

WATER AND SANITATION  
FOR HEALTH PROJECT



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# IN-SERVICE TECHNICAL TRAINING AND PROGRAM REVIEW OF PEACE CORPS VOLUNTEERS IN RURAL WATER SUPPLY SYSTEMS IN MOROCCO

WASH FIELD REPORT NO. 61

NOVEMBER 1982

Prepared For:  
USAID Mission to the Kingdom of Morocco  
Order of Technical Direction No. 111

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November 10, 1982

Mr. Harold Fleming  
Mission Director  
USAID  
Rabat, Morocco

Attn: Mr. Jerry Bowers

Dear Mr. Fleming:

On behalf of the WASH Project, I am pleased to provide you with five (5) copies of a report on The Peace Corps Potable Water Project.

This is the final report by Keith Sherer and is based on his trip to Morocco from September 11 to October 6, 1982.

This assistance is the result of a request by the Mission on August 24, 1982. The work was undertaken by the WASH Project on September 1, 1982, by means of Order of Technical Direction No. 111, 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.  
WASH Project Director

Enclosures

cc: Mr. Victor Wehman, Jr.  
S&T/H/WS

DEW/FR/cei

The WASH Project is managed by Camp Dresser & McKee, Incorporated. Principal cooperating institutions and subcontractors are International Science and Technology Institute, Research Triangle Institute, University of North Carolina at Chapel Hill, Georgia Institute of Technology—Engineering Experiment Station.

WASH FIELD REPORT NO. 61

MOROCCO

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REVIEW OF PEACE CORPS VOLUNTEERS  
IN RURAL WATER SUPPLY SYSTEMS IN MOROCCO

Prepared for the USAID Mission to the Kingdom of Morocco  
under Order of Technical Direction No. 111

Prepared by:

Keith Sherer

November 1982

Water and Sanitation for Health Project  
Contract No. AID/DSPE-C-0080, Project No. 931-1176  
Is sponsored by the Office of Health, Bureau for Science and Technology  
U.S. Agency for International Development  
Washington, DC 20523

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## EXECUTIVE SUMMARY

Peace Corps Morocco requested assistance from AID for a consultant (1) to provide technical in-service training assistance and (2) to review the present state of the potable water program, and make recommendation for the future program.

A consultant was provided through the WASH Project to assist in designing and implementing an in-service course in Lister diesel engine repair and vertical axis turbine pump repair and installation. This training was conducted under field conditions at a douar site with resultant "real life" problems. The training objectives were met with an in-depth understanding of SR1 series Lister diesel repair and Alta Pump repair by the participating Peace Corps Volunteers (PCVs).

In conducting the program review, seven of nine provinces were visited, and meetings were held with officials in six provinces, with 11 PCVs, as well as with Embassy and UNICEF officials. The program review indicated that improvements in communications between Peace Corps Rabat and the Moroccan Government, as well as PCVs and provincial officials, were needed. Additional coordination between UNICEF, Peace Corps, and the Moroccan Government is indicated.

Even without these program enhancements, the program is providing much needed services and is maturing as a project.

## ACKNOWLEDGEMENTS

Peace Corps Rabat was extremely helpful in conducting this assignment. Special recognition should go to the Training Program Director, Stephaine Sweet, who must have felt Beni Mellal was her home, and to Ahmed Morabet, the Potable Water Program Director, who must have wondered if he had a home.

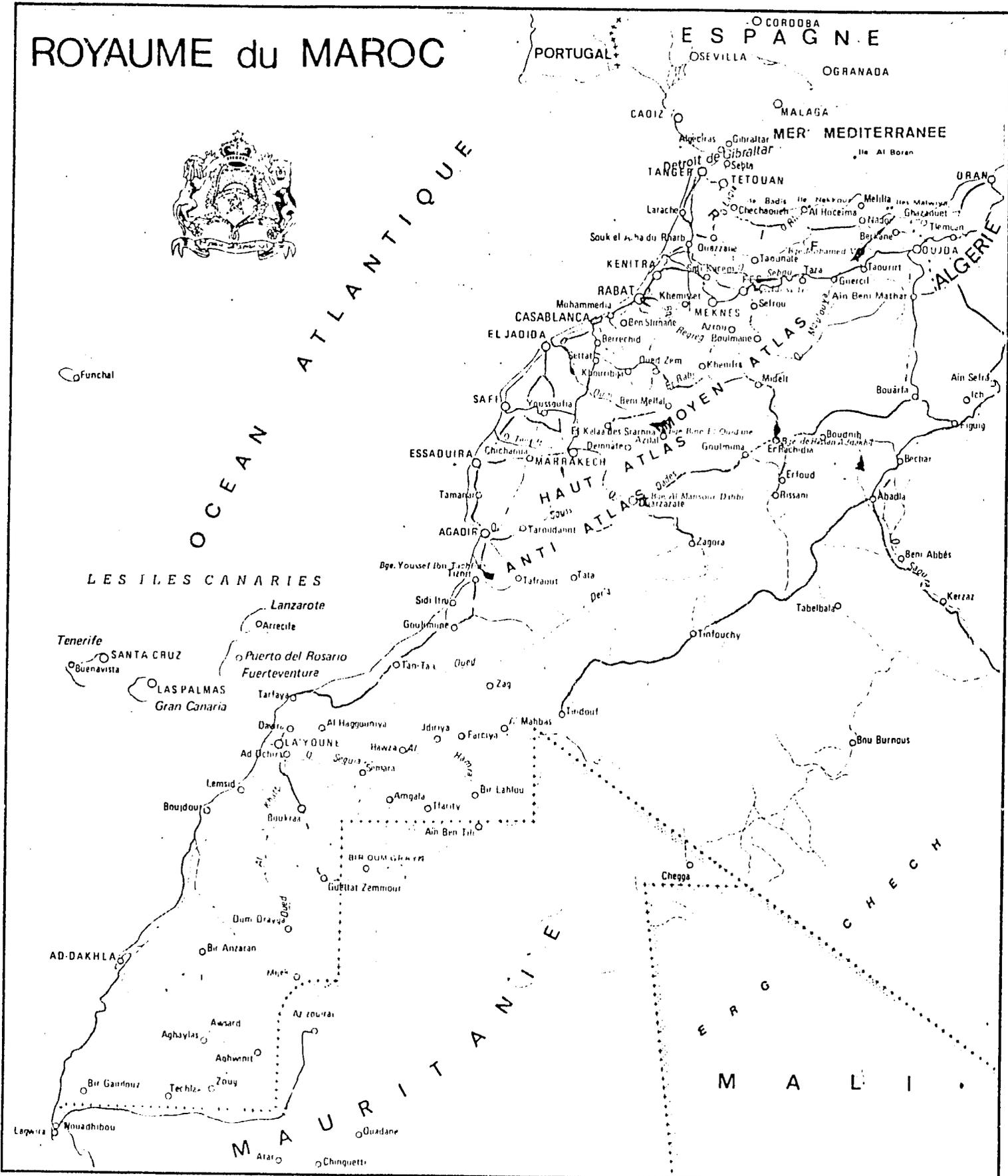
Although the Ministry of the Interior was notified of our schedule of visiting the provinces several times, the Secretary-General had not received word and their helpful assistance to an unexpected visitor was appreciated.

Special recognition is made of the willingness of the Indian Health Service to obtain information on special tools on short notice.

AID Mission staff was helpful and supportive and this back-up was appreciated.

Finally, the Peace Corps Morocco Country Director was very supportive, and this enhanced the project's success.

# ROYAUME du MAROC



Division de la Cartographie - Rabat - 1979

100 200 300 400 km

IMPRIMERIE GAILLARD MAROC

## Chapter 1

### INTRODUCTION

A joint Morocco, UNICEF, and Peace Corps potable water project is underway which is to provide or improve water supplies in over 400 rural villages (douars). Operation and maintenance of these systems is a major component of the project.

The Peace Corps is providing trained specialists to assist the Provinces in construction of the projects and/or establishing operation and maintenance organizations.

The Peace Corps provided 20 Peace Corps volunteers (PCVs) to nine provinces following a period of technical and language training which lasted 16 weeks and ended in February 1982. After seven months of working in the provinces, the Peace Corps requested AID to provide technical assistance for in-service training and to review progress to date as well as recommend future program direction.

AID approved the Peace Corps request for technical assistance and authorized the Water and Sanitation for Health (WASH) Project to provide a consultant under Order of Technical Direction No. 111 dated August 24, 1982 (Appendix A). Based on this, a scope of work was developed (Appendix D) and a technical consultant selected.

The consultant provided technical in-service training for 10 Peace Corps volunteers who have been assigned to work at the provincial level in a potable water program. He also reviewed the progress of the program and provided recommendations concerning future emphasis.

## Chapter 2

### BACKGROUND

#### 2.1 UNICEF Project

UNICEF entered into an agreement with the Moroccan Government wherein about 440 potable water projects were to be funded in rural sectors of 13 provinces. Under the agreement UNICEF was to provide pipe and equipment such as windmills, pumps, and motors. UNICEF would also assist in funding the start-up of an operation and maintenance program. It was planned to begin construction in March 1982 and complete construction by the end of 1983. Due to problems of coordination and material delivery, no projects have been constructed as of October 1982. However, two projects have been initiated in Azilal Province.

The Moroccan Government was to provide indigenous material, skilled and unskilled labor, technical support, and transportation.

#### 2.2 Rural Technology Levels and Past Experience with Water Systems

The projects are located in rural areas of Morocco. Electricity is not normally available and transportation is primarily by animal. Telephones are not available except in large communities.

Many of the douars have had some type of water development project in the past which has failed or is not fully functional because of lack of maintenance and repair. Wells range from a few meters to over 50 meters in depth, and the majority are hand dug. Systems often consist of a windmill, small elevated concrete storage tanks, and a public watering facility. Existing systems which use a diesel motor for power are an exception and are generally found to be operating satisfactorily if a local person or "guardian" is given the responsibility to operate the motor.

#### 2.3 Peace Corps Volunteers

##### 2.3.1 Dimensions of Their Assignment

Peace Corps Volunteers (PCVs) were assigned to the Ministry of the Interior and located in nine provinces where they were to help plan and implement potable water projects and develop operation and maintenance organizations. As an important part of their role, they will eventually be expected to teach water development and maintenance and repair skills to counterparts.

The exact role to be assumed by the individual PCV has depended on the province to which he was assigned. In all cases, PCVs work out of a Government office located in the provincial capital. Daily contacts include governmental officials, technical staff and, on a less frequent basis, officials from UNICEF. The PCVs work with many douars in a Province.

### 2.3.2 Prior Training

Prior to going to Morocco, the PCVs received five weeks of technical training in water and sanitation in the U.S. This was provided by the Indian Health Service (IHS) of the U.S. Public Health Service through an agreement with the Peace Corps.

Following the basic technical training in the United States, additional technical training was provided in Morocco in conjunction with an 11 week language/cross cultural course. This was conducted the first seven weeks by an engineer who had just completed a tour as a PCV in Morocco and the last four weeks by the same WASH consultant who carried out this assignment.

### 2.3.3 PCVs Assignment to the Provinces

After completing their technical, language, and cross cultural training, the volunteers were assigned as teams to nine provinces. The teams consisted of two teams of three and seven teams of two. There were three married couples. One couple was assigned to a team of three. At the time the consultant arrived in Morocco, five of the PCVs had left, four had switched programs and one was in the USA for medical reasons. This included all of the married couples.

#### Peace Corps Volunteers

Location	Volunteers Originally Assigned	Currently Assigned (Includes some transfers)
Azilal	3	1
Beni Mellal	3 (married couple)	1
Ben Slimane	2	1 (medical leave)
El Jadida	2 (married couple)	0
El Kelaa	2 (married couple)	0
Essaouira	2	2
Khouribga	2	2
Safi	2	2
Settat	2	1
UNICEF	0	1 (in process)

## Chapter 3

### TECHNICAL TRAINING AND PROGRAM REVIEW

#### 3.1 Introduction

Two types of technical training were requested by Peace Corps Morocco. The first type was to assist with an in-service diesel repair training course being presented by Lister Diesel and to provide a vertical axis pump training session in conjunction with the diesel repair. The second was for technical training assistance on an individual basis, as needed at the provincial level. This could be specific to a certain spring or douar, clarification on past training, etc. Peace Corps Washington also requested feedback concerning the adequacy/content of past technical training.

The other major component of the Peace Corps Morocco request was for a review of their participation in the potable water program. In essence, they wanted an "outside" view of how the program was going to date and what modifications should be made. This came about in part because of the attrition to date.

#### 3.2 Planning

##### 3.2.1 Preliminary Planning

Prior to leaving for Morocco, the consultant met with Peace Corps Washington and with the Indian Health Service (IHS). The IHS provided the consultant with technical material and information concerning technical requests made to the IHS by PCVs.

Peace Corps Washington discussed training methodologies for in-service training and expressed concern over the high attrition rate. They requested that the consultant comment on the desired background of future PCVs for the potable water project, adequacy of training as viewed by the PCV, qualifications recommended for a Peace Corps staff member in charge of the program, and recommendations as to whether or not the potable water project should be continued.

The consultant spent the first week in Morocco meeting the PCVs who had attended an in-service language course in Tangier, Peace Corps and AID staff and the Charge d'Affaires at the Embassy. The PCVs were questioned about technical training needs in their respective provinces, participation in the diesel engine training session, and the adequacy of past technical training.

Figure 1

TRAVEL ITINERARY FOR TRAINING AND FIELD VISITS

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Sept 12-18	12 Arrive Tangier	13 Meet w/ PCVs Tangier	14 Meet w/ PC staff Rabat	15 Rabat	16 Pick up Training parts Casablanca	17 Visit Training site Beni Mellal Province	18 Return to Rabat
Sept 19-25	19 Pick up Lister Trainer	20 Travel to Beni Mellal	21 Start Diesel Training Azilal Province	22 Visit PCVs El Kelaa Province	23 Conduct pump Training Beni Mellal	24 Assaouira Province	25 Rabat
Sept 26 - Oct 2	26 Close-out w/Lister Trainer Rabat	27 Meet w/ UNICEF Rabat	28 Prepare matr. list Rabat	29 Rabat	30 Khouribga Province	1 Settat Province	2 Safi Province
Oct 3-8	3 Rabat	4 El Jadida & Ben Slimane Provinces	5 Meet w/ Ministry Officials Close-out Rabat	6 Meet w/ Ministry Officials Close-out lv. Rabat	7 lv. Paris	8 Close-out Wash. D.C.	9

Meetings with Peace Corps staff were held to arrange a travel itinerary to the provinces (Appendix C), finalize plans for the diesel and pump in-service training, and to obtain the PCVs assessment of how the program was going.

Meetings with AID and the Charge d'Affaires were held to inform them of the consultant's activities and to obtain their input.

### 3.2.2 Methodology for In-service Training Conducted at Field Site

All training was designed to use experiential learning methods. No formal classroom training was planned. All training was to be accomplished on-site at a douar well-site and at various sites in the provinces. The participants were encouraged to develop their own solutions and were allowed to make mistakes if appropriate.

PCVs were encouraged to bring counterparts with them to the training.

### 3.2.3 Training Objectives

The training objectives were based on the training objectives used during the initial in-country technical training (Appendix F). The exception was that all training was in the field. The in-service training was specifically designed to increase technical skills in the repair and installation of Lister diesel motors and vertical axis turbine pumps and was based on the following objectives:

#### Recognize Problems

1. Determine if operation and preventive maintenance are adequate;
2. Determine if the pump and controls are operating correctly;
3. Determine if the motor is functioning properly as designed.

#### Develop Solutions

1. Prepare a pump parts list, identify resources needed and where they can be obtained;
2. Identify the cause of malfunction, prepare a diesel parts list, and identify resources needed and where they can be obtained.

## Implement

1. Install pumps, motors and controls, and make necessary adjustments;
2. Repair diesel motors.

### 3.3 Implementation

#### 3.3.1 Diesel and Pump Repair Training

An in-service training course was arranged by Peace Corps Morocco to provide basic French language training (in Tangier) and additional technical training in Lister diesel motor and vertical axis pump repair (in Beni Mellal). The training site in Beni Mellal was to be held at a douar which had experienced pump failure as well as diesel engine failure.

The PCVs were asked during their language training if they planned on attending the motor and pump training. Four said they would plan to come. They felt that two others would be interested as well as two counterparts. The remaining PCVs either could not attend or felt they did not need the additional training at this time. (In fact, five PCVs and one counterpart attended.)

The in-service training had already been arranged by Peace Corps Morocco with Lister Diesel. The consultant phoned the Lister representative who was still in England and discussed manuals needed and tools available. The Lister representative felt that special tools such as the main bearing extractor tool would not be required but could be obtained from a Lister parts distributor if it should be needed. He agreed to bring service manuals and parts lists in English and in French if available.

On September 16 the consultant traveled to Casablanca to pick up the diesel motor and pump parts previously identified as being needed. Arrangements were made with SOFRAMAR, the Alta pump manufacturer and distributor in Casablanca, to have a local supplier in Beni Mellal assist with the pump repair and installation. Pump installation manuals were also obtained.

A meeting was then held in Beni Mellal with the local pump supplier, who is also the local Lister engine supplier. He agreed to have his pump installer help with the training.

The consultant met with the Lister representative on September 19 upon his arrival and discussed training methodologies with him. From this meeting it was ascertained that the Lister representative was a skilled trainer and very keen on hands-on training.

Training started on Tuesday, September 21, 1982. A daily training schedule is provided in Appendix G. After the course had begun and the motor was stripped down, it was learned that the main bearings were worn out and the crankshaft scored. (The old bearings were found to have been improperly installed.) The crankshaft had to be taken to Khouribga, 90 kilometers away. The next day was essentially spent getting necessary parts and machine work done.

On Thursday, the 23rd, the Lister representative and the consultant stopped by the local supplier to pick up the engine block, which had been left to have the bearings pressed out and new bearings pressed in. At this time, it was learned that the supplier did not have the recommended tool for removing or installing bearings. They recommended a machine shop about 20 kilometers away. Upon arrival at the machine shop, it was found that they did not have a bearing press either. In attempting to make a press they slightly bent the bearing during installation. Because of this the crankshaft would not go all the way into the block. It was decided to return to the site and let the PCVs decide whether or not to use the bearing if they could get the crankshaft to seat properly. As it turned out, this could not be done and the motor-block along with a new bearing had to be taken to Khouribga for installation.

Concurrently, the pump installer, the consultant, and the PCVs travelled to the douar and began assembling the pump impellers in the pump bowls, replacing the rubber bearings with new ones and getting the pump ready to lower into the well. At that time a provincial representative came by and said not to install the pump until a telescoping tailpiece could be obtained because they were going to deepen the well in a week or two. Although the pump could not be installed, the group felt that they had learned the essential elements they needed to know and that the training was worth the time and effort.

On Friday and Saturday, the diesel was reassembled and ran for about an hour. It worked well but needed rings which were not locally available. They have been ordered and the PCVs will install them when they arrive.

The Lister representative was favorably impressed by the PCVs. He was quite disturbed by the high price of parts and the general lack of manuals, tools, and parts at the local distributors, and plans to bring this to the attention of Lister in London.

### 3.3.2 Program Review

Discussions with the Peace Corps Director and the Program Director indicated that it would be valuable to visit all of the provinces in which a PCV potable water team had been assigned, whether a PCV was currently there or not. It also

seemed desirable to interview those PCVs who had dropped out of the program, who had changed programs and were still in-country. Discussions were held with PCVs in Rabat, at the training site, and in the provinces. They were asked about the adequacy of their technical training, support by the province, UNICEF and by Peace Corps and for ways in which they felt the program could be improved. From these discussions, the following impressions were gained:

1. Technical training has been adequate and perhaps more than required for the current jobs. All of the PCVs felt they were technically able to do their assigned jobs.
2. More training should have been provided concerning the Moroccan bureaucracy, i.e. structure, paper work, delays, etc.
3. Technical proficiency of the PCVs should have been measured and a pass/fail system applied.
4. The Peace Corps Program Manager was basically doing a good job, but was too lenient with PCVs and not firm enough with provincial officials.
5. A person who understood technical problems and frustrations associated with construction and operation of potable water systems should be available from time to time to provide assistance.

Provincial officials were asked about their satisfaction with PCVs and if they supported the program. No notes were taken while discussing the program with the provincial officials. Questions were asked in accordance with comments made and using a series of guideline questions as shown in Appendix K. After the meeting a brief summary was written.

PCVs were asked to fill out forms (Appendix J) concerning the adequacy of their pre-service training, the perceived job role, and the type of person required to fill it.

With the possible exception of Essaouira, all the provinces visited have had a positive attitude towards the program and are in some phase of initiating projects. While the level of enthusiasm varied, as did the problems, there were several comments by the provincial officials which were the same. These included:

1. PCVs need to continue working on their language to improve communications. Most problems were due to poor communications.
2. The PCVs should stay for a full two years instead of leaving as they wished or when the going was a little tough.

3. The fact that the PCVs had transportation was a big plus due to limitations on fuel and vehicles.

Appendix L is a commentary of the visits to each province in the order visited.

#### 3.4 Other Technical Assistance

During the course of the training and site visits the need for specialized tools and equipment was identified. These included special diesel motor repair tools, safety belts, cast-iron pipe cutting and joining tools, and a pump and motor to train with.

The consultant assisted in identifying the needs and in locating costs and vendors. This was done through phone calls to the IHS in Rockville, Maryland, the WASH Project, and Lister Diesel in England.

## Chapter 4

### RECOMMENDATIONS

#### 4.1 Program Continuation

This program is desired and needed by the six provinces with whom meetings were held. It is recommended that the Peace Corps continue its potable water program in Morocco, provided that the Moroccan Government requests its presence and agrees to the following:

1. A detailed job description for the Peace Corps Volunteer be provided.
2. A counterpart be assigned with specific written agreements as to working relationships and objectives.

#### 4.2 Volunteer Selection

An assignment to the Moroccan Government requires PCVs to adhere to rather strict rules and work procedures. Additionally, reports are the rule rather than the exception. As a result many PCVs feel very frustrated. This frustration could be somewhat alleviated if the potential PCVs were informed of these job elements in order to weigh their desire to work within this type of structure prior to accepting an assignment.

#### 4.3 Training

##### 4.3.1 Pre-service Cultural Training

Future training should include, early on, Moroccan bureaucratic procedures. Cultural sessions should include several days in the province, preferably with a PCV, rather than a "home stay".

##### 4.3.2 Pre-service Technical Training

Pre-service in-country technical training should continue to be provided prior to language training. Realistic training objectives should be identified and a minimum technical level achieved. This should be measured through performance-oriented objectives. Technical training should include the elements provided during stateside training. Stateside training should include ductile and cast-iron pipe, construction scheduling, and operation and maintenance organization as appropriate. Windmills, vertical axis turbine pumps and diesel motors should be emphasized.

#### 4.3.3 Technical In-Service Training

Additional in-service training in operation and maintenance organization should be considered. This might be accomplished along with the in-country training of the next potable water group. A descriptive hand-out should be developed which explains the importance of a timely maintenance program for managers and decision makers at the province level. A graphic presentation on slides would also be helpful. A series of operation and maintenance training manuals could be developed, utilizing the U.S. Public Health Service-Indian Health Service material as a model.

#### 4.4 Communication Barriers

That the PCVs need to continue improving their language skills goes without saying. As important is inter-governmental communications. It is felt that better links need to be established between Peace Corps Morocco and the appropriate Moroccan Government agencies. This would allow for quick, unofficial responses to possible problems.

In addition, the Peace Corps should establish contacts within the various agencies which have a concern for potable water. This includes the Ministry of Health, the Ministry of Agriculture, etc. In this way all the resources which are available could be identified and possibly used. It also would help to obtain program support and recognition.

#### 4.5 Technical Support

The Peace Corps provide more technical support to its PCVs. Ideally, the potable water program Manager would be able to provide this technical assistance. If the Program Manager does not have the technical skills, then arrangements should be made to have one or more people visit the volunteers on a semi-annual basis to provide that support. This is especially important in the first six to nine months. One way to accomplish this would be to assign a PCV to a central government agency in Rabat to act as a team leader.

#### 4.6 Language

The Peace Corps should train future volunteers in French if the primary role continues to be centered at the provincial level. It is very important that the volunteers be able to communicate with their peers and supervisors. Most of the technical subject matter is also in French.

#### 4.7 Assignment Locations

If the Province of Essaouira has not become active in the potable water program by November 15th, the PCVs should be reassigned to a province which has demonstrated an interest. Unless very highly qualified PCVs are identified, Peace Corps Morocco should give serious thought to reducing the number of provinces in the program, thus allowing better program support.

## Chapter 5

### CONCLUSION

A review of the potable water program in Morocco indicates that the program is very slow in getting off the ground. This has happened because the provincial officials are hesitant to expend scarce resources when they know UNICEF intends to provide much of the necessary material and equipment. They also desire to evaluate the technical and personal qualifications of the PCVs before giving them "more rope" so to speak.

The PCVs, on the other hand, feel that "time is of the essence" and that they only have two years to contribute to the program. They are frustrated by Moroccan red tape and the slowness of UNICEF's projects to develop.

Much of the hesitation on the part of the province and the frustration on the part of the PCVs is beginning to dissolve as they get to know each other better. The delivery of equipment and material by UNICEF will force close cooperation even if it does not come naturally due to the need to construct, operate, and maintain potable water systems.

The need is great and those PCVs who have stayed on are having a much greater positive impact than they will probably ever know. It is the consultant's opinion that they, as well as those they are paving the way for, will be able to see the fruition of these initial efforts sooner than they may realize.

Finally, the recommendations concerning developing links and improving communications are important not only to keep PCVs and provincial officials happy but also to improve program efficiency and the Peace Corps image. This will result in more rural water systems being built, improved, operated and/or maintained, which everyone is working towards.

APPENDIX A

WATER AND SANITATION FOR HEALTH (WASH) PROJECT  
ORDER OF TECHNICAL DIRECTION (OTD) NUMBER 111  
August 24, 1982

Camp, Dresser & McKee, Inc.  
WASH PROJECT

AUG 31 1982

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

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

SUBJECT: Provision of Technical Assistance Under WASH Project  
Scope of Work for USAID/PC/Morocco (Training)

REFERENCES: A) RABAT 6265, 23 Aug 82  
B) STATE 232586  
C) RABAT 6069, 13 Aug 82  
D) RABAT 5896, 7 Aug 82

1. WASH contractor requested to provide technical assistance to USAID/PC/Morocco as per Ref A, para 1-6 and Ref D, para 2.
2. WASH contractor/subcontractor/consultants authorized to expend up to 38 person days of effort over a 3 month period to accomplish this technical assistance effort.
3. WASH contractor authorized up to 30 person days of international and domestic per diem to accomplish this effort.
4. Contractor to coordinate with USAID/PC/Morocco, PC/W (Mr. Bell), NE/TECH/HPN (Mr. Haratani), Morocco Desk Officer, and S&T/H/WS (Dr. J. Austin) and should provide copies of this OTD along with periodic progress reports as requested by NE Bureau or S&T personnel.
5. Contractor authorized to provide up to one(1) international round trip from consultants home base through Washington D.C. for briefing and preparation to Morocco and return to consultants home base thru Washington D.C. for debriefing and report finalizing.
6. Contractor authorized local travel within Morocco as necessary and appropriate to accomplish effort NTE \$400 without the prior written approval of the AID Project Manager.
7. Contractor authorized to obtain secretarial, graphics, reproduction or technical services in Morocco as necessary to accomplish tasks NTE \$900 without prior written approval of AID WASH Project Manager. These services are in addition to the level of effort specified in para 2 and para 3 above.
8. Contractor authorized to expend up to \$800 for the training materials for the development or printing/support services associated with Ref A para 4.

9. Contractor authorized to provide for car rental if necessary to accomplish technical assistance effort. USAID/PC requested to support consultant to maximum extent possible with vehicle support as appropriate
10. Contractor authorized to have consultants conduct training programs in various parts of Morocco as appropriate. Contractor authorized to purchase local parts, materials and supplies to be used in the training programs. NTE \$800 without the prior written approval of the WASH Project Manager.
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. Contractor to provide coordinated draft report to USAID/PC as per Ref A para 6 and report should fully describe training development and implementation effort that occurred during consultant TDY. Final report due to USAID/PC within 30 days of consultant return to U.S.
14. USAID/PC should be contacted immediately and technical assistance initiated before the end of Sept 82 or as convenient to Mission.
15. Appreciate your prompt attention to this matter. Good luck.
16. New procedures regarding subcontractor cost estimates and justification for selection of consultants/subcontractors remains in effect.

APPENDIX B

ITINERARY

Madras, Oregon to Washington, DC	September 8, 1982
Washington, DC to Tangier	September 11-12, 1982
Tangier to Rabat	September 14, 1982
Rabat to Casablanca and return	September 16, 1982
Rabat to Beni Mellal	September 17, 1982
Beni Mellal to Rabat	September 18, 1982
Rabat to Beni Mellal	September 20, 1982
Beni Mellal to Azilal and return	September 21, 1982
Beni Mellal to Marrakech and return	September 22, 1982
Beni Mellal to Marrakech	September 23, 1982
Marrakech to Essaouira to Rabat	September 24, 1982
Rabat to Khouribga	September 30, 1982
Khouribga to Settat to El Jadida	October 1, 1982
El Jadida to Safi to Rabat	October 2, 1982
Rabat to Washington, D.C.	October 6-7, 1982
Washington, D.C. to Madras, Oregon	October 9, 1982

APPENDIX C

OFFICIALS INTERVIEWED

USPHS-IHS/Rockville Md.

Gary Hartz, Technical Training Director, Technical  
Training Stateside Morocco

US PEACE CORPS/Washington, D.C.

William Dant, Peace Corps Morocco Desk Officer  
James Bell, OPTC/PC

US EMBASSY/Rabat

Theodore Curran, Chargé d'Affaires

USAID/Rabat

James Bowers, Health, Population and Nutrition Officer

US PEACE CORPS/Rabat

Baudouin de Marcken, Director  
Ahmed Morabet, Program Officer  
Stephanie Sweet, Training Co-ordinator

United Nations, UNICEF, Rabat

Bernard Gilbert, Conseiller en Eau Potable

Province of Azilal, Government of Morocco

Governor of Azilal Province  
Secretary-General  
Technician, Rural Technical  
Super Caid Cercle  
Michael Messina, PCV  
Marc Andreini, PCV

Province of Beni Mellal, Government of Morocco

Secretary-General  
Director, Bureau Technical  
Chef, Bureau Technical  
Joseph Robillard, PCV

.../.

Province of El Kelaa-des Srarhna, Government of Morocco

Secretary-General

Province of Essaouira, Government of Morocco

Kurt Bringgold, PCV

James Vicino, PCV

Province of Khouribga, Government of Morocco

Secretary-General

Lewis Brittain, PCV

Scott Leaming, PCV

Province of Safi, Government of Morocco

Secretary-General

Director

Edward Brady, PCV

William Lynch, PCV

## APPENDIX D

### Scope of Work

The scope of work for this assignment is as follows:

1. Discuss the evolution of the project to date with Peace Corps staff (September 15-17).
2. Provide technical assistance to Peace Corps staff in preparation for the diesel repair trouble-shooting course to be conducted by the Lister Diesels Services Engineer in Beni Mellal Province (September 15-17).
3. Brief the Lister Engineer on appropriate training approaches for work with PCVs (September 20).
4. Conduct a needs assessment during the diesel repair course for providing technical assistance to PCVs at their sites (September 21-22).
5. Prepare a work plan and schedule for technical training visits to the Volunteers, including identification of materials and equipment needed (September 23-25).
6. Conduct individualized in-service training at the PCV worksites selected in item 4 above (September 27-October 2).
7. Prepare a draft report for the Peace Corps on the first seven months of the Potable Water Project with recommendations for the following:
  - future directions of the program
  - type of experience and qualifications for future PCV requests
  - future training needs, both pre-service and in-service.
8. Submit a final report to WASH no later than October 20th on the above topics plus a description of the in-service training actually conducted.
9. Conduct a debriefing at the WASH office upon your return to the U.S.

APPENDIX E

IMPORTANT DOCUMENTS

Ministère de l'Intérieur, Projet d'Alimentation en Eau Potable Dans le Milieu Rural. Royaume du Maroc, Année 1980

Sebastian, Harvel, Development and Rehabilitation of Rural Potable Water Supplies for Morocco 1981, A study performed for AID. Rabat, Morocco, October 1980-January 1981.

Agency for International Development, Program Information Document, "Douar Water Systems", Rabat, Morocco, March 1981

Sherer, Keith, Technical Training of Peace Corps Volunteers in Rural Water Supply Systems in Morocco, a report prepared by the WASH Project for USAID - Morocco. Washington, D.C., January 11 - February 23, 1982.

## APPENDIX F

### TRAINING OBJECTIVES

The training was conducted in the classroom and in the field, with special emphasis on the field component. It included those elements of a water supply program that would allow the PCV to recognize problems, develop solutions and implement corrections to assure the development and continued operation of potable water systems. At the completion of the training the volunteer would be able to:

#### Recognize problems

- 1) Determine if the water system, including the sources, pump, storage and distribution, is adequate.
- 2) Determine if operation and preventive maintenance are adequate.
- 3) Determine if the pump and controls are operating correctly.
- 4) Determine if the motor is functioning properly as designed.
- 5) Identify sources of potential contamination.

#### Develop Solutions

- 1) Prepare a plan and materials list for providing a potable water system.
- 2) Design a plan for operation and preventive maintenance of the system.
- 3) Prepare a pump parts list, identify resources needed and where they can be obtained.
- 4) Identify the cause of malfunction, prepare a diesel parts list, identify resources needed and where they can be obtained.
- 5) Prepare recommendations for correction potential pollution of the water.

#### Implement

- 1) Install pumps, motors, and controls, and make necessary adjustments.

- 2) Repair diesel motors.
- 3) Implement a comprehensive long range operation and maintenance program.
- 4) Assist with water system construction.
- 5) Assist in removing pollution and safety hazards.

APPENDIX G

Daily Training Schedule  
For Lister Diesel and Pump Repair

Day and date	Activity	Instructor
Tues, Sept. 22	Diesel motor strip dowy	Lister
Wed, Sept. 23	Diesel motor parts installed	Lister
Thurs Sept. 24	Diesel motor machine work Pump repair and installation	Lister Consultant
Fri, Sept. 25	Diesel motor assembly	Lister
Sat, Sept. 26	Tune motor and operate	Lister

APPENDIX H

SESSION SUMMARY SHEET

1. Session Title: Diesel repair Date: 9/21-25/6

2. Session Type (circle one): Time: 24 hours

Field

Classroom

Instructors: Heslie Forrest - Lister Field Rep.

3. Materials Needed:

Tools, manuals, motor parts, motor oil, diesel fuel, gasket set, gasket cement

4. Learning Objectives:

Identify properly operating motor, learn to strip a Lister SR 1 series diesel motor, identify necessary parts and mechanics. Make repair, reassemble, tune & time and place in operation.

5. Order of Activities:

1. Locate a source for motor parts and special tools
2. Assess diesel motor skill levels
3. Strip engine, make measurements, have mechanics done
4. Assemble and operate motor

6. Evaluation of Session:

Excellent hands on training. Mistakes were made and corrected adding to the learning experience. A vehicle is a necessity.

SESSION SUMMARY SHEET

1. Session Title: Vertical axis pump repair Date: 9/23/82

2. Session Type (circle one): Field Time: 8 hrs

Field

Classroom

Instructors: Keith Sherer, local pump installer

3. Materials Needed:

Pump repair parts, drive shaft, bearings (new),  
Pump column w/new bolts, pump drive head

4. Learning Objectives:

1. How to disassemble a pump, install new parts and reassemble.
2. How to install a vertical axis deep well pump and make necessary adjustments

5. Order of Activities:

1. Locate a source of parts
2. Strip the pump & repair
3. Reassemble & install in well - make adjustment
4. Run pump to check

6. Evaluation of Session:

The pump repair went very well. The installation did not as the well was dry and the Province wanted to deepen it,

APPENDIX I

In-service Training Needs Survey

This survey is to identify areas of technical training which would be helpful to you in accomplishing your assignment. This might include refresher training as well as the introduction of new subject matter. The following questions are being asked to help in the preparation of future training. It will be appreciated if you will fill this form out fully.

1. How would you describe your duties.

Activity	Percent of Time	
	Present	Future
Project construction -----		
Project developement -----		
Community surveys -----		
Developing O&M Organizations -----		
Other (describe) -----		

2. What technical subjects would you like additional training in considering your job needs?

3. When do you feel this training would be most beneficial.  
6 mo (Sept), 9 mo , 1 year (circle one)

4. Should the training be preceeded by a field visit to your Province by the technical trainer? yes / no

5. Are there specific technical problems within your Province that require the assistance of a technical consultant?  
yes/no--Describe

6. Are there specific technical manuals which you need? Specify.

7. Comments.

APPENDIX J

POSITION DESCRIPTION/REQUIREMENTS

If you were designing a potable water position for this Province, what would the position be?

What is the minimum training/education/experience you would desire for the position?

Technical training:

Educational level/type:

Experience:

APPENDIX K

GUIDE FOR QUESTIONS FOR PROVINCIAL OFFICIALS

Have the PCVs been adequately trained?

Is Arabic the best language for them?

Are you satisfied with the volunteers?

Does your office directly support the potable water program?

What difficulties have you experienced?

Some of the difficulties experienced by the PCVs at other locations include:

Transportation

Availability of parts and miscellaneous technical support

Lack of a counterpart

is this a problem here?

## APPENDIX L

### Field Notes

#### Beni Mellal - September 17th

Originally three PCVs were assigned here. Two of the PCVs were a husband and wife team, who are in the process of transferring to another program.

The Secretary-General was very complimentary of the remaining volunteer and would like several more. He said to please send people "who will stay for two years, not just a few months." (This was in reference to the married couples' leaving.) He also stated that the PCVs should work very hard to improve their language skills. He was asked if there was a possibility of assigning PCVs at the cercle level, rather than the provincial level. He stated that yes, after the province knows the volunteers' ability and skills, there was a definite possibility, but certainly not before the PCV was evaluated and knew the administrative "ropes."

The Chef du Bureau was also please with the volunteer, but felt that he needed to improve his communication skills. The PCV felt he was appreciated and supported. He is currently taking additional language training.

#### Azilal - September 21st

There were originally three PCVs assigned here. One was transferred to Safi to fill a termination. One is presently being assigned to UNICEF to act as a liaison between Peace Corps and UNICEF. He will also provide support to the Province.

A meeting was held between the Governor, the Secretary-General, PCVs, Peace Corps Director and the consultant. The Province had elected to do the UNICEF projects with Province labor rather than by contract. This decision was based on the availability of PCVs to coordinate construction. Since they have several projects, they were not happy to have lost one volunteer plus now they are losing a second one. (In fact the third one had decided to leave but changed his mind.) Some of the frustrations of the volunteers were voiced and answered by the Governor. He felt that the PCVs should have come to him with their problems rather than quitting. These problems centered around getting miscellaneous small items and support when needed. He agreed to a Dh.1,000 reimbursable account as needed and an open-door policy to discuss problems.

The Governor stated that much of the problem was in communications and language barriers. Perhaps these barriers have been partially crossed.

Upon our arrival at the two project sites, much of the trenching had been accomplished within the last two weeks (the volunteers had been trying to get this accomplished for the past several months). Technical assistance was provided in a spring design problem, cast-iron pipe-cutting and installing, and bedding and thrust blocking. This was done at two sites for which construction is about to start. Trench excavation is underway and some of the pipe has been delivered. The pipe is concrete-lined cast-iron in 4- and 5-inch diameter and is 6 meters long. A current problem is lack of fittings, i.e. tees and angles, a pipe-cutting tool and a pipe-puller to join the pipe. In Morocco a pipe-cutter costs \$1,000. UNICEF is aware of these problems and is working on them.

#### El Kelaa - September 22nd

The married couple originally assigned to El Kelaa have terminated.

A meeting with the Secretary-General indicated that he wanted PCVs in his Province and had had very good experiences with them in the past 20 years. He wants the PCVs to be in the field and to help with setting up an O&M organization. He stated that the two PCVs were unlike any he had met in the past, and perhaps it was for the best that they had left. When asked about a reimbursable account such as established in Azilal, he said this was not necessary as parts and material would be purchased as needed by the Province.

There are some large UNICEF projects and numerous small ones scheduled for the Province. Some material has already arrived. The Secretary-General would like Peace Corps involvement in this effort.

#### Essaouira - September 24th

A meeting had been scheduled with the Secretary-General, but was cancelled. The Director of the Bureau Technique was also not available. This was due to an unexpected meeting called by the Governor.

Neither of the PCVs feel they are wanted or supported in the Province. A report they prepared concerning windmills has been ignored or at least set aside. There are some new windmills at the dock in Casablanca, but authorization has not been given to pick them up. One of the PCVs is interested in staying if he can be of help in getting the projects going. The other wants to leave preferably for another more receptive province or job.

#### Khouribga - September 30th, October 1st

The two volunteers originally assigned there have stayed. They have slowly been increasing their role in the Province.

The Secretary-General was familiar with what they were doing and was impressed with the survey of existing systems along with a system by system report, listing deficiencies they had found. He was also aware of their participation in repair of systems and stated that the Province planned to use this as a model for a Province-wide O&M program which had not been done before. He stated that they were pleased with the PCVs to date and that they would be playing a more active role when the UNICEF material arrived.

A trip was made to the field, where several maintenance projects were observed and where the PCVs would like to install hand-pumps or windmills. One project consisted of the removal and repair of the foot valve of a pump. The diesel motor did not have enough compression to pump water, however. The douar president asked the PCVs to check out the motor and they agreed to do so.

Technical assistance was provided in vertical axis pump adjustments, sizing and placing centrifugal pumps, pump controls, small project development, and methods of obtaining funds for small projects. O&M was discussed and the possibility of using parts from various windmills to get several back in operation.

#### Settat - October 1st

of the two PCVs originally assigned to Settat Province, one is left. The other was transferred to Ben Slimane Province, where both volunteers had left. The remaining PCV had been assigned to the Autonomous Agency for Distribution of Water (RADEEC), which is a Provincial Agency responsible for providing potable water to rural areas in the Province. He had been given responsibility to develop two projects which were to be funded shortly. If he had additional time he could work on UNICEF potable water projects. When UNICEF projects became active, he would spend full time on them. His supervisor, who was the Director of RADEEC, said he was doing a good job and that they were pleased to have him. An engineer in the Department is available for technical assistance.

The acting Secretary-General was also familiar with the PCVs' activities and very supportive.

Technical assistance included hydraulics and pump sizing and spring development.

#### Safi - October 2nd

Two volunteers had been assigned here and one had left early. He was replaced by one of the PCVs from Azilal.

A meeting with the Secretary-General indicated that they were pleased with the PCVs. He was particularly impressed with the Province-wide survey they had conducted. He stated that they

planned to split the Province into three sections and have a maintenance team for each section. This was contingent on the delivery of equipment from UNICEF.

The volunteers have been quite active with developing sources of material within and without UNICEF. One of the volunteers was in Rabat due to an injury. The other felt that satisfactory progress was being made.

El Jadida and Ben Slimane Provinces

These Provinces were not visited due to the lack of time. At present, no PCVs are on site. However, one is due to return to Ben Slimane from sick leave.