















## **Water and Sanitation Technologies: A Trainer's Manual (Peace Corps, 1985)**

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### **Session assessment**

**PLEASE RATE THE SESSION USING THE SCALES PROVIDED AND ADD ANY COMMENTS**

#### **1. Clarity of the objectives of the day's sessions.**

---

1      2 3 4 5 6 7 8 9

Unclear

Very Clear

**Because** \_\_\_\_\_

## 2. Achievement of objectives.

---

1            2 3 4 5 6 7 8 9

Very poor                      Well done

**Because** \_\_\_\_\_

## 3. Effectiveness of lead trainer.

1            2 3 4 5 6 7 8 9

Very poor                      Excellent

**Because** \_\_\_\_\_

## 4. Effectiveness of methods used.

---

1            2 3 4 5 6 7 8 9

Ineffective                      Very effective

**Because** \_\_\_\_\_

## 5. Usefulness of exercise sheets and handouts.

---

1            2 3 4 5 6 7 8 9

Not useful                      very useful

**Because** \_\_\_\_\_

## 6. Usefulness of the day's sessions to help you in your training or community.

---

1	2 3 4 5 6 7 8 9
Largely irrelevant to my training and/or life as a PCV	Highly useful for my training and/or life as a PCV

Because \_\_\_\_\_

**7. In the space below, write any comments or criticism you would like to give the staff as individuals or as a group.**

---

**8. What could have made these sessions more worthwhile for you in relation to the job you have in your workplace and/or community?**

---

**9. What specific sessions or activities did you find most helpful to you in your work and life?**

---



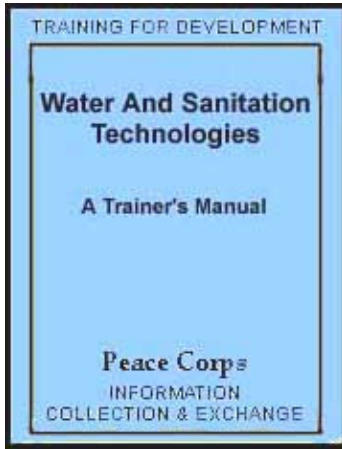
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 **(introduction...)**

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### Critique sheet for trainers using this manual\*

**Please complete and return to U.S. Peace Corps Office of Training and Program Support, Water/Sanitation Specialist, 806 Con. Ave. NW, Room M 701, Washington, D.C. 20526.**

**\*Please attach separate pieces of paper if additional writing space is required.**

**1. What did you find most helpful in this manual? \_\_\_\_\_**

**2. What did you find least helpful? \_\_\_\_\_**

**3. Which sessions did you actually use? \_\_\_\_\_**

**4. Did you use them as they were written? Yes/No \_\_\_\_\_**

**5. Were they used during PST or 1ST? \_\_\_\_\_**

## 6. How did you find the objectives of sessions?

very clear \_\_\_\_\_

clear \_\_\_\_\_

average \_\_\_\_\_

confusing \_\_\_\_\_

very confusing \_\_\_\_\_

If you found them confusing, please comment on how they could have been made clearer: \_\_\_\_\_

## 7. Were the trainer preparation notes:

very helpful \_\_\_\_\_

helpful \_\_\_\_\_

not helpful \_\_\_\_\_

distracting \_\_\_\_\_

not read \_\_\_\_\_

If they were not helpful, please explain why. \_\_\_\_\_

## 8. Were the sessions

very easy to follow \_\_\_\_\_

easy to follow \_\_\_\_\_

average in difficulty \_\_\_\_\_

difficult to follow \_\_\_\_\_

very difficult to follow \_\_\_\_\_

If they were difficult to follow, please explain what could have made them easier to follow. \_\_\_\_\_

**9. How would you rate the appropriateness of the sessions to your training program's needs?**

- 1 very appropriate \_\_\_\_\_  
 2 moderately appropriate \_\_\_\_\_  
 3 appropriate \_\_\_\_\_  
 4 not appropriate \_\_\_\_\_  
 5 inappropriate \_\_\_\_\_

**10. How would you rate the appropriateness of the sessions to Volunteers needs?**

- 1 very appropriate \_\_\_\_\_  
 2 moderately appropriate \_\_\_\_\_  
 3 appropriate \_\_\_\_\_  
 4 not appropriate \_\_\_\_\_  
 5 inappropriate \_\_\_\_\_

**11. Please explain any problems you had with the sessions.** \_\_\_\_\_

**12. What would you change about the manual for future use?** \_\_\_\_\_

**13. What additional sessions would you like to see included in any future revisions?**

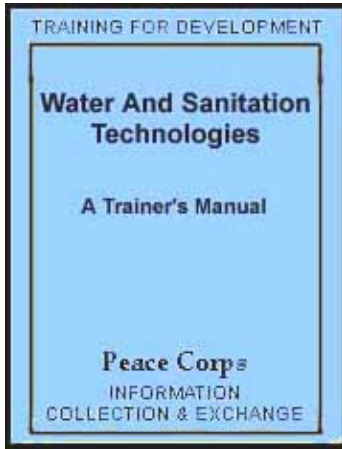
\_\_\_\_\_

**14. Additional remarks about the sessions or manual:** \_\_\_\_\_
















**Thank you for completing this critique sheet.**



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### **Bibliography**

**1. McJunkin, F. Eugene. Hand Pumps, Technical Paper No. 10. International Reference Center for Community Water Supply and Sanitation, The Hague, Netherlands, 1982.**

**Excellent text on hand pumps used all over the world. Includes helpful diagrams, maintenance procedures, and information on research and development. Limited availability through ICE.**

**2. National Academy of Sciences. More Water for Arid Lands. Washington, D.C., 1974.**

**Discusses little known but promising technologies for the use and conservation of scarce water supplies in arid areas. Available through ICE.**

**3. Nostrand, John Van, and Wilson, James G. Rural Ventilated Improved Pit Latrines: A Field Manual for Botswana. International Bank for Reconstruction and Development/The World Bank, Washington, D.C., 1983.**

**An easy to read, straight-forward description of how to construct a Botswana VIP latrine. Available through ICE in 1986.**

**4. DHV Consulting Engineers. Shallow Wells. Amersfoort, Netherlands, 1979.**

**Fully documents a shallow wells program in Tanzania with interesting text and color pictures. Available through ICE**

**5. Stulz, Ronald. Appropriate Building Materials. SKAT, Swiss Center for Appropriate Technology and Intermediate Technology Publications, Ltd., London, England, 1981.**

**The book describes a broad range of building materials, from adobe, bamboo, and sisal, to concrete, soil/cement, and cinvaram. Also includes information on building elements: foundations, floors, walls, ceilings, and roofs. Available through ICE.**

**6. Stern, Peter, and Longland, F. Field Engineering. Intermediate Technology Publications, Ltd., London, England, 1983.**

**The book covers a broad range of engineering topics, from building houses, roads, and bridges, to water resource development and sanitation. Easy to read and informative. Limited availability through ICE.**

**7. Dancy, Rev. Harold K. A Manual of Building Construction. Intermediate Technology Publications, Ltd., London, England, 1977.**



**This is a reprint of Rev. Dancy's original 1948 manual. It provides information on all topics of building construction. Though somewhat difficult to read, it contains excellent information and helpful drawings.**

**8. Armstrong, William. Better Tools for the Job: Specifications for Hand Tools and Equipment. Intermediate Technology Publications, Ltd., London, England, 1980.**

**This book describes how to make simple hand tools useful in all kinds of construction. Contains easy to follow instructions and clear drawings.**

**9. Watt, S.B., and Wood, W.E. Hand Dug Wells and Their Construction. Intermediate Technology Publications, Ltd., London, England, 1977.**

**A very useful manual, containing step by step procedures for well construction. Available through ICE.**

**10. Helvetas, Swiss Association for Technical Assistance. Manual For Rural Water Supply. Swiss Center for Appropriate Technology, Zurich, Switzerland, 1980.**

**A somewhat technical text, which provides guidelines for identifying, planning, organizing, and implementing water projects. Available through ICE.**

**11. White, Gilbert F. Drawers of Water. University of Chicago Press, Chicago, Illinois, 1972.**

**Useful background reading on the broad implications of water supply, seen from a social-technical angle. Lmted availability thru ICE.**

**12. Perennial Energy Inc. A Training Manual In Conducting a Workshop in the Design, Construction, Operations, Maintenance, and Repair of Hydrams. Peace Corps, Washington, D.C., 1981.**

**Presents detailed session designs and handouts for training development workers in**

**hydraulic ram technology. Available through ICE.**

**13. Farallones Institute and CHP International. A Training Manual in Appropriate Community Technology: An Integrated Approach for Training Development Facilitators. Peace Corps, Washington, D.C., 1982.**

**Presents detailed session designs for training development workers in various appropriate technology fields. Contains effective sessions on the role of the Volunteer in development. Available through ICE.**

**14. Edwards, Dan, and McCaffery, Jim. The Role of the Volunteer in Development, Core Curriculum Resource Materials. Peace Corps, Washington, D.C., 1981.**

**Contains ten structured training sessions, dealing with various core curriculum skills. Available through ICE.**

**15. Hornung, Wm. J. Builders Vest Pocket Reference Book. Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1955.**

**Handy guide to measures, calculations, and conversions necessary for construction using carpentry, masonry, and/or concrete. Available through ICE.**

**16. Werner, David. Where There is No Doctor. Hesperian Foundation, Palo Alto, California, 1977.**

**The basic health reference for all Peace Corps Volunteers. Written for villagers and for primary health care workers. Available through ICE.**

**17. World Health Organization. Health Education: Methods and Materials in Primary Health Care. Peace Corps, Washington, D.C., 1982.**

**A series of articles on various aspects of health care and education. Contains case studies**

**from South America and Africa. Describes innovative approaches to health education. Available through ICE.**

**18. U. S. Department of Agriculture. A Manual on Conservation of Soil and Water. Peace Corps, Washington, D.C., 1982.**

**A basic handbook for professional agricultural workers. It covers such topics as soil erosion, land capability, and irrigation. Available through ICE.**

**19. Development Planning and Research Associates, Inc. Small Scale Irrigation Systems for Peace Corps Volunteers. Peace Corps, Washington, D.C., 1983.**

**Basic irrigation principles and techniques, primarily in relation to soil, plants, and water. Available through ICE.**

**20. McJunkin, F. Eugene. Water and Human Health. USAID, Washington, D.C., 1982.**

**This book provides a detailed overview of the relationship between water and human health. It concentrates on water-related disease categories, and provides detailed descriptions. Available through ICE.**

**21. Jordan, D. Thomas. Handbook of Gravity-Flow Water Systems for Small Communities. UNICEF, Kathmandu, Nepal, 1980.**

**This is an excellent reference manual for surveying, designing, and constructing gravity water systems. There are many detailed drawings which cover the entire spectrum of gravity water systems. Available through ICE.**

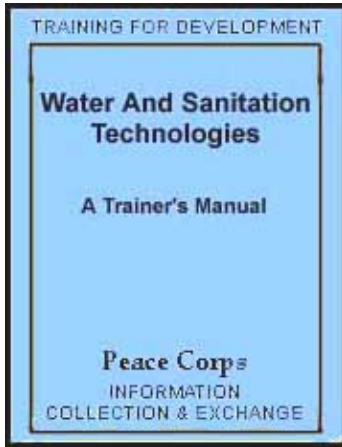
**22. Faiia, A. Scott. Practical Design Notes for Simple Rural Water Systems. CARE, Indonesia, 1982.**

**This is a technical paper which presents practical design methods for small-scale gravity**
















## water systems.



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### **Peace corps water and sanitation sector background**

**During the last 20 years, Peace Corps has assigned over 4,000 Volunteers to work in water supply and environmental sanitation projects throughout the developing world. Over 200 Peace Corps projects with water and/or sanitation as primary activities have been identified**

**for the period from 1970 to the present. This history of projects integrating water or sanitation activities demonstrates Peace Corps' performance in meeting the needs of the poor and improving quality of life through:**

- **provision of clean water supplies to reduce morbidity and mortality;**
- **provision of water supplies where there were none before;**
- **development of small-scale enterprise opportunities;**
- **use of irrigation to improve food production and provide year-round domestic water supplies;**
- **institution building; and**
- **prevention of water-related diseases through health education.**

**Many Peace Corps projects have had a water supply or sanitation component as a primary activity although they may have been classified as agriculture, health, rural infrastructure, municipal works, natural resource conservation, or community development projects. (Water activities related to the fisheries sector were not included in this research.) Water and sanitation are probably the most common threads through the various sectors, the most binding elements in an integrated approach to development. This is particularly noteworthy considering the 200 projects do not include all the Peace Corps teachers, community development workers, agriculturalists, and engineers who worked outside their primary "project" area to construct wells, latrines, pumps, and irrigation systems, or to teach sanitation and prevention of water-related diseases such as malaria, onchocerciasis, and schistosomiasis (bilharzia).**

**This sustained effort by Peace Corps over the years has trained and educated co-workers and villagers, created employment opportunities, developed villager self-help skills, created income-generating opportunities, and saved water from distant sources. (Peace Corps' Water and Sanitation Sector, 1981, p.1.) In addition, Peace Corps efforts have produced numerous technical materials, publications, and manuals on water/sanitation which have had a wide impact on development.**

## **The Job**

**Volunteers are assigned to a wide variety of water and sanitation projects in collaboration with host country ministries, voluntary agencies, and international development agencies. The Volunteers serve as water engineers, technicians, drillers, construction supervisors, irrigation specialists, health educators, and community organizers. They design and build water facilities and train counterparts to build water systems, wells, protect springs, distribution networks, storage tanks, and a wide variety of appropriate technology water devices. There are abundant examples of improved wells, springs, dams, catchments, water systems, appropriate water pumping devices (hand pumps, hydraulic rams, windmills), and latrines maintained by local people that are the result of Peace Corps Volunteer involvement. The work has gained recognition from heads of state, government officials, and international development agencies.**

**As inspectors, community health workers, educators, and community organizers for sanitation projects, Volunteers organize village health committees; coordinate community latrine, garbage collection, and water source improvement projects; educate villagers; and strengthen public health extension networks.**

## **Volunteer Numbers**

**Perhaps because of increased awareness regarding the importance of water and sanitation needs since the declaration of the UN International Drinking Water Supply and Sanitation Decade, requests for Volunteers in this sector have been on the increase since 1978; however, exact figures are available only since 1980. In December 1980, a Peace Corps survey revealed 334 Volunteers working in water supply and sanitation projects, with the largest number serving in Africa. A year later, the total number of Volunteers in water and sanitation projects had increased to 350, with a 51 percent increase in Africa. At the writing of this report, figures for 1982 were incomplete, but indications based on requests from countries, data on current training programs, and information contained in the**

**Supply/Demand Survey were that the total number of Volunteers would not be lower than 350 and could be higher than 400.**

**The number of projects increased from 46 in 1980 to 51 in 1981. However, the increase in projects and water/sanitation Volunteers took place at the same time that total Volunteers in service overseas declined from 5,400 in 1980 to 5,100 in 1981. Analysis of the 1980-81 Volunteer Activity Survey Reports\* suggests that almost 20 percent of all Volunteers - more than 1,100 - were involved in water supply and sanitation projects as primary, secondary, or tertiary activities in 1980.**

**\*Produced by Peace Corps' Office of Planning Assessment and Management Information.**

**The Supply/Demand Survey of 1982, a Peace Corps/Washington field survey of anticipated needs for Volunteers by sector, was conducted by the Office of Training and Program Support (OTPS) to collect information on major trends for future programming. The data are to be used to define Peace Corps policy in recruitment, programming, and training assistance, as well as budgetary allocations. Preliminary results of this survey, available as of March 1983, indicated that the largest single number of Volunteers requested were for water supply (293) and irrigation (126) projects. This figure represents more than 12 percent of the total number of Volunteers requested. (Tomaro, John B., An Assessment of the Water and Sanitation Sector in the Peace Corps Program: Role of the Office of Program Development, Research Triangle Institute, 1983.)**

### **Common Problems of Water Projects\***

**The common problems associated with Peace Corps rural water projects parallel to a large degree those stated in the World Bank Paper, Village Water Supply (March 1976). Although they naturally overlap, the problems are grouped into three broad categories in the paper- institutional, financial, and technological.**

**\*This section is excerpted from a 1979 survey of potable water projects by the**

**Water/Sanitation Sector Specialist in OTAPS. (Hafner, Craig, Water and Sanitation in the U.S. Peace Corps, 1979.) Many of these problems prevail today in projects with water/sanitation components.**

### **INSTITUTIONAL:**

- **There is lack of a rural water supply policy forming part of a national water supply policy.**
- **There exist several government agencies whose lines of responsibility overlap or are ill-defined.**
- **There is a lack of institutions capable of project development.**
- **There is a lack of water organizations at the local level.**
- **There is a lack of trained manpower at every level.**
- **There is a lack of criteria for project evaluation and priority selection.**

### **FINANCIAL:**

- **Per capita costs, for a given level of service, increase as village size decreases.**
- **Villagers have relatively low income and there are limited village financial resources.**
- **There is a lack of policy to obtain maximum financial support from areas to be served.**
- **There is a lack of local government infrastructure, an inability to collect and retain locally collected taxes for local use, and difficulty in collecting fees for water users.**
- **There is a lack of village motivation and of public health education, so that villagers are unaware of the potential benefits of improved water systems and are not willing to pay for**



**them.**

- **The rural population may return to water from ponds, streams, shallow wells, and other sources of questionable quality if high charges for piped water are imposed.**

#### **TECHNOLOGICAL:**

- **Records show a short operating life for equipment, poor maintenance, and many project failures.**
- **There is a lack of local capacity to fabricate simple, reliable equipment for which spare parts and service would be available locally.**
- **The various national agencies use a wide variety of types and makes of equipment, compounding the problem of operation and maintenance.**
- **Severe communications problems exist between remote rural systems and their support organizations, so that system breakdowns are not reported promptly.**
- **There is difficulty in obtaining spare parts due to lack of money, scarcity of foreign exchange, cumbersome procurement procedures, problems of logistics, and absence of a support agency which maintains an inventory of needed parts.**
- **There is difficulty in providing sufficient repair staff and transport to attend promptly to breakdowns, especially when breakdowns occur in widely dispersed rural systems with very poor road links.**

**According to Water and Sanitation in the U.S. Peace Corps (Hafner, Craig, 1979), by far the most crucial problems are the institutional and financial ones; if these could be resolved, the technological problems would largely disappear.**

#### **Water Resource Management: An Integrated Approach**

**Peace Corps water/sanitation programming for the 1980s aims to develop more fully the supportive role of water/sanitation work in agriculture, environmental conservation, and health and other programs. More and more Volunteers may be using water-related skills to develop livestock watering points or small-scale irrigation systems for crop production, including household gardens. These activities can increase food supplies and cash incomes as well as provide nutritional variation and water supplies for year-round domestic use.**

**Similarly, encouraging water conservation practices can provide better potable water supplies, while erosion control efforts prevent flooding and maintain water tables.**

**Water supply, sanitation, and health are closely inter-related in Peace Corps programming. Improved sanitation and availability of water in or near villages reduce exposure to the vectors of malaria, onchocerciasis, and schistosomiasis. Improvements in the accessibility and quality of water are important in the reduction of dysentery and guinea worm. (Jones, B., Household Water Supplies, 1981, p. 7.) On the other hand, a possible increase in disease vectors must be dealt with in planning irrigation schemes.**

**The Jones report states that providing water without sanitation or education on the relationship of water, sanitation, and disease may only conserve the energy of the water carriers and have little impact on the levels of disease and death. Water is necessary for improved health, but is not effective without supporting factors. "Personal and domestic hygiene, storage, water-use patterns and sanitation all determine, to some degree, whether water supply improvements will contribute to the realization of health benefits." (Jones, 1981, p. 12). Since diarrhea! diseases and malnutrition are cyclical, each contributing to the severity of the other, it is important, says Jones, to improve nutrition as well as provide clean water supplies.**

### **The Role of Women**

**Because women draw the water, bathe the children and educate them in hygiene, launder the clothes, and do the kitchen gardening, they are the principal targets of water and**

## **sanitation activities.**

**...because cultural inhibitions can and do provoke misuse and underuse of safe water supply and waste disposal systems, it is critical that adequate health education and community participation efforts involving women become integral components of planning strategies. Third world women, the traditional drawers and carriers of water, can play a significant role in promoting community acceptance of improved water supply and sanitation programs....Until women are involved and understand the importance of good sanitation, we can expect limited acceptance. Once the women understand, they can play key roles in household decisions relating to changing behavioral patterns and to socializing children in similar behavior and attitudes in areas such as personal hygiene and sanitation. (Elmendorf, Mary, Women, Water, and Waste: Beyond Access, pp. 9 and 12.)**

**Recognizing the basic role of women in water and sanitation aspects of daily living, 30 non-governmental organizations at the 1977 UN Water Conference in Mar del Plata issued the following statement for developing countries to consider when preparing their national plans.**

- (a) Include strategies to develop human resources at the community level to meet local needs.**
- (b) Ensure equal access for women to training with regard to the maintenance, management, and technology of water sources and supplies.**
- (c) Ensure that women be included in any educational programs on the use of water and its protection from contamination.**
- (d) Ensure the participation of women in local councils and planning boards responsible for making decision on community water supply.**
- (e) Recognize the increasingly effective role that women, NGOs, and other women's**

**organizations can play in the education of public opinion for needed change.**

**("Special Situation of Women in Regard to Water," Statement prepared by the Non-Governmental Organizations Committee on UNICEF for the Preparatory Committee, United Nations Water Conference, January, 1977, from Elmendorf, p. 10.)**

**Most Peace Corps water and sanitation projects in the past have not included host country women, but many have begun to do so. Paraguay's Environmental Sanitation and Rural Health Projects are good examples of an integrated approach to water, sanitation, and health education involving women at all stages.**

### **Washington's Coordinating Efforts**

**Over the years, programming in the area of water/sanitation -as in other areas - has become increasingly complex. Water supply and sanitation activities now often take place in the context of an integrated approach to development involving many other program areas. Community involvement, especially of women, is now recognized as a primary requisite for success.**

**Assistance is available to Peace Corps programmers attempting to deal with these complexities in the field through the Water/Sanitation Sector, Office of Training and Program Support (OTAPS). The sector office was established in 1979 to focus on improving the quality of Peace Corps' programming and training in water/sanitation. Early sectoral efforts centered on potable water and sanitation in response to the emphasis of the U.S. Water Decade and the goal of meeting basic human needs.**

**Sectoral efforts have expanded in the 1980s to encompass water resource management and sanitation activities in support of projects in agriculture, health, and other areas emphasized in the Forward Plan. The water/sanitation sector staff coordinates technical information, ideas, and consultants to support water and sanitation activities in all sectors in the field; develops strategies to improve the quality and increase the quantity of both projects and**

**pre-service and in-service training models; and encourages appropriate collaboration among Peace Corps, private voluntary organizations (PVOs), and international donor organizations participating in the UN Water Decade.**

**This collection of case studies is another tool for improving the quality of Peace Corps' programming and training in water and sanitation. Looking at the following case studies and analyses, the reader may note the improvements over time in areas such as Volunteer training, use of counterparts, development of national rural water supply policies and coordinating committees, and community participation. Each country takes a different approach to the degree of integrated programming and the methods of solving administrative, managerial, and financial problems. All have valuable lessons to offer others working in water/sanitation worldwide.**

**REPRINTED: Peace Corps Water/Sanitation Case Studies and Analyses, compiled by Diane Talbert, Peace Corps ICE, Case Study Number 4, 1984.**

**Since 1961 when the Peace Corps was created, more than 80,000 U.S. citizens have served as Volunteers in developing countries, living and working among the people of the Third World as colleagues and co-workers, Today 6 000 PCVs are involved in programs designed to help strengthen local capacity to address such fundamental concerns as food production, water supply, energy development, nutrition and health education and reforestation.**

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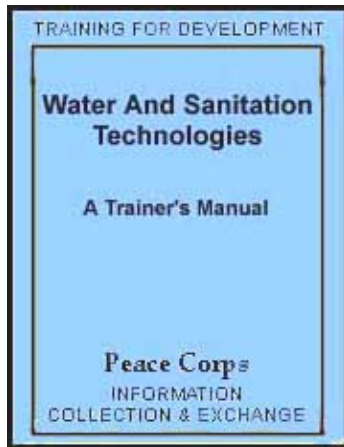
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## Acknowledgements

**The content and format for the training program presented in this trainer's guide were developed primarily during the 1984-85 Peace Corps Appropriate Technology/ Renewable**

**Energy/Water and Sanitation Pre-Service Stateside Training Program, conducted by the Denver Research Institute and Domestic Technology International. I would like to thank all trainers and trainees who participated in those programs for their conscientious efforts and valuable contributions.**

**The U. S. Indian Health Service, which for several years, designed and conducted Peace Corps Water and Sanitation training, has also made a valuable contribution to the formulation of this training program. In particular, I would like to thank Ralph Hogge, engineer for the Indian Health Service, who first introduced me to the field of water and sanitation.**

**In addition, I would like to thank Jim Bell, Peace Corps Water and Sanitation Specialist, for giving me the opportunity to write this Trainer's Guide, and for lending his knowledge and support throughout the process. My thanks also go to the many people who have contributed by giving me permission to use materials they have developed.**

**Lastly, I wish to thank my wife Karen, for her work as illustrator, and for her support and assistance during the entire project.**



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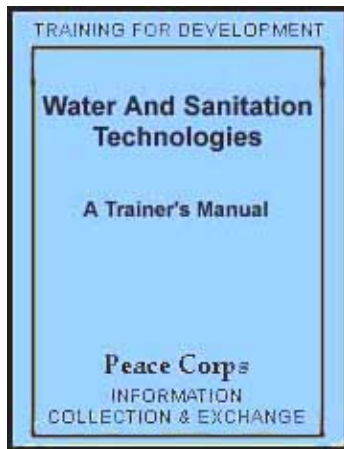
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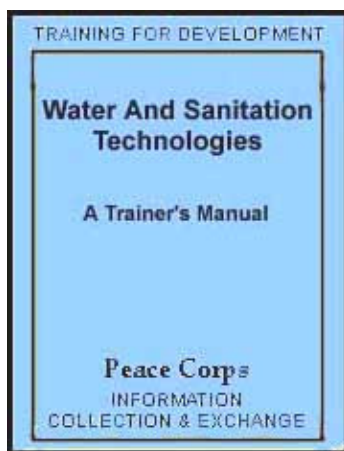
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## **Introduction**

**This Trainer's Guide contains the basic curriculum for a Peace Corps Water and Sanitation Pre-Service Training Program. The subject matter was developed, over the last six years, to prepare Peace Corps Water and Sanitation Technicians and Engineers for field service by integrating technical training with community organization techniques. It consists of 222 total hours of training time, for a six to eight week training program, depending on the specific conditions of the particular program.**

**The manual is primarily a technical training guide, providing the trainer with an outline of instruction designed to equip the technician and engineer with the necessary skills for successful field work as a Volunteer. Therefore, it may be used as the principal training guide for a water and sanitation course, or supplemented with material from the Role of the Volunteer in Development manual for a complete Pre-Service Training Program. Portions of the manual may also be used separately, for specific instruction in a single subject, such as ferro cement construction, or spring capping.**

## **Methodology**

**The lesson plans in the manual are based on the principles of adult learning. The basic**



**premise of this theory is that adults learn more effectively by doing, rather than by seeing or hearing. Therefore, trainers will more often be called upon to facilitate a discussion or group exercise on a specific subject, rather than deliver a traditional lecture. Furthermore, non-formal education techniques, such as role plays and visual aids, are used throughout the manual to reinforce the experiential and participatory approach to learning.**

**Many lesson plans incorporate trainees as co-facilitators. Facilitation of sessions, or parts of sessions, by trainees is encouraged, not only to give the trainees the opportunity to improve their communication and facilitation skills, but also to utilize the knowledge and resources of all individuals participating in the program, and create an atmosphere of mutual respect and cooperative learning within the training community.**

## **Session Content**

**The manual contains a total of 44 lesson plans, numbered chronologically, in recommended order of presentation. The suggested schedule is laid out in block form on page 17. There is room for flexibility in the sequencing of sessions to allow for variables such as weather conditions during outside activities. However, trainers are advised that sessions build upon one another to present a progression of information. Therefore, care must be taken if changes are made in the suggested sequence, to insure that the material is still presented in a logical progression.**

**The lesson plans are categorized into five subject areas: Community Development, Project Management, General Construction, Environmental Sanitation, and Water Resource Development. A categorical listing of sessions can be found on page 7, under Training Subject Areas. To assist in the curriculum design of specific training programs, this table includes the number of hours for each session as well as the total number of hours for each subject area.**

**Classroom Activity accounts for 68 hours, or approximately 30% of the total training time. These sessions are intended to provide the basic theoretical background for field projects.**

**In the classroom, trainers and trainees deliver prepared lecturates, facilitate group discussions, present case studies, act out role plays, and use visual aids to illustrate important points.**

**The optimal classroom size is difficult to specify; too small a group, less than five trainees, for example, limits the number of differing ideas and opinions on a subject, and too large a group, over 15 to 20 trainees (per trainer), limits opportunity for individual participation. A number between these two examples will probably provide for the best learning environment. If the number of trainees in a classroom session exceeds 15 to 20 figure, additional trainers should participate as co-facilitators, or the group may be divided and the session presented separately to each group.**

**Field Demonstrations account for another 16 hours, or approximately 10% of the total training time. The purpose of the demonstrations is to introduce basic skills, such as concrete work or drawing, which can be used in a variety of ways. These activities take place in an outdoor setting and are "hands-on" exercises. Active participation by all trainees is essential. For these sessions, the size of the group should be no more than six to eight trainees per trainer. If more trainees need to attend a session, several demonstrations should be set up and run simultaneously by other trainers, or a single demonstration repeated several times.**

**Project Construction accounts for the bulk of training activity, 138 hours, or 60% of the total time. The construction projects are designed to accomplish three objectives: to provide instruction in specific technologies, to develop basic design and hands-on construction technical skills, and to improve management skills.**

**In meeting the first objective, to provide instruction in specific technologies, the construction project sessions in the manual use technologies appropriate to third world countries. One technological method of construction is outlined for each project. However, as there is no one specific method uniformly appropriate for all countries or training**

**programs, adjustments may be made to fit specific requirements.**

**The second objective, development of basic technical skills, is achieved through hands-on experience. Trainees are responsible for formulating a detailed design of the project prior to its implementation. Adequate time is provided for this in the project planning sessions included in the manual. During actual construction, it is important that all trainees practice the hands-on skills necessary to complete each phase of the project.**

**The development of management skills, the final objective, is also attained through direct experience. One or two trainees are selected as project managers for each construction project, and assume responsibility for the organization and implementation of that project from start to finish. This role rotates with each project so that all trainees have the opportunity to act as project managers.**

**The number of trainees participating in a construction work group should be no more than twelve, preferably seven to ten. If a greater number of trainees are involved, additional project sites should be selected. The sites should be as close as possible to the main training center for logistical reasons, and trainers should keep in mind that the time set aside in the manual for each construction session is an approximation, based on past training experience, and does not include time for transportation or other considerations. Time requirements may differ and adjustments may be made accordingly.**

### **Responsibilities of Trainers**

**It is assumed that all trainers who intend to use this manual possess a sound knowledge of the water and sanitation technologies practiced in the third world countries. Furthermore, they should be familiar with the principles of adult learning as applied to Peace Corps training in general. Before the training program starts, all trainers should study the manual and become familiar with its layout, methodology, and technical content. This will enable them to use the manual as intended, and to adapt various sessions to meet the specific needs of each program.**

**Individual sessions generally require some preparation; attachments may need to be reproduced, teaching aids collected, and/or reading assignments reviewed by the trainer. Trainees should be informed of reading assignments well in advance of each session for which a textbook or attachment is used. Furthermore, when a trainee is scheduled to co-facilitate a session, he/she must be allowed ample time to prepare, and trainers should be available during that preparation time to assist the trainee with both technical content and facilitation methods.**

**All reading assignments are taken from books included in the Training Program Textbooks list on page 5 of the manual. These books are all freely available through Peace Corps Information, Collection, and Exchange, and copies of each textbook should be ordered for each trainee. In the event that one or more of the textbooks are unavailable, alternative reference information dealing with the same topic should be substituted.**

**Additional trainer responsibilities include the selection of appropriate construction project sites outside the main training center, and the collection of a supply stock of basic building materials and tools.**

### **Assessment and Evaluation**

**Informal program evaluation procedures are integrated into many sessions. Trainees are also asked to assess their individual progress on a continuous basis throughout the program. The manual, however, does not contain formal procedures for either program evaluation or trainee assessment. It is the responsibility of each training program to develop these components. Trainers may find the Session Evaluation form on page 355 helpful in evaluating specific sessions. The Behavioral Objectives Skills Sheet on page 11 may also be useful in developing evaluation and assessment procedures for a training program.**

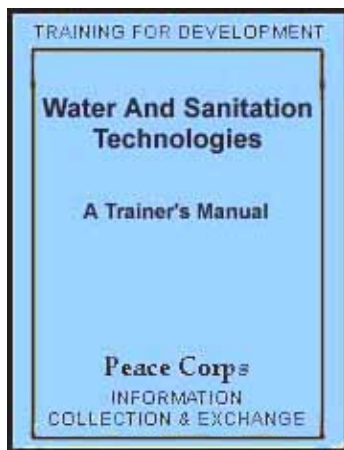
**Lastly, this Trainer's Guide is the first of its kind, in the area of water and sanitation technologies, produced for Peace Corps. I believe that it is a valuable training tool.**

**However, it must continue to be tested, evaluated, and modified under actual training conditions, and made to fit specific program needs and circumstances. If you have any observations or suggestions concerning its contents or teaching methods, please contact Peace Corps, Office of Training and Program Support, Water/Sanitation Specialist. A Manual Evaluation form can be found on page 357 for this purpose.**















**Brad Hanson  
July, 1985**



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### Training program textbooks

All textbooks are available through Peace Corps Information, Collection, and Exchange (ICE).

1. USAID Technical Fact Sheets. Rural Water and Sanitation Projects: Water for the World. Peace Corps, Washington, D.C., 1983.
2. Hofkes, E.H. Small Community Water Supplies, Technical Paper Series 18. International Reference Center for Community Water Supply and Sanitation (IRC), The Hague, Netherlands, 1981.
3. Mann, H.J., and Williamson, D. Water Treatment and Sanitation: Simple Methods for Rural Areas. Intermediate Technology Publications, Ltd., London, England, 1982.
4. Watt, S.B. A Manual for the Hydraulic Ram for Pumping Water. Intermediate Technology Publications, Ltd., London, England, 1975.
5. Mandl, P.E. Assignment Children Journal: People, Water, and Sanitation. UNICEF, Geneva, Switzerland, 1979.
6. Watt S.B. Ferrocement Water Tanks, and Their Construction. Intermediate Technology Publications, Ltd., London, England, 1978.
7. Benenson, Abram S. Control of Communicable Diseases in Man. The American Public Health Association, Washington, D.C., 1975.
8. Pacey, Arnold. Rural Sanitation Planning and Appraisal. OXFAM Document, Intermediate Technology Publications, Ltd., London, England, 1980.

**9. Feachem, Richard, and Cairncross, Sandy. Small Excreta Disposal Systems. The Ross Institute Information and Advisory Service, London, England, 1978.**

**10. Winblad, Uno, and Kilama, Wen. Sanitation Without Water. SIDA, Stockholm, Sweden, 1980.**

**11. Pacey, Arnold. Hand-Pump Maintenance. OXFAM Document, Intermediate Technology Publications, Ltd., London, England, 1977.**

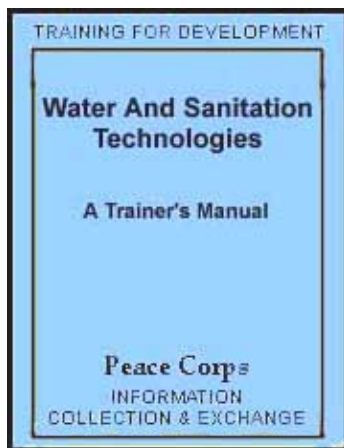
**12. Brush, Richard E. Wells Construction: Hand Dug and Hand Drilled. Peace Corps Information, Collection and Exchange, Washington, D.C., 1980.**








**13. Ashe, Jeffrey. Assessing Rural Needs: A Manual for Practitioners. VITA, Arlington, Virginia, 1978.**









**14. Werner, David, and Bower, Bill. Helping Health Workers Learn. The Hesperian Foundation, Palo Alto, California, 1982.**



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## Training subject areas

**The sessions contained in the manual can be grouped under five basic subject areas. What follows is a listing of the sessions under their respective subject area, including the hours for each session and total hours for the area.**

<b>SESSIONS</b>	<b>HOURS</b>
Community Development: Total hours - 11½	
Session 1 Water and Sanitation Issues in Third World Countries	2
Session 4 Community Mobilization	2
Session 11 Community Water Supply Case Study	2
Session 13 Community Needs and Resource Assessment	2
Session 21 Women and Water	1½
Session 42 Constructing Projects in a Community	2
Project Management: Total hours - 8	
Session 3 Facilitation Skills	2
Session 7 Project Documentation	1½



Session 12 Project Planning and Management	2
Session 43 Proposal Writing	2
General Construction: Total hours - 10	
Session 6 Concrete and Reinforcement	2
Session 8 Field Demonstration: Form work and Pouring Concrete	2
Session 17 Basic Drawing and Blueprint Reading	2
Session 18 Field Demonstration: Block Laying	2
Session 26 Field Demonstration: Pipework and Plumbing	2
Environmental Sanitation: Total hours - 50	
Session 9 Introduction to Environmental Sanitation	2
Session 10 Non-Formal Health Education	2
Session 14 Communicable Diseases and Control	2
Session 15 Excreta Disposal Systems	2
Session 16 Health Education Presentations	2
Session 19 Project Planning: Latrine Construction	2
Session 20 Latrine Construction	38
Water Resource Development: Total hours - 136	
Session 22 Hydrology	2
Session 23 Water Supply Improvements	3
Session 24 Pumps: Installations, Operations, and Maintenance	2
Session 25 Field Demonstration: Pump Assembly and Disassembly	2
Session 27 Principles of Hand-dug Shallow Wells	2
Session 28 Well Site Inspection and Feasibility Survey	2
Session 29 Project Planning: Well Rehabilitation	2

Session 30 Shallow Well Rehabilitation	32
Session 31 Gravity Water Systems- Part I	3
Session 34 Gravity Water Systems - Part II	4
Session 32 Survey and Measurement	2
Session 33 Field Demonstration: Surveying	2
Session 35 Principles of Spring Development	2
Session 36 Spring Site Feasibility Survey	2
Session 37 Project Planning: Spring Development	2
Session 38 Spring Development Construction	32
Session 39 Ferrocement Technology and Construction	2
Session 40 Project Planning: Ferrocement Water Tank	2
Session 41 Ferrocement Water Tank Construction	36
Others: Total hours - 6½	
Session 2 Introduction to the Training Program	2
Session 5 Math Review	1½
Session 44 Training Review and Assessment	3



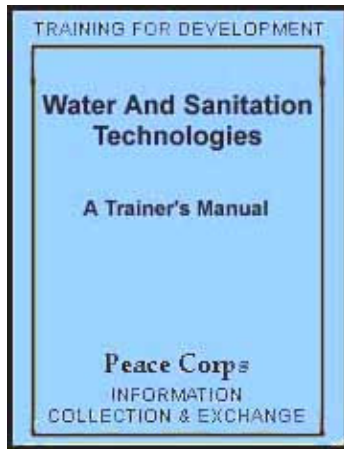
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## Program goals

**The goals for the Training Program presented in this Manual are as follows:**

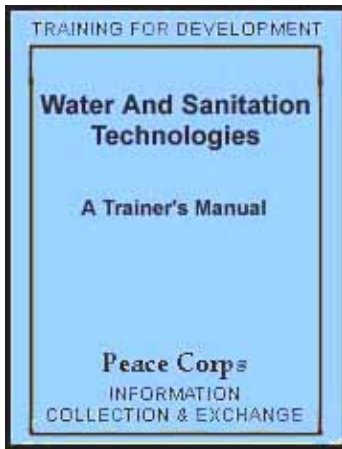
**All trainees participating in the training should develop:**

















- \* a competency in the basic construction techniques used in water and sanitation technologies.**
- \* a basic understanding of the technical information needed to design, implement, and maintain simple rural water systems and sanitation facilities.**
- \* the capability to prepare and deliver educational presentations and facilitate village level dialogues designed to improve the health and sanitary practices in a rural community.**
- \* a proficiency in communication, facilitation, and organizational skills required to assist**

## self-help groups in the improvement of water resources and sanitation conditions in their communities.



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### Behavioral objectives skill sheet

Listed below, by subject area, are the skill objectives contained in this training program. By the end of the training program, all trainees should be able to perform with at least a

**minimum level of proficiency, as determined by the training staff, the following skills:**

## **Community Development**

### **SESSION #1 Water and Sanitation Issues in Third World Countries**

- 1. Articulate important issues, concerning water and sanitation, in third world countries.**
- 2. Discuss various methods of dealing with water/sanitation problems on the Volunteer level.**

### **SESSION #4 Community Mobilization**

- 3. Describe various strategies that a Volunteer could use to mobilize a community for a development project.**
- 4. Practice the group decision making process.**

### **SESSION #11 Community Water Supply Case Study**

- 5. Identify criteria necessary for development of a community water supply system in terms of quality, quantity, and convenience.**

### **SESSION #13 Community Needs and Resource Assessment**

- 6. Describe the role of community survey and assessment in the development process.**
- 7. List information that would be needed to assess a community and various ways to gather that information.**
- 8. Practice developing survey questions and informal interviewing.**

### **SESSION #21 Women and Water**

**9. Clarify views, expectations, and assumptions concerning the relationship between women and water/sanitation problems in developing countries.**

**10. State various ways Peace Corps Volunteers can include women in the development process.**

**11. Discuss ways in which community development can improve the living conditions of women in third world countries.**

### **SESSION #42 Constructing Projects in a Community**

**12. Examine and evaluate the construction of community projects as a cross-cultural experience.**

**13. Relate the construction of community projects during training to future Peace Corps service.**

### **Project Management**

#### **SESSION #3 Facilitation Skills**

**1. Define participative and directive training styles.**

**2. Identify criteria necessary for evaluating facilitation skills.**

**3. Design and carry out an activity using effective facilitation techniques.**

#### **SESSION #7 Project Documentation**

**4. Discuss project documentation as a learning tool used in the training program.**

**5. Relate project documentation to the development process during Peace Corps Service.**

**6. Identify methods of documentation and their applications.**

**7. Demonstrate the ability to document a construction activity during training.**

#### **SESSION #12 Project Planning and Management**

- 8. Analyze factors which influence the management of development projects.**
- 9. Identify practices and procedures which can assist in the management of water/sanitation projects in rural communities.**
- 10. Learn and practice simple methods of managing one's time spent on a project.**
- 11. Demonstrate the ability to manage a small-scale project from design through implementation.**

### **SESSION #43 Proposal Writing**

- 12. Evaluate proposal writing as a method of procuring funds for development projects.**
- 13. Identify and discuss various components of a small-scale proposal.**
- 14. Practice writing a sample proposal for a development project.**

### **General Construction**

#### **SESSION #6 Concrete and Reinforcement**

- 1. List the principle steps in making good concrete.**
- 2. Define the component parts of concrete and demonstrate how they mix together.**
- 3. Discuss water/cement ratios and their effect on concrete strength.**
- 4. Explain the importance of reinforcement in concrete and demonstrate tension and compressive forces.**
- 5. Describe proper curing procedures for concrete.**
- 6. Identify some typical concrete and mortar mixes and ways to estimate proportions.**

## **SESSION #8 Field Demo: Form work and Pouring Concrete**

- 7. Construct proper form work for a concrete slab.**
- 8. Practice mixing concrete, in correct proportions, and pouring a slab.**

## **SESSION #17 Basic Drawing and Blueprint Reading**

- 9. Learn to represent objects by freehand sketching and dimensional drawing.**
- 10. Practice reading and interpreting blueprints.**

## **SESSION # 18 Field Demo: Block Laying**

- 11. Articulate the basic characteristics of three types of masonry bricks: adobe, soil/cement, concrete.**
- 12. Practice correct block laying, using appropriate mortar.**

## **SESSIONS # 26 Field Demo: Pipework and Plumbing**

- 13. Articulate the basic characteristics and correct uses of three types of pipes: GI, PVC and PE.**
- 14. Demonstrate correct methods of cutting and joining different types of pipe, including the assembly of proper fittings and valves for a simple rural standpipe.**

## **Environmental Sanitation**

### **SESSION #9 Introduction to Environmental Sanitation**

- 1. Discuss the relationship between the environment and disease through an understanding of the disease cycle.**
- 2. Identify the causes of water-related disease, common means of transmission,**



**preventative measures, and general treatments.**

**3. Define several important epidemiological concepts.**

### **SESSION #10 Non-Formal Health Education**

**3. Articulate concepts and characteristics of non-formal education.**

**4. Discuss non-formal health care practices in developing countries.**

**5. List techniques and tools useful in non-formal health education.**

### **SESSION #14 Communicable Diseases and Control**

**6. Describe, in detail, various communicable diseases, and effective means to control them.**

### **SESSION # 15 Excreta Disposal Systems**

**7. Identify factors influencing the selection of a community excrete disposal system.**

**8. Describe various types of latrine design and evaluate their relative strengths and weaknesses.**

**9. List the construction steps for a ventilated pit latrine.**

### **SESSION # 16 Health Education Presentations**

**10. Prepare and deliver a health education skit or role play, using appropriate visual aids.**

### **SESSIONS # 19 Project Planning: Latrine Construction**

**11. Formulate a plan for a latrine construction project including a satisfactory design for all components of the latrine, a list of materials and tools necessary, and a construction schedule for the project.**

### **SESSION #20 Latrine Construction**

**12. Construct a ventilated pit latrine using reinforced concrete, adobe block walls, stucco finish, and framed roof.**

**13. Formulate a maintenance plan for the latrine.**

## **Water Resource Development**

### **SESSION #22 Hydrology**

**1. Describe the hydrologic cycle.**

**2. Analyze groundwater hydrology, including aquifers, permeable, and impermeable earthen strata.**

**3. Identify groundwater and surface water characteristics of a watershed.**

### **SESSION #23 Water Supply Improvements**

**4. Articulate basic standards for the quality, quantity, and convenience of a water supply system in a rural community.**

**5. State common techniques used in the field to improve the potability of water in third world countries.**

**6. Describe the basic characteristics and methods for implementation of four water supply sources: well water, rain water, surface water, and spring water.**

### **SESSION #24 Pumps: Installation, Operations, and Maintenance**

**7. Discuss manual and power driven pumping mechanisms and evaluate their applications in rural communities.**

**8. Describe the basic characteristics and applications of four types of pumps: piston (suction lift, force), rotary, centrifugal, and hydraulic ram.**

### **SESSION #25 Field Demo: Pump Assembly and Disassembly**

**9. Disassemble and reassemble a pump head and cylinder for a shallow and deep well hand pump.**

### **SESSION # 27 Principles of Hand-Dug Shallow Wells**

**10. Identify factors that determine a suitable site for a hand-dug shallow well.**

**11. Explain, in detail, various methods of constructing shallow tube wells.**

**12. List proper safety practices that should be followed during well construction.**

**13. Describe the construction steps necessary for a shallow well project.**

### **SESSION #28 Well Site Inspection and Feasibility Survey**

**14. Become familiar with shallow hand-dug wells through a tour of existing well sites.**

**15. Describe the relative strengths and weaknesses of each site with regard to method of construction, safety considerations, sanitary protection, method of retrieving water, and steps for possible rehabilitation.**

### **SESSION #29 Project Planning: Well Rehabilitation**

**16. Formulate a plan for a shallow well rehabilitation project including: a satisfactory design for all components of the well, a list of materials and tools necessary, and a construction schedule for the project.**

### **SESSION #30 Shallow Well Rehabilitation**

**17. Rehabilitate a hand-dug shallow well by constructing a solid inner well foundation, reinforced concrete lining, reinforced concrete sanitary seal, and installation of a method for**

**retrieving water.**

## **SESSION # 31 Gravity Water Systems: Part I**

**18. Define pressure, head, and hydraulic gradient in relation to a gravity water system.**

**19. Analyze friction loss factors influencing the selection of pipe size and type, and calculate pipe flows in a system.**

## **SESSION #32 Survey and Measurement**

**20. Demonstrate approximate methods of surveying and taking measurements in the field using simple instruments.**

**21. Define profiling and explain its applications for the design of piped water systems.**

## **SESSION #33 Field Demo: Surveying**

**22. Practice leveling a survey instrument, reading a rod, and taking notations in the field.**

**23. Complete a ground level traverse using a survey instrument.**

## **SESSION #34 Gravity Water Systems: Part II**

**24. Discuss the following design considerations for a gravity water system: project life, growth rate, consumption figures, and source identification.**

**25. Describe some common design layouts for a simple rural system with these basic components: source intake, storage, distribution, and operation and maintenance plan.**

**26. Design a sample gravity water system.**

## **SESSION #35 Principles of Spring Development**

**27. Identify potential sources of pollution and methods to protect a spring water source.**

**28. Describe two methods of developing a spring water system: simple spring box and infiltration gallery.**

**29. List the construction steps necessary for spring development.**

### **SESSION #36 Spring Site Feasibility Survey**

**30. Using geographic factors and topographical information, find a suitable spring, trace back to its source, and determine spring type.**

**31. Measure the flow of the spring and determine if water quantity and quality is sufficient for development.**

### **SESSION #37 Project Planning: Spring Development**

**32. Formulate a plan for a spring development construction project, including a satisfactory design for all components of spring development, a list of materials and tools necessary, and a construction schedule for the project.**

### **SESSION #38 Spring Development Construction**

**33. Construct a spring development system consisting of a reinforced concrete spring box, water collection point, and adequate protection from potential sources of pollution.**

### **SESSION #39 Ferrocement Technology and Construction**

**34. Discuss the theories and principles of Ferrocement technology as applied to the construction of water tanks.**

**35. Describe the building sequence of a Ferrocement water tank.**

## **SESSION #40 Project Planning: Ferrocement Water Tank**

**36. Formulate a plan for construction of a Ferrocement water tank, including a satisfactory design for all components of the tank, a list of materials and tools necessary, and a construction schedule for the project.**

## **SESSION #41 Ferrocement Water Tank Construction**

**37. Construct a water storage tank using reinforced concrete for the foundation, Ferrocement for the tank walls, and corrugated galvanized iron for the form work.**

## **Other Sessions**

### **SESSION #2 Introduction to the Training Program**

- 1. Familiarize the trainees with the program goals, behavioral objectives, and the training schedule.**
- 2. Review the trainee's strengths and weaknesses with regard to co-facilitation of sessions.**
- 3. Explain the organizational framework that will be used for construction projects during training.**

### **SESSION # 5 Math Review**

- 4. Review simple mathematical formulas, applicable to water and sanitation projects.**
- 5. Practice solving math problems.**

### **SESSION #44 Training Review and Assessment**

- 6. Review and answer questions concerning any information presented during the training**

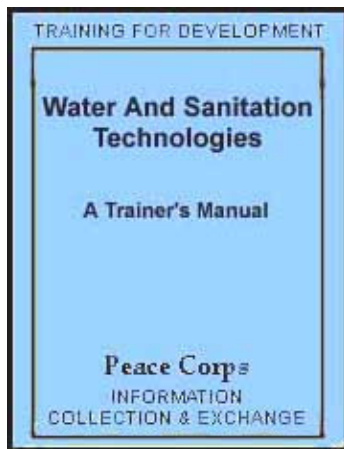
**program.**

**7. Evaluate the overall effectiveness of the training program.**

**8. Assess the progress each trainee has made during the program in relationship to future Peace Corps Service.**



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 **Water and Sanitation Technologies: A Trainer's Manual (Peace Corps, 1985)**

 **(introduction...)**

 **Acknowledgements**

 **Training staff contributors**

 **Introduction**

 **Training program textbooks**

 **Training subject areas**

 **Program goals**

 **Behavioral objectives skill sheet**

  **Block schedule**

 **Sessions**

 **Session assessment**

 **Critique sheet for trainers using this manual\***

 **Bibliography**

 **Peace corps water and sanitation sector background**

## Block schedule

**This is a suggested block schedule for the sessions. The schedule contains seven, 51-day weeks, divided into half-day units. A considerable number of free hours is included to allow for the specific needs and circumstances of each individual program.**

**The majority of classroom activity is scheduled during the morning hours when trainees are most alert. Often, these sessions are followed in the afternoon by hands-on activities which reinforce or demonstrate the theories discussed in the classroom. The construction projects are spaced throughout weeks two to seven, and scheduled to allow adequate time for project planning, and for the curing of concrete when necessary.**

	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>	<b>Saturday</b>
1		Session #2 Intro to the Prog.	Session #4 Comm. Mobilization	Session #6 Concrete	Session #9 Intro to E/S	Session # 12 Project Planning
				Session #7 Documentation	Session #10 Non-Formal Health Ed.	Session #13 Needs/Resource Assessment
	Open	Open	Open			
	Session #1 Water/San Issues in the Dev. World	Session #3 Facilitation Skills	Session #5 Math	Session #8 Form work/Concrete Demo.	Session #11 Water Supply Case Study	
	Open	Open	Open	Open	Open	Free
2	Session #14 Communic.	Session #17 Drawing/Blueprints	Session #20 Latrine Step 1	Session #20 Latrine Step 2	Session #21 Women/Water	Open



	Disease					
	Session #15 Excreta Disposal	Session #18 Block Laying Demo			Open	
	Session #16 Health Ed. Presen.	Session #19 Proj. Plan. Latrines	Open	Open	Open	Free
3	Session #20 Latrine Step 3	Session #20 Latrine Step 4	Session #20 Latrine Step 5	Session #20 Latrine Step 6	Session #22 Hydrology	Session #26 Pipes Demo.
				Session #23 Water Sply Improv		
				Open	Session #24 Pumps	Free
					Session #25 Pumps Demo	
4	Session #27 Shallow Wells	Session #30 Well Rehab. Step 1	Session #30 Well Rehab. Step 2	Session #30 Well Rehab Step 3.	Session #31 Gravity Systems	Session #34 Gravity Systems
	Session #28 Wells					

	Inspection					
	Session #29 Project Planning: Well Rehab.				Session #32 Survey/Measurement	Free
					Session # 33 Survey Demo.	
5	Session # 30 Well Rehab. Step 4	Session # 35 Springs	Session # 38 Springs Step 1	Session # 38 Springs Step 2	Open	Open
		Session # 36 Spring Site Survey				
		Session # 37 Project Planning: Springs			Open	Free
6	Session #38 Springs Step 3	Session #38 Springs Step 4	Session #39 Ferrocement Tech.	Session #41 Ferrocement Step 1	Session #41 Ferrocement Step 2	Session #41 Ferrocement Step 3
			Open			
			Session #40 Project Planning: Ferrocement		Open	Session #41 Ferrocement Step 4
7	Session	Session #43	Session #41	Session #41	Session #41	Session #44

#42 Projs. in a Comm. Open	Proposal Writing	Ferrocement Step 5	Ferrocement Step 6	Ferrocement Step 7	Training Review
Open	Open		Open	Session #41 Ferrocement Step 8	Open

