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WATER AND SANITATION
FOR HEALTH PROJECT

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AID/WASH WORKSHOP ON PLANNING AND DESIGN FOR COMMUNITY WATER SUPPLY IN DEVELOPING COUNTRIES ARLINGTON, VIRGINIA JUNE 28-29, 1985

WASH FIELD REPORT NO. 155
SEPTEMBER 1985

The WASH Project is managed
by Camp Dresser & McKee
International Inc. Principal
cooperating institutions and
subcontractors are: Associates
in Rural Development, Inc.;
International Science and
Technology Institute, Inc.;
Research Triangle Institute;
Training Resources Group;
University of North Carolina
at Chapel Hill.

Prepared for
Office of Health
Bureau for Science and Technology
U.S. Agency for International Development
Activity No.152

WASH FIELD REPORT NO. 155

**AID/WASH WORKSHOP ON PLANNING AND DESIGN FOR
COMMUNITY WATER SUPPLY IN DEVELOPING COUNTRIES**

Arlington, Virginia
June 28-29, 1985

Prepared for the Office of Health, Bureau for Science and Technology
U.S. Agency for International Development
under WASH Activity No. 152

by

Daniel A. Okun

Water and Sanitation for Health Project
Contract No. 5942-C-00-4085-00, Project No. 936-5942
Is sponsored by the Office of Health, Bureau for Science and Technology
U.S. Agency for International Development
Washington, DC 20523

Table of Contents

Chapter	Page
EXECUTIVE SUMMARY.....	ii
1. INTRODUCTION.....	1
2. PLANNING.....	3
3. IMPLEMENTATION.....	5
3.1 Workshop Goals and Agenda.....	5
3.2 Presenters.....	5
3.3 Participants.....	6
3.4 Workshop Notebook.....	6
3.5 Logistics.....	7
4. ASSESSMENT.....	9
4.1 Evaluations.....	9
5. CONCLUSION.....	13
5.1 Workshop Summary.....	13
5.2 Assessment by the Workshop Organizers.....	13
ANNEXES	
1. Initial Workshop Program and Invitation.....	15
2. Final Workshop Program.....	21
3. List of Participants.....	25
4. Workbook Table of Contents.....	37
5. Workshop Evaluation Form.....	41
6. Summary of Workshop.....	49
TABLES	
1. Participants and Evaluators.....	9
2. Achievement of Workshop Goals.....	10
3. Assessment Summary.....	11

EXECUTIVE SUMMARY

The WASH Project assisted the Office of Health, Bureau for Science and Technology of the U.S. Agency for International Development in planning and conducting a workshop on Planning and Design for Community Water Supply in Developing Countries. The workshop, which was held June 28-29, 1985 in Arlington, Virginia, was attended by 56 people, 36 from the United States and Canada and 20 from developing countries. The American participants included consulting engineers, personnel from international agencies such as the World Bank and UNICEF, staff from private voluntary organizations, and USAID officials. The foreign participants were high-level officials from national water supply agencies and a ministry of health.

This workshop was held in conjunction with the annual conference of the American Water Works Association (AWWA), which was held June 23-27. The AID/WASH workshop was scheduled immediately following the AWWA conference. AWWA international activities and the AID/WASH workshop were closely coordinated.

The overall purpose of the workshop was to bring together engineers, planners, and others engaged in the planning of community water supply systems to discuss the issues and options available. The workshop covered a range of topics, including water and health, planning issues, water distribution options and design, pumping and piping, groundwater development, appropriate technology for water treatment, charging for water service, and human resources development. These topics were presented by highly qualified speakers from the United States and Latin American consulting engineering firms, international agencies, USAID, and universities. In addition to these topics, the program included optional evening seminars on handpumps and microcomputers, case studies from different regions, and simultaneous group discussions.

Participant response indicated that the workshop was a success. On a five-point scale -- one being the lowest score and five being the highest -- the ratings for the four objectives ranged from 3.8 to 4.1. Of the other aspects assessed, such as workshop methods, usefulness of notebooks furnished, relevance of content, and logistics, the ratings were in the 3.3 to 4.4 range.

In terms of future workshops, the participants generally agreed on the following recommendations:

- Extend the length of time.
- Cover fewer topics and in greater depth.
- Increase the involvement of engineers from developing countries.
- Place greater emphasis on the planning, institutional, and social issues.

Chapter 1

INTRODUCTION

In 1984, the Office of Health of the Agency for International Development (USAID) asked the WASH Project to organize and conduct a workshop on Planning and Design for Community Water Supply in Developing Countries. The purpose of the workshop was to bring together engineers, planners, and others engaged in the planning and design of community water supply facilities for developing countries, to discuss the issues involved and the wide range of options available. Professionals from developing and industrialized nations were invited.

The annual conference of the American Water Works Association (AWWA) was to be held in Washington, D.C., from June 23 through June 27, 1985. This conference generally attracts many American waterworks professionals who are involved in community water supply practice in developing countries. When the conference enjoys a cosmopolitan and easily accessible venue, it also attracts large numbers of waterworks personnel from developing countries. It also made it possible to attract presenters at little or no cost since many speakers were planning to attend the AWWA Conference anyway. For these reasons, the Office of Health believed that it would be appropriate to conduct a workshop immediately following the AWWA Conference. Accordingly, the workshop was scheduled for June 28 and 29.

WASH Activity Implementation Plan No. 152 was signed on March 5, 1985. Dr. Daniel A. Okun of the University of North Carolina was asked to address the substantive elements of the workshop, including the organization of the agenda and the identification and invitation of the speakers and group session leaders. Solicitation of material for notebooks to distribute to participants as well as the actual conduct of the workshop were also his responsibility. Responsibility for the organizational aspects of the workshop were initially the responsibility of David Donaldson and then of Fred Rosensweig of the WASH Project office. Invitations for participants were issued from the WASH office, while the Office of Health extended invitations by cable to USAID missions. Messrs. F.E. McJunkin and John Austin of the Office of Health maintained a keen interest in and surveillance of the development of the workshop, providing assistance during the preparation phase as well as during its conduct. In addition, they served as presenters during the workshop.

The role of the American Water Works Association was important to the conduct and to the success of the workshop, particularly the contributions of Mr. Kurt Keeley of the AWWA staff, who works for the Committee on International Affairs; AWWA staff have become far more involved recently in activities related to water supply in developing countries. They made a special effort to coordinate their activities with those of the workshop, as did the WASH Project. Illustrative of the joint enterprise are the many activities that were of interest to workshop participants as well as to attendees at the conference, including a session on June 23 devoted to a "Framework for Investments in Water Supply Projects in Developing Countries" conducted by representatives of the World Bank, International Affairs. Forums also were held on maintenance of water systems on the afternoon of June 25 and another on the rehabilitation of systems on the morning of June 26. In addition, AWWA

held special receptions for international visitors and maintained an international visitors' hospitality room. At the close of the conference on June 27th, AWWA organized a field trip to Leesburg, Virginia, which enabled participants to observe a water supply system.

Chapter 2

PLANNING

Planning of the workshop was conducted jointly by personnel of the WASH Project, the author of this report, and staff of the Office of Health of USAID. Several criteria and objectives were established as follows:

1. The number of participants was to be limited to approximately 50, thereby allowing active participation by those in attendance.
2. Invitees were to include officials of water supply and related agencies in developing countries; members of consulting engineering firms; staff of international and voluntary organizations involved in planning, designing, constructing, or operating water supply facilities in developing countries; and representatives of USAID missions who have, or expect to have, water supply projects.
3. Presenters were to be selected from those with experience in water supply in developing countries, representing a wide diversity of organizations, including consulting engineers, international agency representatives, university personnel, and engineers from developing countries.
4. Recognizing that even 50 participants would be too many for discussion purposes and that to these 50 would be added many of the presenters who would (and did) remain throughout the workshop, some mechanism had to be provided for encouraging individual participation.
5. A notebook with handout material related to each presentation would be made available to each participant at the time of registration for the opening session.

Chapter 3

IMPLEMENTATION

3.1 Workshop Goals and Agenda

The goals for the workshop were to:

1. Present to the participants the approaches and techniques being used by those successfully planning, designing, and managing community water supply systems in the developing world.
2. Improve the knowledge and awareness of the participants of the successful, alternative technologies and approaches that are being used.
3. Present a series of case studies designed to demonstrate how different regions have approached the problems of community water supply.
4. Provide written information to the participants that reinforces the presentations.

The initial program, which was prepared for distribution to the participants, is attached (Annex 1). With any such assemblage of presenters, all with international responsibilities, it was to be expected that some would find that overseas obligations would prevent their participation and alternate presenters would, therefore, need to be found. The final program (Annex 2) shows that relatively few such changes were necessary. It is appropriate, at this juncture, to express gratitude to Dr. Dennis Warner, Deputy Director of the WASH Project, who on short notice replaced Leo St. Michel, WASH Project Director, in welcoming participants; Paul Dreyer of CDM, who replaced Mr. St. Michel as leader of the Urban Water Supply Section of one of the simultaneous group sessions; Mr. Daniel Coyaud of the World Bank, who replaced Mr. Fritz Rodriguez in describing the water supply situation in the Middle East; and Mr. Hans Van Damme of the International Reference Center in the Hague, who replaced Harold Shipman as the summarizer.

Two program elements encouraged individual participation. One was the organization, one each day, of three simultaneous group sessions dedicated to considerations of problems facing rural, community, and urban water supply projects. The first day was devoted to technical issues and the second to financial and institutional issues. The second element was the use of simultaneous roundtables on the evening of the first day, which were optional but well attended. One was devoted to handpumps and the other to the role of microcomputers in water supply projects.

3.2 Presenters

A total of 22 presenters participated in the conduct of the workshop, as indicated in the final program. They included six consulting engineers, four from the United States and two from Latin America; five representatives of

international funding agencies, with three being from the World Bank, one from UNICEF, and one from the Pan American Health Organization; two University of North Carolina faculty members, and four U.S. Government agency employees, three from USAID and one from the Peace Corps; and three WASH Project employees; the representative of the International Reference Center; and the president of the American Water Works Association. Presenters are shown in Annex 2. Their full addresses appear in Annex 3.

3.3 Participants

In addition to participants from the United States and Canada, at least 12 other countries were represented, including Belize, Bolivia, Burkina Faso, Colombia, the Dominican Republic, Egypt, Guatemala, Mauritania, The Netherlands, Nicaragua, Oman, and Yemen.

Not including presenters, 56 participants registered for the workshop, 36 from the United States and Canada, and 20 from foreign countries, 15 of whom were from developing countries. Of the American participants, the largest number came from amongst consulting engineers who practice in developing countries, five from international donor agencies, four from USAID, and three from private voluntary organizations. The U.S. participants ranged in experience from relatively new to developing country work to highly experienced. Although most were engineers, some were program developers who lacked strong technical backgrounds. Of the foreign representatives, 12 were from national water supply agencies and 3 from a ministry of health. Almost all of the foreign participants were engineers with high-level positions.

3.4 Workshop Notebook

Each participant was presented with a loose-leaf notebook. A copy of the Table of Contents for the workbook is shown as Annex 4. In addition, each participant was given a copy of the USAID publication Water and Human Health by F.E. McJunkin and the WASH-sponsored book Surface Water Treatment for Communities in Developing Countries by C.R. Shulz and D.A. Okun. Every presentation, other than the luncheon addresses, was represented in the notebook. Additional material also was distributed from time to time during the workshop.

The organization of the workbook, as well as the order of presentation at the workshop, followed a rational sequence beginning with the relationship between drinking water and health then moving through planning issues, water distribution, including pumping and piping, groundwater development, water treatment, financing and, lastly, human resources development. In addition, sessions were devoted to case studies in four geographical areas, Latin America, the Middle East, Africa, and Asia, together with a special presentation on USAID policy and practices in procurement of materials and personal services.

The luncheon speakers included Martin Beyer of UNICEF, who presented an overview of the current status of water supply in developing countries and Richard Miller, President of the American Water Works Association, who described the services performed by the AWWA that are of interest and value to

those responsible for activities in the water supply sector in developing countries.

The presentations for the evening sessions on handpumps and microcomputers were less formal than the other sessions, with far more give and take involving participants. In particular, the microcomputer session allowed some of the participants to essay distribution system studies on a modest scale. The simultaneous group sessions on rural, community and urban water supply were led by moderators who had been given sets of questions which were used as a basis for the discussions.

3.5 Logistics

The workshop was held at the Westpark Hotel in Arlington, Virginia, within easy walking distance of the WASH Project office and the Rosslyn Metro stop. The main meeting room for the workshop was large enough, but its shape did not facilitate the use of visual aids. In addition, excessive light detracted from the quality of some of the slides. Technical difficulty with the slide projector also occasioned some delay.

On the more positive side, the side rooms available for the group sessions and the evening sessions were excellent. Because most of the participants and presenters from outside the Washington area were staying at the Westpark Hotel, there was no pressure to leave the building. The optional evening seminars continued until late, thereby allowing ample opportunity for productive informal discussion amongst participants and presenters. In fact, the informal contacts were most productive especially during the coffee breaks in the morning and afternoon.

Chapter 4

ASSESSMENT

4.1 Evaluations

Participants were given evaluation forms, a copy of which is attached as Annex 5, and asked to submit them at the conclusion of the workshop. Of the 56 participants, 43 submitted complete evaluations. Table 1 summarizes the total number in attendance by general categories, together with those who submitted completed evaluation forms.

Table 1
Participants and Evaluators

<u>Participants</u>	<u>In Attendance</u>	<u>Completing Evaluations</u>
American Consulting Engineers	13	7
International Organization Employees	8	8
Overseas Participants	20	12
USAID	4	2
Students	5	5
Others	<u>9</u>	<u>9</u>
Total	59	43

The evaluations called for ratings from 1, which would represent the poorest outcome, to 5, which would be the highest outcome. For example, in assessing whether the goals of the workshop were met, the evaluators would provide a rating of 1, if not met, while if met very successfully, a rating of 5 would be given. In evaluating methods, a rating of 1 would indicate that the method was not helpful, while a rating of 5 indicated that it was most helpful.

Table 2 summarizes the participants' assessments regarding whether or not the workshop met each of four goals. Except for a somewhat lower rating for the case studies, the responses indicated that in general the goals were met, with ratings ranging from 3.8 to 4.1. Specific comments from participants indicated that more case studies should have been done by those who actually participated in the work, as was done in the case for Africa. In fact, many of the participants mentioned the Malawi case study as being exemplary. Other case studies tended to be more in the nature of sector studies.

Table 2						
Achievement of Workshop Goals						
Objective Not Met	1	2	3	4	5	Objective Met Very Successfully
1. Present approaches and techniques to be used in planning, design, and management of water supplies in developing countries.						
Participants' Response	0	3	7	28	5	Mean 3.8
2. Improve participant knowledge of alternative technologies and approaches being used successfully.						
Participants' Response	0	1	11	24	7	Mean 3.9
3. Present a series of case studies that will demonstrate how different regions have approached the problems of community water supply.						
Participants' Response	2	4	15	13	8	Mean 3.5
4. Provide written information that reinforces presentations.						
Participants' Response	0	2	4	19	13	Mean 4.1

Regarding the overall subject matter, most of the participants viewed the workshop as being too devoted to technology, while some felt that such an emphasis was needed. One participant summed it up well by recommending that this workshop might well lead to other more focused workshops that would give more time to each subject but with fewer subjects.

The notebooks received considerable commendation, although it is clear that they were not fully explored in the limited time available. Several individuals requested information sources, not recognizing that just such a list was included in Section 2 of the notebook.

The participants were asked to check the three presentations that were most valuable to them. Those were the following (in order of perceived value): (1) appropriate technology for water treatment, (2) community water supply planning issues, (3) water distribution options and designs, and (4) human resources development. Surprisingly, the evening seminars and all of the case studies were far down on the list.

Nevertheless, as shown in Table 3, the optional evening seminars enjoyed the highest rating of all of the methods of presentation. In part, this high

rating stems from the fact that it was evaluated by a smaller number of participants, those who attended these optional sessions.

Table 3

Assessment Summary

	Mean
1. Methods helpful to learning	
Lectures	3.4
Full group discussions	3.5
Simultaneous, smaller group discussions.	3.6
Case studies	3.4
Optional evening seminars.	4.1*

*NOTE: Only 34 participants, probably those attending these seminars, responded.

2. Usefulness of notebooks	4.2
3. Ability to apply ideas in present employment.	3.4
4. Relevance of content of workshop to present work.	3.6
5. Translation would have helped (for those not native English-speaking)	3.0
6. Conference facilities	3.3
7. Lunches	4.4

Many of the participants would have preferred more of an opportunity for discussion by all of those present. Such an arrangement would have been possible only with smaller groups, which was ultimately recommended. Furthermore, participants appreciated the obvious difficulty in covering such a wide a range of subjects in so little time and recommended, therefore, that future workshops focus on fewer issues.

The assessment of participants' ability to apply the ideas presented during their present employment might well have been assessed somewhat differently, except that several of the participants clearly came to get a first understanding of the problems of water supply in developing countries, preparing to change their employment to undertake new careers in this field. Many came to this workshop as recently employed individuals with private voluntary organizations to work in developing countries; others came planning to seek such employment.

Participants who took the AWWA-sponsored field trip to the Leesburg Water Treatment Plant in Virginia were asked whether that type of field trip might

be part of future workshops. Of the seven overseas' participants, six indicated that such field trips are valuable.

Finally, the following information was in response to a query concerning improvements that might be made in subsequent workshops:

- More time, 3-1/2 to 5 days should be allotted for future workshops.
- More involvement should be encouraged of engineers from developing countries, both in terms of the contributions they might make to technology transfer to engineers from industrialized countries and in terms of providing them with insights regarding problems in the field.
- Somewhat more attention might be given to the actual rural water supply situations, with a greater representation from the private, voluntary, nongovernmental organizations.
- Some would have all technical information deleted and emphasize objectives, programming, planning, institutional arrangements, policies, and the like. (It is interesting to note that the overseas participants found that institutional development and human resources development were the two most important needs.)
- Others felt that workshops need to provide more technical information and in greater depth.
- The overseas' participants would all have preferred to have the written material earlier or at least to have more time to study it during the workshop. They would have preferred not having the evening seminars.
- Some questioned the omission of any presentation on sanitation, a vital component of the Water Decade program.
- Lastly, as moderator of the workshop, the author of this report came in for a commendation of questionable value: "He kept the conference on schedule." One is reminded of that national leader whose sole claim to fame was that he made the trains run on time.

Overall, the participants and the presenters were pleased, and many expressed gratitude for having been given an opportunity to attend.

Chapter 5

CONCLUSION

5.1 Workshop Summary

Mr. Hans Van Damme, Director of the International Reference Center for Community Water Supply and Sanitation in The Hague, Netherlands, attended the workshop and made a summary presentation at the end. An edited version of this summary is included as Annex 6. It gives the reader a sense of the substance of the workshop and the types of issues that were discussed.

5.2 Assessment by the Workshop Organizers

It is the opinion of the workshop organizers that similar programs should be held in the future. The interest, degree of participation, and the number and background of people that attended indicate that the workshop was most appropriate and valuable. It appears that the workshop, particularly for U.S. participants, struck a chord. Programs such as this, which focus on developing country issues, are not often held in the United States despite the relatively large number of professionals and volunteers who work on water supply and sanitation in the developing world.

If workshops such as this one are held in the future, certain improvements are recommended:

1. Limit the number of topics and explore them in greater depth.
2. Limit the number of participants to 40, to achieve a higher degree of participation.
3. Reduce the number of presenters, with some being required to prepare material specifically for the workshop and being active throughout the workshop.
4. Decrease the emphasis on lectures and include more time for smaller group discussions with the presenters.
5. Consider a three-day workshop to allow more time to go into topics in more detail.
6. Write terms of reference for the presenters to ensure that they address the topic in a way that meets the workshop goals.
7. Give more attention to the facilities, particularly to the room, which should have tables for participants as well as lighting designed for the use of visual aids. A back-up slide projector would be useful.

Despite these suggestions for improvement, the workshop was considered successful. The expertise of the presenters, the enthusiasm of the participants, and the overall pace of the workshop contributed to a productive event.

ANNEX 1

Initial Workshop Program and Invitation

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**Workshop on
Planning and Design
for Community Water Supply
in Developing Countries**

June 28-29, 1985

The Agency for International Development will sponsor the workshop following the Annual Conference and Exposition of the American Water Works Association in Washington, D.C. The workshop will be managed by the Water and Sanitation for Health (WASH) Project with the participation of the University of North Carolina at Chapel Hill.

Location: Westpark Hotel, 1900 North Fort Meyer Dr., Arlington, VA 22209, (703-527-4814), near Rosslyn Metro Station.

Applications: Form should be sent to Mr. Fred Rosensweig, WASH, 1611 North Kent Street, Arlington, VA 22209. Tel. (703)243-8200. Early application is suggested as enrollment is limited to fifty.

Fee: \$80 check to be made payable to ESE-University of North Carolina and mailed with application to WASH. Fee includes handout materials, lunches and coffee.

**PLANNING
AND
DESIGN
FOR
COMMUNITY
WATER
SUPPLY**

AN AID/WASH WORKSHOP

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Objectives of Workshop

To provide engineers, planners and others engaged in the planning and design of water supply facilities for communities in developing countries with an opportunity to join with knowledgeable professionals in discussing the issues involved and the wide range of options available.

PROGRAM

Friday, June 28

8:30 a.m. Registration

Participants will indicate which of the afternoon group sessions and evening seminars they would prefer to attend.

9:00 a.m. Welcome

Leo St. Michel, Senior Vice-President, Camp Dresser & McKee, and WASH Project Director

9:15 a.m. Water and Health

F.E. McJunkin, Chief, Community Water Supply and Sanitation, Office of Health, Bureau of Science and Technology, AID

The impact of water supply and sanitation projects on public health, productivity and community development help establish the priority for WS&S projects.

9:45 a.m. Community Water Supply Planning Issues

Daniel A. Okun, University of North Carolina

Levels of service, population and area to be served, quantity and quality, institutional arrangements, and financing are some of the major issues that need to be resolved before detailed project planning can be undertaken.

10:30 a.m. Break

11:00 a.m. U.S. AID Procurement Policy in the Water Sector

Rod MacDonald, Chief Engineer, Office of Development Resources, Bureau for Latin American and the Caribbean

The policies of external financing organizations in the procurement of local (in-country) and foreign resources in personnel, services, and material need to be known in project planning.

11:30 a.m. Discussion

John Briscoe, University of North Carolina

12:15 p.m. Lunch - Martin Bayer, Senior Policy Specialist, Water and Environmental Sanitation Team, UNICEF

1:30 p.m. Water Distribution Options and Designs

Donald T. Lauria, University of North Carolina

Communities in developing countries are under pressure to select levels of service that are affordable and to provide facilities at minimum cost; computers can assist in meeting these objectives, particularly in network design.

2:15 p.m. Appropriate Pumping and Piping

Octavio Cordon, C.M. Cordon y Merida, lngs., Guatemala City

Piping and pumping are essential elements of community water systems; their proper selection, design, installation and operation are important to the continued operation of systems in development.

3:30 p.m. Break

4:00 p.m. Case Studies in Asia

John D. Knoll, Jr., Vice President, James M. Montgomery, Inc.

A review of water supply projects in Korea, Philippines, Indonesia and Malaysia provides an understanding of the constraints to success and how they can be overcome, from the point of view of the consulting engineer.

4:30 p.m. Case Studies in Latin America

Guillermo Yepes, Deputy Division Chief, Latin America Water Supply and Sewerage Division, World Bank

Progress of water supply projects in Mexico, Colombia and Peru, among other Latin American countries, as seen by engineers serving the World Bank.

5:00 p.m. Simultaneous Group Sessions

- A. Rural Water Supply - Craig Hafner, WASH
- B. Community Water Supply - David Donaldson, Pan American Health Organization
- C. Urban Water Supply - Lao St. Michel, WASH

Roundtable discussions of the special problems facing these responsible for rural, small community, and large urban water supply projects.

5:45 p.m. Adjourn

7:30 p.m. Simultaneous Evening Seminars

- I. Handpump Roundtable
F.E. McJunkin, AID
Andrew Karp, Handpumps Project Officer, World Bank
James Bell, Water and Sanitation Sector Specialist, U.S. Peace Corps

Brief presentations and extensive discussions concerning the role of handpumps in rural water supply programs, problems with their manufacture, reliability and maintenance and the institutional responsibility for their operation.

- II. Microcomputers In Community Water Supply Projects
Donald T. Lauria, University of North Carolina
Octavio Cordon, Consulting Engineer, Guatemala

Several programs have been developed for microcomputers to assist in the design of community water systems; some of these will be described, demonstrated and discussed.

Saturday, June 29

8:30 a.m. Groundwater Development

Ralph E. Preble, Jr., Associate-Project Management, Camp Dresser & McKee International Inc.

Groundwater is the source of choice for most small rural and community water systems; approaches to identifying sources, well drilling, well and pump design and operation are presented.

9:15 a.m. Appropriate Technology for Water Treatment

Jorge Arboleda V., Hidrosan Ltda., Bogota, Colombia

Water treatment in developing countries has suffered from inappropriate use of designs developed for industrialized countries, where technical services, spare parts and qualified operators and managers can supervise the facilities; simple low-cost treatment systems are described, appropriate to situations where support services and local manufacture of equipment are limited.

10:15 a.m. Discussion

Daniel A. Okun, University of North Carolina

10:45 a.m. Break

11:15 a.m. Charging for Water Service

Harris F. Seldel, Director, Water and Pollution Control, Ames, Iowa

The viability of water supply projects depends upon an adequate continuous source of funds for operation and maintenance, extension of the system, and replacement of facilities as they wear out; various methods of charging and local financing are presented.

12:15 p.m. Lunch - Richard Miller, President, American Water Works Association

AWWA Activities Relating to International Affairs

This workshop immediately follows AWWA's Annual Conference which will feature events of special interest to those concerned with water supply for communities in developing countries. The schedule for these events, all of which take place at the conference at the Sheraton Washington Hotel, is as follows:

Sunday, June 23
10:00 a.m. to 2:00 p.m.: Framework for Investment in Water Supply Projects in Developing Countries (World Bank)
Noon to 5:00 p.m.: Meet and greet in Exhibit Hall
7:00 p.m. to 8:30 p.m.: International Visitors Welcome Reception

Monday, June 24
9:30 a.m. to 11:30 a.m.: Opening Session

Tuesday, June 25
2:00 p.m. to 5:00 p.m.: International Affairs Forum I, Operation and Maintenance of Water Systems in Developing Countries

Wednesday, June 26
9:00 a.m. to noon: International Affairs Forum II, Rehabilitation of Systems and Organizations

6:00 p.m.: Reception
7:00 p.m.: Banquet

Thursday, June 27
Time to be announced: Field trip to small water supply facilities in Washington Area, conducted by Washington Suburban Sanitary Commission

For information concerning these AWWA functions, write to Mr. Kurt Keeley, AWWA, 6556 W. Quincy Avenue, Denver, CO 80235 or phone (303) 794-7711.

1:30 p.m. Human Resources Development for the Water Sector

John Austin, Environmental Engineer, Office of Health, Bureau for Science and Technology, AID

The lead time required to prepare personnel to serve the water sector in planning, design, construction and operation is generally longer than for the projects themselves; approaches to assessing and meeting the needs for qualified personnel are presented.

2:00 p.m. Case Study in the Middle East

Fritz Rodriguez, Senior Sanitary Engineer, Europe, Middle East and North Africa Department, World Bank

A review of the special problems of water supply in the arid countries of the Middle East and North Africa are presented, with special attention to the successful program in Tunisia.

2:30 p.m. Case Study in Africa

Dennis Warner, WASH Deputy Project Director

Factors that made the Malawi water supply program successful are described, with emphasis on the role of community participation.

3:00 p.m. Simultaneous Group Sessions - continued.

- A. Rural Water Supply - Fred Rosensweig, WASH
- B. Community Water, Supply - Jorge Arboleda V.
- C. Urban Water Supply - Octavio Cordon

3:45 p.m. Summary of Principles, Constraints and Approaches to Successful Water Supply Projects

Harold R. Shipman, Consultant, Chevy Chase, Maryland

The distinguished former World Bank and World Health Organization engineer summarizes the findings of the workshop and helps identify efforts required for the second half of the International Drinking Water Supply and Sanitation Decade.

The Water and Sanitation for Health Project has been in operation since September 1980. WASH is managed by Camp Dresser & McKee International Inc. in conjunction with Associates in Rural Development, Inc., International Science and Technology Institute, Inc., Research Triangle Institute, Training Resources Group, and the University of North Carolina, through a contract with the United States Agency for International Development.

WASH provides services to USAID missions initiated through requests by AID field projects, host country institutions, private voluntary agencies, and multi-lateral agencies. To date, WASH services have extended to over 50 countries.

ANNEX 2
Final Workshop Program

PLANNING AND DESIGN FOR COMMUNITY WATER SUPPLY

Program

Friday, June 28

AM

- 8:30 Registration
- 9:00 Welcome Dennis Warner, WASH Project
- 9:15 Water and Health F.E. McJunkin, AID
- 9:45 Community Water Supply Planning Issues Daniel A. Okun, University of North Carolina
- 10:30 Break
- 11:00 U.S. AID Procurement Policy in the Water Sector Rod MacDonald, AID
- 11:30 Discussion

PM

- 12:15 Lunch Martin Beyer, UNICEF
- 1:30 Water Distribution Options and Designs Donald T. Lauria, University of North Carolina
- 2:15 Appropriate Pumping and Piping Octavio Cordon, Cordon y Merida, Ings., Guatemala
- 3:30 Break
- 4:00 Case Study: Asia John D. Knoll, Jr.
James M. Montgomery, Inc.
- 5:00 Simultaneous Group Sessions
1. Rural Water Supply Craig Hafner, WASH
2. Community Water Supply David Donaldson, Pan American Health Organization
3. Urban Water Supply Paul Dreyer, Camp Dresser and McKee
- 5:45 Adjourn

Friday, June 28 (Continued)

PM

- 7:30 Simultaneous Evening Seminars
1. Handpump F.E. McJunkin, AID
Andrew Karp, World Bank
James Bell, Peace Corps

2. Microcomputers in Community
Water Supply Projects

Donald Lauria, University of North
Carolina
Octavio Cordon, Cordon y Merida,
Ings.

Saturday, June 29

AM

- 8:30 Groundwater Development Ralph Preble, Camp Dresser and McKee
- 9:15 Appropriate Technology for Water Treatment Jorge Arboleda V., Hidrosan Ltda.,
Bogota, Colombia
- 10:15 Discussion
- 10:45 Break
- 11:15 Charging for Water Service Harris Seidel, Water and Pollution
Control, Ames, Iowa

PM

- 12:15 Lunch Richard Miller, American Water Works
Association
- 1:30 Human Resources Development John Austin, AID
- 2:00 Case Study: Latin America Guillermo Yepes, World Bank
- 2:30 Case Study: Africa Dennis Warner, WASH
- 3:00 Simultaneous Group Sessions
1. Rural Water Supply Fred Rosensweig, WASH
2. Community Water Supply Jorge Arboleda V., Hidrosan Ltda.
3. Urban Water Supply Octavio Cordon, Cordon y Merida,
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- 3:45 Summary of Principles, Constraints, and Approaches to Successful Water Supply Projects Hans Van Damme, International
Reference Center for Community Water
Supply, The Hague
- 4:00 Adjourn

ANNEX 3
List of Participants

AID/WASH Workshop on Planning and Design for
Community Water Supply in Developing Countries

Arlington, Virginia
June 28-29, 1985

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ANNEX 4

Workbook Table of Contents

Previous Page Blank

GOALS/PROGRAM	
WATER AND HEALTH	1
<hr/>	
COMMUNITY WATER SUPPLY PLANNING ISSUES	2
<hr/>	
AID PROCUREMENT POLICY	3
<hr/>	
WATER DISTRIBUTION OPTIONS AND DESIGN	4
<hr/>	
APPROPRIATE PUMPING AND PIPING	5
<hr/>	
GROUNDWATER DEVELOPMENT	6
<hr/>	
APPROPRIATE TECHNOLOGY FOR WATER TREATMENT	7
<hr/>	
CHARGING FOR WATER SERVICES	8
<hr/>	
HUMAN RESOURCES DEVELOPMENT	9
<hr/>	
CASE STUDIES	
LUNCHEON SPEAKERS	10

ANNEX 5

Workshop Evaluation Form

3. Present a series of case studies that will demonstrate how different regions have approached the problems of community water supply.

objective	1	2	3	4	5	objective met
not met			.			very successfully

Comments:

4. Provide written information to the participants that reinforces the presentations.

objective	1	2	3	4	5	objective met
not met						very successfully

Comments:

B. Individual Sessions

Please check the three presentations which were the most valuable to you.

- Water and Health, F.E. McJunkin
- Community Water Supply Planning Issues, Daniel Okun
- U.S. AID Procurement Policy, Rod MacDonald
- Water Distribution Options and Designs, Donald Lauria
- Appropriate Pumping and Piping, Octavio Cordon
- Groundwater Development, Ralph Preble
- Appropriate technology for Water Treatment, Jorge Arboleda
- Charging for Water Services, Harris Seidel
- Human Resources Development, John Austin
- Handpump Seminar (Optional)
- Microcomputer Seminar (Optional)
- Asia Case Study, John Knoll
- Latin America Case Study, Guillermo Yepes
- Africa Case Study, Dennis Warner
- Middle East Case Study, Daniel Coyaud

C. Methods

Which of the workshop methods used were helpful to your learning?

Not Helpful	Moderately Helpful	Most Helpful
1-----	2-----	3-----4-----5

1) Lecture				
2) Full Group Discussions				
3) Simultaneous Group Sessions				
4) Case Studies				
5) Optional Seminars				

Comments:

D. Workshop Notebook

How do you evaluate the notebook used in this conference?

Not useful	1	2	3	4	5	very useful
------------	---	---	---	---	---	-------------

Comments:

E. Other Issues

1. Will you be able to use the ideas presented during this workshop in your current job?

Little ability to apply	Will be able to apply to some extent	High ability to apply
1	2	3
		4
		5

Comments:

2. How relevant to your work were the issues and problems discussed?

Not Relevant		Moderately Relevant		Very Relevant
1	2	3	4	5

Comments:

3. What is one major thing you plan to do differently/better as a direct result of this conference?

4. What do you think about the format of the conference?

5. If your native language is not English would translation have helped?

not at all		somewhat		very much
1	2	3	4	5

6. If you took the AWWA field trip to the Leesburg Water Treatment Plant, should trips like that be part of future seminars such as this one?

F. Facilities

Please indicate your satisfaction with the following support arrangements.

	Not At All Satisfied		Moderately Satisfied		Very Satisfied
1. Conference Facilities	1	2	3	4	5
2. Lunches	1	2	3	4	5

Comments:

G. Finally

1. If we repeated this seminar on this subject, do you have any other recommendations for improving it?

2. What other subjects would you be interested in for future seminars?

ANNEX 6
Summary of Workshop

Summary of Workshop

Edited from a summary prepared by Hans Van Damme

If a B-747 crashed every half hour, fewer people would be killed annually than the number¹ of children who die because of a lack of water and sanitation facilities.

GENERAL

1. Developments over the last ten years, including the Water Decade and its preparation, have helped problem definition and have contributed to new thinking and new approaches to the sector.
2. One fundamental issue which has received increasing emphasis is the importance of water and sanitation for rural communities. Another is that the success of water supply interventions is not so much measured by the number of taps and pumps, but rather by the ability of people to establish, maintain, and effectively use them.
3. The issue of maintenance, closely linked with the issues of appropriate technology and community involvement and that of revenues for recurrent and replacement costs, have more and more surfaced as stumbling blocks to success.
4. Success cannot be achieved without a meaningful partnership with the people concerned. Such partnerships can no longer consist of token involvement, token participation by women, and token decisions by community representatives. Government and nongovernmental agencies can no longer ask communities to participate in their projects: they need to listen to communities, to understand their needs, and to respond to their priorities. Women in particular must be involved in the various phases of project development and implementation.

HEALTH

5. There can be no doubt that clean and adequate amounts of water are an indispensable prerequisite of good health.
6. In source selection, the highest quality source that is economically and technically feasible should be selected.
7. From a health point of view, an ample quantity of water is required.
8. Improved environmental sanitation, including hygiene education, requires additional priority and resources. A careful balance of these elements, organized with the broader framework of primary health care and community development and, where relevant, also integrated rural development, offers the best chance to improve the quality of rural life.

¹F.E. McJunkin, Water and Human Health, U.S. Agency for International Development. July 1982.

PLANNING

9. For the period of design, approximately ten years may be most appropriate.
10. Vendor systems should be explored as they have potential for providing water until piped systems become feasible.
11. Intermittent systems are hazardous to health and should be avoided where feasible. Maintenance of pressure 24 hours per day is essential to the integrity of a system.

WATER SUPPLY FOR RURAL COMMUNITIES

12. A recommended priority sequence for rural water supply systems is (i) gravity systems, (ii) groundwater with hand-dug well and bucket and rope or handpump. In the case of handpumps, the best available pump should be used.
13. Photovoltaic pumps have increasing potential for use in small community water supply systems.
14. Disinfection must be coupled with user education if it is to be effective.
15. In rural water supply projects, ample attention must be given to sound institutions that have the ability to provide spare parts, to employ and train people, and to arrange for funding for these and the many other responsibilities that accompany water supplies.
16. Often insufficient management orientation exists in community water supply planning as compared to technical orientation. The infrastructure to operate and maintain the system should in general receive more emphasis than is now the case.

DESIGN

17. A need exists in developing countries to apply efficient and innovative water system designs. That implies the requirement of considering alternatives. Microcomputers can play a useful role. Careful analyses leading to the best possible design can obtain significant cost reductions.
18. Several successful design standards, including those regarding water treatment plants, have been applied in Latin America. Several of these standards are imported ones which have been modified to suit local conditions. Many of these standards are potentially applicable for use in other developing countries also. They must, however, recognize local financial and economic conditions. These standards are worth publicizing widely for additional use in other regions.
19. Techniques for drilling of wells for groundwater use, still one of the basic techniques for water supply in rural areas, have considerably improved over the last few years. Various publications and other information sources on this subject are readily available.

FINANCE

20. Where possible, water supply services should operate on a cost-recovery basis. Planning should be based on continuing financial capability to ensure continuity of operations and the ability to maintain and repair systems. Level of service must be tied to a community's ability and willingness to pay.
21. Terms of water pricing should include raising sufficient revenue, sharing the burden fairly, keeping administration simple and efficient, and influencing consumer behavior.
22. Many open questions remain concerning financing, tariffs and structures, which can be best addressed in each situation separately. A need also exists for more general studies in this area.

INSTITUTIONAL

23. Factors which contribute to successful institutional development include: (i) well-conceived objectives and implementation of them by a committed and strong government; (ii) education of the population; (iii) autonomy in terms of management; and (iv) effective cost recovery.
24. Human resource development involves a whole host of elements of which training is only one. The people involved in the water sector range from the global planner to the young child carrying a jug of water. For each effort, everyone involved must make sure that all people are fully aware of the types and quality of human resources needed and do it in ways to attain the quality and quantity where needed.

CONCLUSION

25. The saying of the computer business "hardware rots, software remains" is equally valid for the community water supply sector.