuals with the project bilingual secretary. We had de-briefing conferences with Dr. Raymond Isely of WASH and meeting with Directors of Peace Corps and CUSO Operations in Togo regarding possible future use of the training guides by the experienced Togolese co-trainers. Final de-briefings were also had with USAID/TOGO personnel.

March 18, 1983:

Departure from Lome.

PROGRAMME DE DEVELOPPEMENT
SOCIO-SANITAIRE

Projet USAID No. 693 - 0210

Rapport Technique sur le
Séminaire sur la Récolte des Eaux
Eaux Pluviales Tenu à MANGO
du 7 au 18 Février 1983

Fait à Lomé, le 22 Février 1983

PIERRE R. LEGER
Ingénieur Sanitaire
W.A.S.H.

INTRODUCTION

Pendant la période du 7 au 18 Février 1983, un séminaire sur la Récolte des Eaux Pluviales a été organisé par le Programme de Développement Socio-Sanitaire du Togo, financé par l'U.S.A.I.D. et l'assistance technique de W.A.S.H. à Mango dans la Préfecture de l'Oti.

Le but principal de ce séminaire était de vérifier l'application d'un programme spécifique de formation dans le domaine en question développé par W.A.S.H. et de l'adapter à la réalité et aux besoins du Projet USAID/FAC/FED d'Hydraulique Villageoise.

A cet effet, le séminaire a été présenté à un groupe de 10 agents socio-Sanitaires (Agents des Affaires Sociales et de l'Assainissement) provenant des régions du Projet où les possibilités d'approvisionnement en eau par forage s'étaient avérées négatives.

L'approche adoptée pour la présentation du séminaire était d'utiliser une équipe d'experts de W.A.S.H. composée d'un Formateur et d'un Ingénieur Sanitaire, en collaboration avec deux Co-Formateurs Togolais (un Agent des Affaires Sociales et un Agent de l'Assainissement) qui, après avoir assisté à ce séminaire pourraient eux-mêmes renouveler cette formation à l'avenir. Les deux co-formateurs ayant une expertise dans le domaine de la pédagogie, ont été utilisés comme suit:

- L'Agent des Affaires Sociales comme Homologue du Formateur de W.A.S.H.,
- et l'Agent d'Assainissement comme Homologue de l'Ingénieur Sanitaire de W.A.S.H.

Durant les onze jours du séminaire, un programme de travail composé d'exposés, d'enquêtes techniques, économiques et socio-sanitaires, des travaux pratiques et de construction d'un système de récolte d'eaux pluvieuses a été présenté et ceci selon les grandes lignes tracées par le programme de formation qui a été conçu par W.A.S.H. Cependant, la situation réelle au Togo, situation qui a un peu dévié des hypothèses faites pendant la conception du programme par W.A.S.H., plusieurs séances ont été modifiées par l'Equipe des Formateurs afin de répondre à la situation et aux besoins réels du Projet.

L'objet de ce rapport est de prendre en considération les changements techniques faits au programme initial développé par W.A.S.H., et de recommander des modifications techniques à porter à obtenir un programme approprié pour le Programme Socio-Sanitaire du Projet d'Hydraulique Villageoise; aussi la méthodologie de présentation du séminaire par les Formateurs locaux qui ont assisté à ce premier séminaire. En dernier lieu, des recommandations générales pour l'amélioration du système dans le cadre du Projet sont faites. Aussi, est donnée en annexe, une fiche descriptive de réalisation du système à BARKOISSI.

Recommandations pour l'Adaptation du Programme de Formation
sur la Récolte des Eaux Pluviales dans le Cadre du Projet
d'Hydraulique Villageoise

A. - Approche pour la présentation de futurs séminaires

L'approche recommandée pour la présentation de futurs séminaires sur la Récolte des Eaux Pluviales est la suivante:

(1) Formateurs

L'équipe des formateurs pourrait inclure un Agent des Affaires Sociales et un Agent d'Assainissement ayant l'expertise requise pour la formation d'adultes. L'Agent des Affaires Sociales servirait principalement comme ressource dans les séances ayant trait à la sociologie, et celui d'Assainissement servirait comme ressource pour la partie technique du Programme.

(2) Support Technique aux Formateurs

L'équipe des formateurs pourrait essayer d'identifier et de recruter la participation de certains techniciens qui seraient disponibles sur place pour présenter certaines séances du séminaire; par exemple, les techniciens de la Météorologie, les techniciens des Travaux Publics, etc... Ceci permettrait à renforcer les capacités de l'équipe d'une part, et à faire participer au maximum, les expertises disponibles localement d'autre part.

(3) Support dans la Construction

La réalisation du système de Récolte des Eaux Pluviales nécessitera l'intervention d'ouvriers qualifiés (maçons, ferrailleurs, menuisiers, plombiers, et/ou forgerons) qui, d'une part, seraient appelés à exécuter les travaux nécessaires (construction de la citerne et des gouttières) et à enseigner aux ouvriers qualifiés du village de démonstration, les techniques de construction, d'autre part. Les ouvriers qualifiés peuvent être recrutés, soit à partir des ressources disponibles localement, c.à.d. les sections techniques des Travaux Publics. Cependant, il sera nécessaire que les ouvriers qualifiés utilisés soient bien informés sur les buts, objectifs et plan d'exécution du programme de formation pour pouvoir exécuter efficacement les rôles qui leur seront confiés.

B. - Le Programme de Formation

Le Programme de Formation développé par W.A.S.H. et présenté en 17 séances s'est avéré approprié pour atteindre les buts et objectifs fixés. Cependant les modifications suivantes du contenu des séances sont recommandées:

1) Séance 1: INTRODUCTION

Cette séance devra inclure une introduction particulière à la technique de Récolte d'Eaux Pluviales comme système d'approvisionnement en eau potable villageois. Cette introduction devra mentionner les faits suivants:

- a) Le rôle de cette technologie dans le cadre du Projet d'Hydraulique Villageoise au Togo.
- b) Les avantages et désavantages de cette technologie par rapport à d'autres technologies d'approvisionnement en eau potable (quantité, qualité, accès).

2) Séance 2: Développement d'un Projet de Récolte d'Eaux Pluviales

Cette séance devrait commencer par l'introduction du modèle sur lequel s'est basé le développement du Programme de Formation. Ce modèle consiste des trois paramètres-clé pour le développement d'un projet approprié: la faisabilité technique du projet, l'acceptabilité sociale du projet, et enfin la faisabilité économique du projet. Ces trois paramètres résultant à des options qui seraient de discuter avec les villageois afin d'arriver à une décision de la part de ces derniers pour le choix de technologie à utiliser dans un projet quelconque.

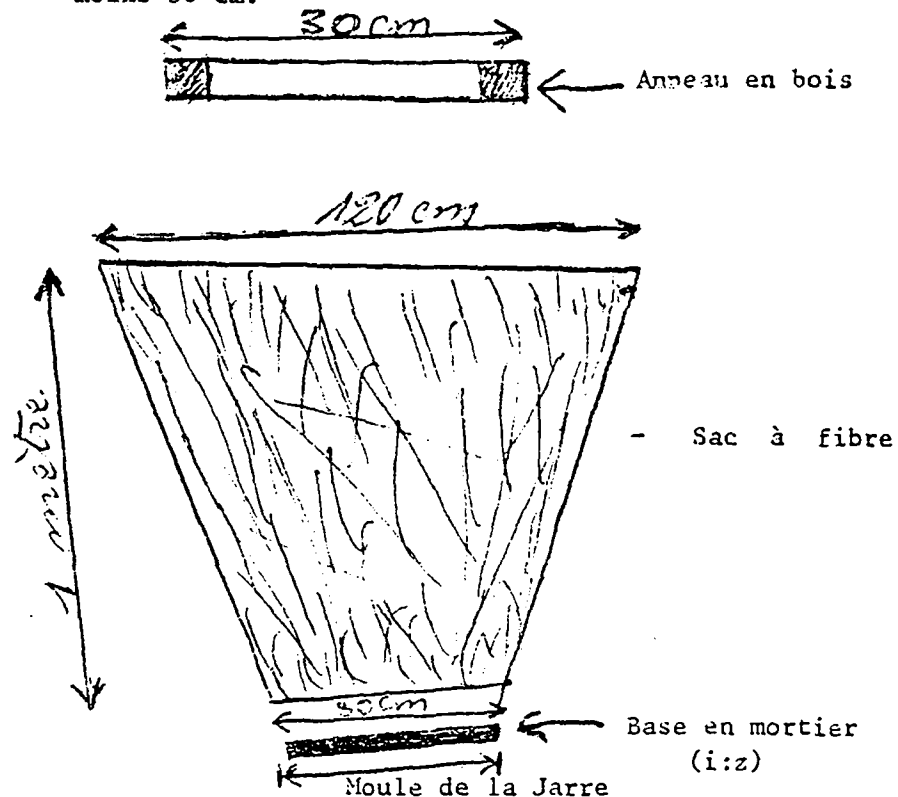
3) Séance 3: Evaluation Technique Initiale

Une visite à une station météorologique comportant un pluviomètre devrait être faite. Durant cette visite, il serait souhaitable qu'un exposé sur le fonctionnement du pluviomètre, la collecte et l'exploitation des données pluviométriques soit fait par un technicien qualifié de la station. Ceci permettrait une meilleure compréhension des informations concernant la pluviométrie chez les participants comme a été le cas durant ce dernier séminaire à Mango.

4) Séance 6: Démonstration de la Construction d'un Récipient de Stockage à Base de Mortier

Cette séance devrait présenter la technologie pour réaliser la jarre:

- a) Construction d'une base en mortier (sable et ciment en rapport de 1 volume de ciment pour 2 volumes de sable) de 60 cm de diamètre et de 1,5 cm d'épaisseur, dans le sol (creusement d'un moule comportant ces dimensions dans le sol).
- b) Préparation d'un moule à base d'un moule à sac de fibre ayant les dimensions suivantes: une base circulaire ayant un diamètre de 80 cm cousue à un cylindre ayant 80 cm à la base et 120 cm au sommet, et ce dernier étant au moins d'un mètre de haut serait cousu à un moule annulaire en bois ayant une ouverture d'au moins 30 cm.



- c) Remplissage du moule avec du sable.
- d) Application d'une couche d'un centimètre de mortier (1 volume de ciment pour 3 Volume de sable), suivi d'une couche secondaire de 0,5 cm sur le moule imbibé d'eau.

- e) Construction de l'ouverture de la jarre.

f) Attente de 24 heures pour permettre à la jarre de durcir; puis il serait préférable de demander à chaque groupe de participants (groupes de 2 à 3 personnes) de concevoir leurs propres moules afin de les essayer sur le terrain. Chaque groupe devrait inclure un maçon de village et devait être supervisé par un maçon expérimenté.

Aussi cette séance devrait contenir une visite à un fabricant local de jarre à base d'argile. Ce qui permettrait de comparer cette nouvelle technologie à la technologie traditionnelle.

5) Séance 10: Planification, Organisation, Gestion et Réalisation de la Construction

Cette séance devrait définir le rôle de la planification, de l'organisation et de la gestion des activités de construction, aussi bien de développer la méthodologie pour planifier, organiser, et gérer ces activités.

Pour la planification des activités, une matrice montrant la durée, les ressources et les coûts estimés pour chaque activité devrait être préparée.

Enfin un plan d'exécution montrant les étapes à suivre pour la mise en exécution d'un projet de récolte d'eaux pluviales devrait être préparé.

6) Séance 12: Développement d'un Plan pour la Surveillance et la Maintenance du Système

Un exposé sur le contrôle et la surveillance d'un système de Récolte d'Eaux Pluviales suivi d'une discussion du sujet devrait être fait. A la fin de la discussion, un plan de contrôle, de surveillance et de maintenance devrait être développé. Le plan devrait inclure les éléments à inspecter dans le système, les responsables pour le contrôle, la surveillance, et les travaux d'entretien, le matériel nécessaire, et l'organisation des activités de maintenance.

Un exposé spécial concernant la désinfection des ouvrages et des eaux de citernes devrait être fait. Ce dernier devrait être suivi par des travaux pratiques sur le terrain (désinfection des eaux d'un puits ou d'une citerne existante) aussi bien que la désinfection de la citerne de démonstration une fois construite.

7) Séance 13: Construction de la Citerne

Cette séance devrait commencer au moins 4 jours avant le début du séminaire. Un dossier complet des activités entreprises durant toute la période de construction devrait être maintenu. Ce dossier devrait contenir la durée exacte, les ressources humaines et matérielles utilisées, et les observations pertinentes concernant l'exécution des travaux pour chacune des activités de la construction. Ceci servira pour l'évaluation du projet (planification, organisation, gestion et exécution).

8) Séance 14: Critique et Raffinement du Système

Cette séance devrait aussi inclure une évaluation technique, sociale, et économique du système réalisé. Cette évaluation devrait se faire par une analyse spécifique des facteurs de facilités et de contraintes qui ont été observés pour chacun des trois composants (Technique, Sociale, Économique) du projet. Puis des solutions appropriées devraient être proposées afin d'améliorer la technologie dans sa conception, son acceptation, et son coût.

C. - Utilisation des Séminaires sur la Récolte des Eaux Pluviales pour l'Identification et la Standardisation des Méthodes et Moyens de Conception et de Réalisation des Systèmes

Ce dernier séminaire a pu démontrer la conception et la réalisation d'un système de Récolte d'Eaux Pluviales composé d'un toit et des gouttières en tôle, et une citerne en béton armé. Il est recommandé qu'à chaque présentation future du séminaire, d'autres types de matériaux soient utilisés en particulier pour les citernes (briques creuses avec armature, murs en moellon, mortier armé, armature en grillage de cage, etc.). Ceci permettrait au projet d'obtenir les informations nécessaires sur la construction des citernes utilisant différents types de matériaux afin d'adopter des types standard de citernes à réaliser suivant les régions. Pour arriver à ceci, il serait nécessaire qu'à chaque séminaire, le coût de la réalisation du système soit enregistré ainsi que les difficultés ou facilités rencontrées durant la réalisation du système.

D'autre part, il serait souhaitable que le Projet d'Hydraulique Villageoise développe des projets-"types" avec plans standard afin de minimiser les décisions techniques que devront prendre les agents socio-sanitaires qui seront responsables pour la conception et la réalisation des systèmes de Récolte d'Eaux Pluviales sur le terrain.

A N N E X E

FICHE DESCRIPTIVE SUR LE SYSTEME DE
RECOLTE D'EAUX PLUVIALES A BARKOISSI

A. - Informations Générales

Village d'Emplacement : BARKOISSI
Site d'Emplacement : C.E.G.
Nombre de personnes à servir: 230 élèves

B. - Surface de Collecte

Surface: Toit de l'immeuble du C.E.G.
Type de matériaux: Tôle
Dimension totale de la surface: 44mx10m = 440m²
Surface utilisée : 44mx 5m = 220m²
Etat de la Surface de Collecte: Bonne

C. - Gouttières

Longueur de la ligne: 44m
Type de matériaux: Tôle
Type de jointes : Soudure
Matériaux du tuyau de descente: Tôle
Système de grand lavage: Manuel
Support pour les gouttières: Fer de 10(60 cm de long)
Durée de la Construction: 5 jours
Coût estimatif du système de gouttières(transport et main-
d'oeuvre exclus) : 8.000 F CFA

D. - Citerne

Capacité totale: 19,2m³
Volume d'eau : 17,5m³
Dimensions intérieures: 3m50 de longx 2m50 de largex2m10 de haut
Matériaux de Construction: Béton Armé
Type de Réservoir: Semi-enterré
Durée de la Construction: 13 jours
Coût Estimatif de la Citerne(transport et main d'oeuvre exclus)=110.000 CFA

APPENDIX H

TECHNICAL ANNEX

SPRING CAP TRAINING COURSE

This technical annex describes the sequence of activities followed to plan and implement the technical portions of the training course for spring capping held in BADOU, TOGO, 7 February-12 March, 1983. Problems and recommendations(*) from this field test are discussed and grouped under each activity.

Advance Preparations By Cable

1. Review scope of work
2. Specifications for spring cap project site selection.
 - A cable was sent(see attached copy) and reference materials were forwarded to the TOGO AID mission to describe the desired site(s) for the spring cap training project and course.
 - * When possible, the selection of the location for the training course should be more heavily based on the availability and proximity of an unimproved spring, representative of the participants' future projects, which can be easily capped.
 - * Direct correspondance with the proposed technical co-trainer and sending of photos will help to insure selection of appropriate training project sites.
3. Requisition for estimated types and quantities of construction materials and tools.
 - See the attached cable which included a sample list; almost too comprehensive, of the materials and tools one might require for capping most any moderate-sized spring.
 - * The advanced knowledge of the typical materials used locally/regionally for capping springs or field construction will be valuable for planning.
4. Translation of training sessions and handouts.
 - * The co-trainers will benefit greatly if they can conduct advance review of the technical training sessions and the spring cap construction method recommended for the training project.

(2)

In-Country - Prior to Training
BADOU - One day visit

5. Proposed spring site survey

- Final selection of the training project spring site was made only a few days in advance of the training course during a one day visit with the technical co-trainer, M. Eдорh, and the Badou project representative, M. Tsjogbale, and the WASH technical trainer.
- The TOTAME spring, which was not a project village and eight kilometers from the classrooms in Badou had already been selected over an unimproved spring in a project village, Badou-Djili, three kilometers from Badou. A well is planned for Badou-Djili; whereas, the Totame village and market had no improved water supply.
- * The technical co-trainers should have several days together in advance of the training to insure appropriate spring project site selection. If there has been no opportunity for the national technical co-trainer to review the technical sessions in advance, at least ten days should be spent together before training begins.

6. Technical design and resource requirements for the spring cap training project.

- The spring is located on a steep slope; prior to construction, in a large, eroding, roof-filled cavern. During the dry season, several small trickles provide a minimally acceptable springflow of 7-10 liters per minute. The site was designed to be capped with a retaining wall, substantial fortification of the cavern, and multiple pipes for the seasonally variable springflow. A paved road permitted access for delivery of materials. See the attached drawing of the site and design.
- * Spring sites such as Totame should normally not be chosen because of the labor and material requirements, 15 cubic meters for backfilling. Also the flow should not be seasonally variable. Spring cap training projects should be selected to cap springflows which are constant and of moderate size, 15-50 liters per minute, requiring moderate total quantities of materials, 5-8 cubic meters.

7. Community Sensibilization and participation

- Meeting with M. Eдорh, WASH technical trainer, the chief and villagers, to discuss needs and benefits for spring improvement and their participation.
- Although this was the first meeting with the chief and villagers, agreements were made to gather stones, provide labor, store tools and guard the site.

7. (continued)

- * The community must be involved throughout the planning or the people will not accept responsibility or ownership. Their daily work schedules must be respected, especially during harvest. Spring construction must be understood and scheduled in advance.

In-Country Prior to Training

ATAKPAME - three days

8. Review and supplemental requisition of construction materials and tools with M. Eдорh.
 - Only stones were close enough for the villagers to gather and transport. Sand, clay and gravel had to be estimated, loaded and transported by project trucks. Water supply at the spring site was also limited.
 - * Advance planning for materials and tools should normally only include cement, piping; availability of stone, gravel, clay and sand. Consultation regarding tools with the skilled labor force.
9. Preparation and review of technical sessions for national co-trainer participation in training course.
 - Classtime for the various technical sessions and fieldwork supervision were divided between the technical trainers. Handouts, flipcharts and drawings were prepared. The previously translated training materials were reviewed, the french corrected and the remainder translated and reviewed.
 - * The importance of completely translating training materials in advance cannot be underemphasized. Field testing and training with national co-trainers can provide significant feedback on process and content and a permanent national resource for continuing technical training activities.
10. Discussions of spring cap design and construction with the skilled labor force: 2 masons and 1 ironworker.
 - The technical trainers met with the skilled labor force for one hour to review the basic elements of capping a spring, the concrete foundation, reinforcement, and the rock and mortar retaining wall. They related their experience in building and tank construction. Tools and materials were reviewed.
 - This team was pressed into working long hours in unfamiliar conditions, under stress to complete a formidable task without the support of unskilled laborers. Without guards from the village, they spent two nights at the spring site to insure that the villagers did not tamper with the newly constructed walls and pipes. Their efforts were admirable.

10. (continued)

- * Much more time should be available for at least the national technical cotrainers to become familiar with the skilled workforce, inspect some of their work, evaluate their ability to work unsupervised and follow technical directions. This will provide more freedom for the trainers to train and less emphasis on completing the spring project and supervising construction.

BADOU: Training Course Begins

11. Survey of various springs and inspection of Totame spring training site.

- The participants visited two other types of spring sites, a seep and a flat, waterhole, to discuss the geological and different design issues. There was no example of an improved or capped spring in the area.
- At Totame, no stones had been gathered or transported as promised. In fact, the villagers now wanted to be paid for their labor, because they learned that the trainees were salaried.
- Arrangements were made to transport stones by project trucks. The prefect sent a letter asking the chief to mobilize his people to gather stones and work with the project to improve their water supply; without succeeding.
- Unlimited quantities of excellent clay were located in a nearby potters' village, but the price was prohibitive; almost the price of cement.

- * A project village, previously motivated, with a history of participation and a village (health) committee should be selected. Previous to the training, agreements should be signed, some materials be amassed on-site and some labor performed; e.g. the rainwater/runoff diversion ditch. This is another reason for site selection to be established well in advance through adequate correspondence and photos by national technicians. Most rural people are conservative and do not readily accept surprises or sudden decisions made by others. Especially when strangers come to explain that they're going to interrupt their operating water supply to improve the service. However, due to construction problems and no assistance with labor, the training ends before service is restored and a delay follows before repairs can be completed.

12. Logistics for construction supervision, materials delivery, technical training and participation by trainees throughout the spring cap training project.

- The distance from the classroom to the Totame site required at least one hour's time loss for each visit by the participants; totalling one-half day training lost during the course.

12. (continued)

- In order to achieve each day's scheduled construction progress without community assistance, the participants were often forced to labor.
- * A standby labor force of 5 persons should be organized in case of emergencies regarding community participation; e.g. a funeral.
- * The advantages of the classroom with an adjacent spring training project site are many.

13. Technical Sessions

During the first three days, Introduction to spring capping, the sanitary surveys and the planning and design sessions went smoothly with adequate training time scheduled for the trainees to cover the theory in class and develop these skills through the field work.

- A three day delay followed due to the Togolese President's visit to Badou and stay at our hotel, during which time all trainers and participants were obliged to leave.
- When it became evident that the villagers weren't going to help, it was necessary for the technical trainers to spend more time working at the site.
- The remaining technical sessions were redesigned to be conducted on-site with one technical trainer available at day's end to review the field activities in the classroom. In this manner, the participants were regularly conscripted to assist with labor and the spring construction.

14. Spring Cap Construction - see attached drawing of the spring.

- It would have been difficult to plan the demonstration of such varied and possible construction problems for training the participants as did occur around the capping of the spring. A second leak developed just before disinfection and completion which required several cubic meters of stone fill to be removed. This became a two day repair job, which, unfortunately became the responsibility of M. Edorh and could not be completed by the Atakpame crew for at least two weeks. The WASH consultant was committed to a Zaire contract immediately following the Togo training, however an offer was made to return personally if there were problems.
- The following paragraphs describe some of the problems encountered during construction.
 - a. The spring was barely flowing from four points in the cavity. A long section of PVC pipe was connected to the small clay dam, constructed to contain these springflows for dry season water supply provision. As the water level slowly increased, one of the tiny springflows found an easier way underground and around the wall to flow downhill. Concrete and mortar were used to temporarily repair this leak.

14. (continued)

- b. The steeply-sloped, eroded spring cavity kept falling in. All loose earth had to be knocked down and removed. Then, the cavity walls were fortified with concrete and the entire space was eventually filled with large stone and materials to make it permanently, structurally sound. This required a tripling of the estimated fill materials and further problems with delivery and labor.
- c. Aside from the lack of village participation, the construction of the rock and mortar retaining wall is worth mentioning. The masons were well-experienced with building walls; however, not those which would constantly be resisting the flow of water. Therefore, the required concrete and mortar mixes and the wetting of stones for better binding were issues of difference which had to be constantly supervised.

Final Remarks

The WASH consultants were very fortunate to have had the full support of the Togolese project and USAID mission staff. The technical cotrainer, M. Edorn, is the regional director of sanitation programs, a highly capable trainer and technically savvy. His talents will be ideal for future technical training activities in Togo and elsewhere. His contributions to the technical sessions and construction activities were indispensable.

It is the opinion of the writer that if the spring had been completed successfully before the trainees departed, then all of the problems and resolutions would have only benefited their experience and increased their confidence. However, as it turned out, it is certain that many of the participants will need technical assistance and supervision when they select and design a spring to cap. The course is designed to train the participants in one construction method for capping springs; the sloped spring and retaining wall. This is the most common and representative type of spring found. In order to demonstrate another method during the course, either additional sessions must be added, or some of the softer development training reduced; e.g. participants have been previously trained in community development or health education.

Final Remarks(continued)

A method should be developed for more effective testing by the participants of their progress with skills and comprehension. The supply of construction materials and technical supervision for the initiation of their own projects just after training and their familiarity with their own spring problems prior to training will encourage implementation of spring improvements.

Qualified national technicians from other ministries should be involved in water training activities, in order to stimulate their interest and collaboration re: rural water needs and improvements; where there is an obvious need for gravity distribution systems which is beyond project capability but within other ministries.

The total cost for materials and delivery was approximately 200,000 CFA. The number of villagers to benefit from the improvement was estimated at 500. Therefore the cost per capita is 400CFA or about \$2, not including labor.

