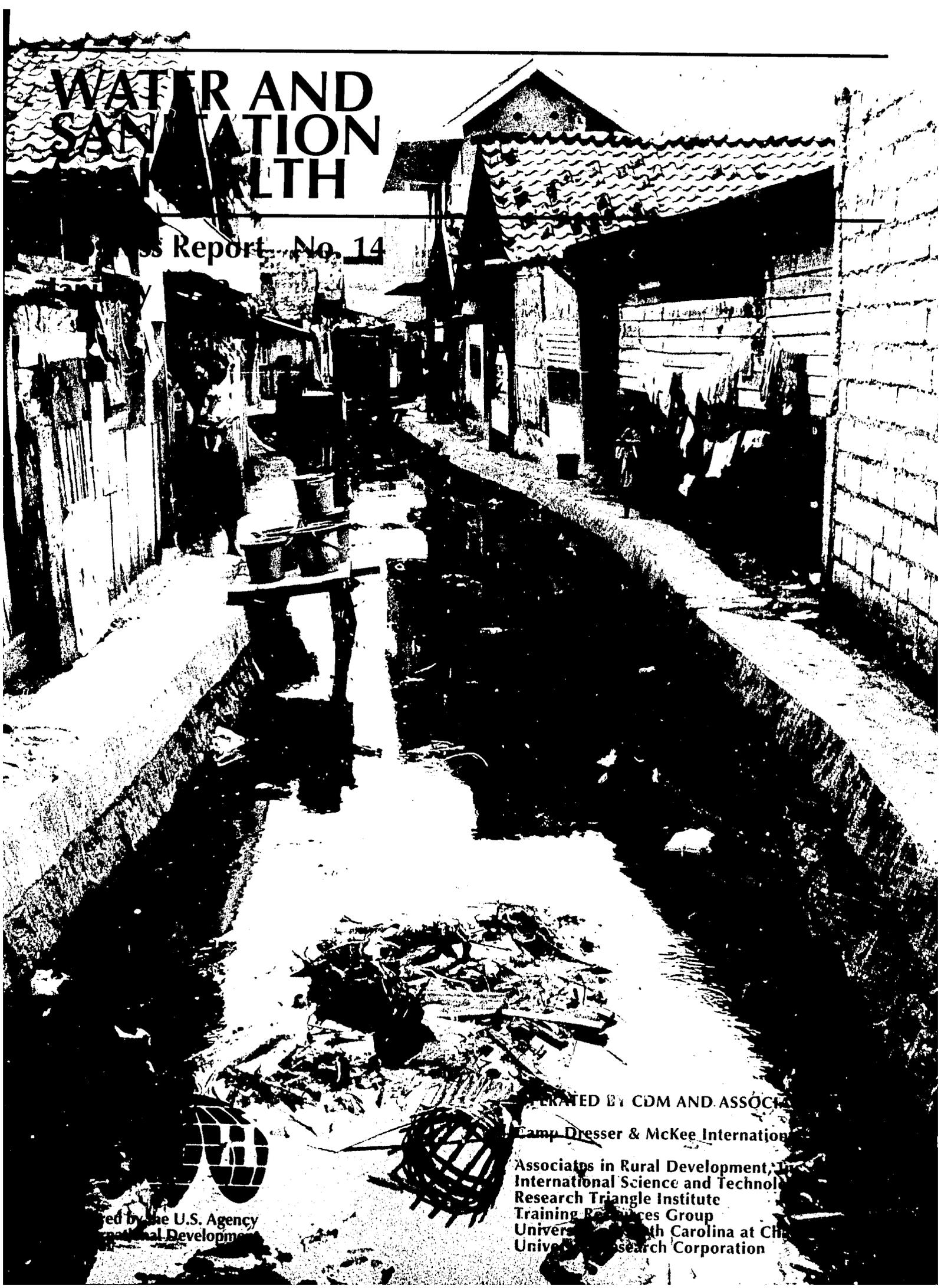


# WATER AND SANITATION FOR RURAL HEALTH

Case Report No. 14



Supported by the U.S. Agency for International Development

OPERATED BY CDM AND ASSOCIATES  
Camp Dresser & McKee International  
Associates in Rural Development, The  
International Science and Technology  
Research Triangle Institute  
Training Resources Group  
University of North Carolina at Chapel Hill  
Research Corporation

# WATER AND SANITATION FOR HEALTH PROJECT

## Progress Report No. 14

January 1992

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Summary of CDM Contract Activities for WASH III  
October 1, 1988, to December 31, 1991  
and  
Cumulative List of WASH I, II, and III Reports

Prepared by Diane B. Bendahmane

Water and Sanitation for Health Project  
Contract No. DPE-5973-Z-00-8081-00, Project No. 836-1249  
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Cover photo: Sean Sprague/Panos Pictures

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## ABBREVIATIONS AND ACRONYMS

ADB—African Development Bank	IRC—International Reference Center for Community Water Supply and Sanitation (The Hague)	REDSO—Regional Economic Development Service Office
ADF—African Development Fund	ISTI—International Science and Technology Institute	RHUDO—Regional Housing Development Office
AFR—Bureau for Africa	LAC—Bureau for Latin America and the Caribbean	ROCAP—Regional Office for Central American Programs
A.I.D.—Agency for International Development	NCIH—National Council for International Health	RTI—Research Triangle Institute
ANE—Bureau for Asia and Near East (now divided into ASIA and NE)	NE—Bureau for Near East	S&T/H—Bureau for Science and Technology, Office of Health (now R&D/Health)
ARD—Associates in Rural Development	NGO—non-governmental organization	TRG—Training Resources Group
ASIA—Bureau for Asia	O&M—operations and maintenance	UNC—University of North Carolina
CARE—Cooperative for American Relief Everywhere	ODA—Overseas Development Administration (U.K.)	UNDP—United Nations Development Program
CDM—Camp Dresser & McKee International Inc.	OFDA—Office of Foreign Disaster Assistance	UNEP—United Nations Environment Program
ENE—Bureau for Europe and Near East (now EUR and NE)	ORT—oral rehydration therapy	UNESCO—United Nations Educational, Scientific, and Cultural Organization
EPA—Environmental Protection Agency	PAHO—Pan American Health Organization	UNICEF—United Nations Children's Fund
EUR—Bureau for Europe	PPC/E—Bureau for Program and Policy Coordination, Office of Evaluation	URC—University Research Corporation
FHA/PVC—Bureau for Food and Humanitarian Assistance, Office of Private and Voluntary Cooperation	PRE—Bureau for Private Enterprise	USAID—United States Agency for International Development
FVA/PVC—Bureau for Food for Peace and Voluntary Assistance, Office of Private and Voluntary Cooperation (now FHA/PVC)	PRICOR—Primary Health Care Operations Research	VBC—Vector Biology and Control Project
GTZ—German Agency for Technical Cooperation	PRITECH—Technology for Primary Health Care	WASH—Water and Sanitation for Health Project
HEALTHCOM—Communications for Child Survival	PROWWESS—Promotion of the Role of Women in Water and Environmental Sanitation Services	WASHED—Water and Sanitation for Health and Ecuadorian Development
HRD—human resource development	PVO—private voluntary organization	WHO—World Health Organization
ICDDR,B—International Center for Diarrheal Disease Research, Bangladesh	R&D/Health—Bureau for Research and Development, Office of Health	
IDRC—International Development Resource Center (Canada)	REACH—Resources for Child Health	

# 1. INTRODUCTION

## COVER STORY

The cover photo for this year's progress report depicts one of the many canals that run through the kampungs of Jakarta. Like other canals, storm sewers, streams, or rivers that flow through urban areas elsewhere, this waterway is choked with rubbish. The solid waste is what we see; what we do not see are the other kinds of pollution that make this water a danger to the community. Sullage and human excreta, as well as commercial and industrial (sometimes toxic) wastes may flow or be dumped into these canals, turning them into open sewers.

The photo reminds us that freshwater is a finite and vulnerable resource, increasingly threatened by over-exploitation and pollution. Many waterways in the world might look something like the Jakarta canal if they were photographed. Because we have neglected or postponed dealing with this problem, it has worsened appreciably and become more complex and more difficult and expensive to solve.

Some examples make the point vividly. Only 14% of the urban population in Africa has sewerage connections. In Latin America, sewerage currently extends to some 40% of the population, but in urban centers about 90% of the sewage collected is emptied untreated into surface waters. In India, where the urban population has more than doubled in the past 20 years, 115 cities discharge municipal wastes, untreated sewage, and industrial wastewater into the Ganges River, making it one of the most polluted rivers in the world. In metropolitan Manila, 600 tons per day of solid wastes are left uncollected on streets or dumped in stormwater drains or other waterways. In Eastern Europe, toxic metals in industrial wastes and from municipal and other discharges find their way into the bottom sediments of the Danube River system and the Black Sea, and potentially into the food chain via commercial fishing. Some Soviet scientists have gone on record asserting that 75% of all illness in the former Soviet Union is related to the use and consumption of polluted water.

Water-related diseases are a major health problem, especially in developing countries and the former Soviet Republics and Soviet Bloc countries of Eastern Europe. Diseases caused by microbiological pollution of water supplies or

transmitted by water-associated vectors, and those related to inadequate sanitation and the absence of clean water, are widespread. In addition to infant diarrhea, a major cause of infant mortality, these include, typhoid and paratyphoid, giardiasis, hepatitis A, amebic dysentery, and others. Only recently has attention been focused on the myriad health problems associated with industrial and agricultural water pollution. Metals, organic chemicals, and radionuclides can cause toxic reactions (such as lead poisoning), cancers, and birth defects.

Since water use per capita is expected to increase significantly in developing countries with high economic or population growth rates, the



Ron Gilling/Panos Pictures

Children play in the Pasig River in Manila, Philippines. The river is used by factories to drain off their wastes.

volume of wastes requiring treatment is expected to present a growing problem that threatens the world's freshwater resources. Past sector investment patterns have concentrated on the provision of water supply without commensurate investments in sanitation and even less in wastewater treatment and solid waste collection and disposal. These neglected areas will have to be accorded some priority.

In 1992, the issue of freshwater resources is at last coming to the fore. In January, an international conference on Water and the Environment was held in Dublin, Ireland, in preparation for the U.N Conference on the Environment and Development (UNCED) in June in Rio de Janeiro, Brazil. These conferences are attempting to forge an action plan for the 21st century aimed at making sustainable development a reality. In such plans water plays a key role, for virtually all environmental issues are linked directly or indirectly to freshwater issues.

The provision of water supply and sanitation in developing countries is not only a vital ingredient of economic and social development but also an important element of environmental protection. However, environmentally sound waste management involves more than the safe disposal of wastes that are generated. It should seek to address the root cause of the problem by attempting to change unsustainable patterns of production and consumption, to reconcile economic development with environmental protection.

The WASH Project is being called on increasingly to assist developing countries to address not only classic water and sanitation problems but also the "newer" problems of solid waste, wastewater, and toxic and industrial wastes. Some recent activities in these and other areas are highlighted in this introduction.

#### HIGHLIGHTS OF RECENT ACTIVITIES

##### Protecting Water Resources

**Danube River Study.** One of the first technical assistance assignments WASH has undertaken in Eastern Europe is taking place in Bulgaria, the Czech and Slovak Federal Republic, Hungary, and Romania, four countries through which the Danube River flows (*Tasks #263 and #271*). The study is being carried out at the request and with the support of the Bureau for Europe. Six consultants are designing a model system for



*Courtesy Joseph Haratani and Donald Hernandez*

Official checks hypochlorite dosing device at the Regional Hospital in Piura, Peru, during the 1991 cholera outbreak.

collecting data on the industrial and municipal discharges into the Danube and identifying the municipal or governmental authorities responsible for regulating these discharges. The model builds on similar work done in the United States for the Environmental Protection Agency and individual states in connection with the Clean Water Act.

The purpose of the data gathering is explained in the name of the project: DEMDESP—Danube Emissions Management Decision Support Project. DEMDESP is being carried out at the request and with the support of the Bureau for Europe. The many tributaries of the Danube are highly polluted; this project is a first step in improving the water quality of the Danube River, which is under heavy pressure from agricultural, industrial, and urban development activities. The ultimate goal of this activity is to clean up the Danube and its tributaries, thereby reducing the pollution of drinking water supplies and

improving the health of the people of Eastern Europe. It will be a long-term effort, for pollution control is in its infancy in these countries.

In addition to its technical complexities, the assignment is institutionally complex as well, given the recent political and economic changes in Eastern Europe.

**Hornad River Management Plan.** In a related activity, WASH has just begun assisting the Bureau for Europe to develop a water quality management plan for the Hornad River Basin in the Czech and Slovak Federal Republic and Hungary (*Task #331*). Like *Task #271*, this activity seeks to protect drinking water supplies from contamination in a highly populated area. The Hornad is one of the Danube's tributaries, and the Danube is one of four rivers that flow into the Black Sea, probably the most polluted inland sea in the world.

**Surface and Groundwater Contamination Assessment.** In El Salvador, WASH conducted an evaluation of the status of surface and groundwater contamination in selected waterways (*Task #265*). The data will be used by the government to develop a national strategy for natural resource management. The consultants found that fecal contamination of surface water and wells in the study area was extremely high but that people mistakenly thought the well-water was of good quality. The situation in El Salvador is not unique. In many countries, surface and groundwater sources are often contaminated, partly because sanitation has been neglected, particularly in rural areas.

**Health Effects of Dams.** In Mali, a team of WASH consultants examined the health effects of dams in the Dogon region (*Task #262*). The water in the dams, though it was meant to be used only for irrigation, not for drinking, is suspected of causing water-related diseases. The consultants identified immediate and long-term remedial actions to address this problem.

**Freshwater Resources Paper.** In June 1992 the U.N. Conference on the Environment and Development will be held, in Rio de Janeiro, Brazil. In January, a preparatory conference on water and development was held in Dublin in anticipation of UNCED. WASH was asked to coordinate the preparation of the U.S. government paper on freshwater resources for the conference (*Task #321*). An interagency task force

comprising the Agency for International Development, the Army Corps of Engineers, the Department of Agriculture, the Environmental Protection Agency, and the Geological Survey drafted the paper, which uses case studies to discuss the basic principles of all facets of the protection of freshwater resources.

### **Sanitation, Wastewater, and Solid Waste Management**

**Peri-Urban Sanitation Issues.** A number of tasks recently initiated by WASH are intended to direct attention to the lack of sanitation in many developing countries. One involves the preparation of an issues paper exploring the extent of sanitation problems and needs in peri-urban areas (*Task #339*). While many large cities have sewer systems and piped water, the peri-urban, informal communities that surround them are without even the most rudimentary systems of excreta disposal. In the crowded conditions that prevail, this presents a great danger to health, especially where cholera is present. The issues paper will provide guidance to A.I.D. project designers and will fill an

### **New from WASH: Technical Notes**

With the publication of "A Primer on Investigating and Reducing Water Loss in Water Systems in Developing Countries," WASH has inaugurated a series of "Technical Notes" specifically designed to provide succinct information on technical topics for Mission and Bureau personnel. They are not intended to be "how-to" manuals, rather they attempt to impart a conceptual understanding of the topic and some of the programmatic issues associated with it. Technical Notes are short (6 to 8 pages), are organized in a user-friendly fashion, and make ample use of illustrations—in other words, they are made to order for people whose desks are already stacked with paper.

The second Technical Note, "A Primer on the Disinfection of Rural Water Supply Systems in Developing Countries," will be available in March 1992. It will be followed by a series of Technical Notes devoted to cholera prevention: Household Water Disinfection and Rapid Behavioral Assessment will be the first two.

Technical Notes may be obtained from WASH Operations Center.

information gap: at present little is understood about the problems of and potential solutions for peri-urban sanitation.

**Options for Managing Wastewater and Solid Waste.** As mentioned above, many developing country cities have sewage systems, but in all too many cases, the wastewater is not treated. Often developing country planners are unaware that there is a range of wastewater technologies available to them and that high tech solutions are not the only option. A recently initiated WASH activity will present guidelines to help developing countries consider the range of practical, affordable options for management of wastewater and solid waste in an environmentally sound manner (*Task #336*).

A framework for assessing the wastewater/solid waste situation in a given country has been developed. The framework considers all instruments that institutions can use to protect their environment from the pollution effects of wastewater and solid waste. Normally technological instruments, i.e., water treatment, reuse, storage, etc., are the only ones seriously considered, but regulatory, institutional, economic, and information/education options are available as well. The framework also looks at a range of potential groups that have an influence on controlling pollution. These include polluters, policymakers, consumers, vendors, land and water managers, educators, and health professionals.

**Update of Latrine Construction Guide.** In 1984, WASH published a guide for training community workers in latrine construction. Since then a great deal has been learned about the dynamics of hygiene behavior and community involvement, and new latrine technologies have been developed. Accordingly, WASH is preparing an update of the guide, which will be available in the summer of 1992 (*Task #337*).

### **Cholera Epidemic**

**Preparedness Assessments.** In providing technical assistance to cholera-affected countries, WASH looks at both short- and long-term interventions for prevention. It is hoped that the compelling presence of cholera, especially in Latin America, will spark new interest in making up for years of neglect of the sanitation sector. In the meantime, many Latin American countries are asking for WASH's help in assessing their options

when cholera strikes: Nicaragua (in collaboration with PRITECH and HEALTHCOM) (*Task #270*), Bolivia (in collaboration with PRITECH) (*Task #329*), and Suriname (with HEALTHCOM) (*Task #341*) are the three most recent requests.

**Assessment Guidelines.** As an aid to consultants who are being sent out to provide assistance on cholera, WASH is preparing a set of guidelines on how to carry out a multidisciplinary assessment—what questions to ask, how to gather information, how to work rapidly and cope with information gaps, how to set priorities, and how to present findings and recommendations as a team (*Task #323*). These guidelines will be ready for field testing in February 1992.

### **RECENT PROACTIVE TASKS**

**Focus on Peri-Urban, or "Informal" Urban, Communities.** In addition to the peri-urban sanitation issues paper described above, WASH is engaged in a study to identify the constraints that prevent formal institutions (municipal governments and national water and sewerage agencies) from providing water and sanitation services to poor families living in the informal urban or peri-urban sector (*Task #338*). Today the fastest growing areas in developing countries are peri-urban. These communities have fallen between the institutional cracks. They must rely on informal processes to meet their needs because formal institutions are often structurally and

### **Capability Statement**

In response to numerous requests for more detailed information about WASH technical assistance, the WASH Project has recently issued a statement describing its capabilities and experience. Three more capability statements are being prepared to supplement this general statement: one on environmental management, another on financial management and cost recovery, and a third on environmental health.

In the capability statement, nine general areas of expertise are listed; each is described with an emphasis on the specific skills available. Sample technical assistance tasks are summarized and general information about the project—how it is structured, how to access its services, what its "philosophy" is—is also provided.

Contact WASH Operations Center for a copy.

legally constrained from intervening in peri-urban communities. Also, most bilateral and multilateral assistance programs are geared to assisting formal institutions and have little experience in dealing with the informal sector. The study will provide ideas and examples of how to create a bridge between formal institutions and the informal sector.

**Environmental Health Problems.** WASH is assessing methods of prioritizing environmental health problems in developing countries (*Task #315*). Environmental health problems are caused or exacerbated by environmental conditions. Subsectors that have an effect on environmental health include water supply and sanitation, wastewater, solid waste, air pollution, hazardous material, occupational health, injury, vector borne disease, and food hygiene. Since WASH has experience in water, sanitation, and waste management, it is collaborating with PRITECH to review methods of assessing and prioritizing environmental risks to health in ways that make sense in the developing-country context.

This task grew out of an earlier effort carried out by WASH at the request of the Bureau for Latin America and the Caribbean (*Task #225*) to develop indicators that can be used to measure progress in improving the health-related environment.

#### SELECTED RECENT MISSION ASSIGNMENTS

**Belize.** A program to strengthen sectoral institutional capacity at all levels got underway in December 1991 (*Task #324*). The program will stress a community-based approach. Its overall goal is to ensure the sustainability of improved water and sanitation activities and control vector-borne diseases.

**Benin.** A three-person team from WASH conducted the final evaluation of the Benin Rural Water Supply Project in September 1991 (*Task #268*). The team consisted of an environmental engineer and health education and finance specialists.

**Guatemala.** WASH and the Quality Assurance Project are developing an approach for identifying indicators for and monitoring behaviors in CARE water supply and sanitation programs in Guatemala to track project progress in increasing the health impact of water and sanitation programs (*Task #334*).

#### Training Guides in Foreign Languages

The WASH training workshop guidelines listed below are available in French and Spanish as well as English. These guides contain step-by-step instructions for conducting the workshops and include all participant handouts.

*A Workshop Design for Latrine Construction.* Technical Report No. 25.

*A Workshop Design for Handpump Installation and Maintenance.* Technical Report No. 26.

*A Workshop Design for Rainwater Roof Catchment Systems.* Technical Report No. 27.

*A Workshop Design for Spring Capping.* Technical Report No. 28.

*A Workshop Design for Well Improvement: Protecting Open Wells.* Technical Report No. 34.

Non-profit development organizations may obtain a master copy of any of these guides on request (the master may be photocopied as needed). Other persons and organizations will be charged a small per-page fee to cover duplication costs. Contact WASH Operations Center for additional information.

**Jamaica.** WASH consultants are carrying out a comprehensive management analysis of the National Water Commission, the parastatal agency responsible for water supply and sanitation throughout the island (*Task #318*).

**Nigeria.** WASH assisted in the planning for a team from the Office of Health that assisted Nigeria to develop a health strategy (*Task #272*).

**Western Samoa.** WASH provided a water and sanitation specialist for a Disaster Assistance Response Team (DART) sent to Western Samoa in December 1991 by the Office of Foreign Disaster Assistance in the wake of Cyclone Valerie (*Task #332*).

**Yemen.** A WASH consultant reviewed the procedures in the operation and maintenance workshops set up by USAID to support rural water projects (*Task #261*).

#### CONFERENCES AND WORKSHOPS

WASH continues to serve as planner and facilitator of many sector conferences:

- WASH planned, organized and facilitated a roundtable discussion of **urban health issues in Africa**, held in Nairobi, December 1991 (*Task #328*).
- WASH participated in the **Fifth International Rainwater Harvesting Conference** in Taiwan, August 1991 (*Task #264*).
- WASH participated in the **Water Supply and Sanitation Collaborative Council Meeting**, in Oslo, Norway, September 1991, and made a presentation on GARNET (see box on WASH networks below.) (*Task #266*).
- WASH prepared and delivered two sessions of the September 1991 Dracunculiasis Operators Research Network (DORN) workshop for researchers involved in **guinea worm surveillance** and prevention in Ouagadougou, Burkina Faso. One session was on hygiene education, the other on qualitative research methods (*Task #269*).
- In November 1991, WASH participated in a seminar on **information management** sponsored by the International Reference Center in The Hague, Netherlands, and a conference sponsored by UNESCO on information related to water and the environment, in Brussels, Belgium (*Task #327*).
- A WASH consultant specializing in waste management participated in an International Seminar on **Waste Processing and Management Technologies** in São Paulo, Brazil, November 1991 (*Task #326*).

#### UPDATE ON "SERIAL" BUY-INS

*Water and Sanitation for Health and Ecuadorian Development (WASHED)*. Through a series of related tasks, WASH is providing ongoing technical assistance to WASHED to strengthen the Ecuadorian Institute of Sanitary Works (IEOS), the institution

### WASH Information Networks and Data Bases

The WASH Information Center operates numerous databases on water and sanitation subspecialties. Through these, the Center provides technical backstopping for WASH tasks and responds to requests for information from persons and organizations active in water supply and sanitation. In addition to its own in-house databases, the Information Center has access to databases maintained by the American Water Works Association, the National Library of Medicine, the Royal Tropical Institute, and others.

**RAINCOLL** is a bibliographic database and specialized literature collection of over 400 documents on rainwater harvesting. WASH also has organized a network of organizations interested in rainwater harvesting. Information on these 620 organizations is kept in the **RAINET** database. In addition to basic data about these organizations, RAINET contains information on which countries the organizations have worked in and the types of projects they have been involved in. In connection with these efforts, WASH publishes a biannual bulletin called "Raindrop."

**PERICOLL** is a bibliographic database and specialized literature collection of approximately 200 documents on peri-urban or urban-fringe issues in developing countries. Like RAINCOLL, it has its complementary database, **PERINET**, which contains information on the current and proposed peri-urban projects of 400 organizations. A peri-urban issues newsletter is in the planning stages.

**RAINRES** is a database on applied research in rainwater harvesting now being developed as a contribution to **GARNET**, the Global Applied Research Network, which WASH has been coordinating since early 1991.

**GWDCOLL** is a bibliographic database and literature collection specializing in guinea worm disease (dracunculiasis) to support the efforts of organizations dedicated to the eradication of guinea worm. The newsletter "Guinea Worm Wrap-up," published by the Centers for Disease Control, is translated into French by WASH and distributed to 200 individuals and organizations in Francophone Africa.

**WASHCOLL** is a bibliographic database and literature collection of over 6,000 documents on water and sanitation in developing countries. This is the basic library of the WASH Information Center. In recent months, an effort has been made to obtain literature focusing on urban and environmental issues in developing countries.



Courtesy Dan Campbell

A faculty member of the Water Resources and Environmental Institute of Khon Kaen University in Thailand inspects a household rainwater catchment jar. WASH coordinates a rainwater harvesting network.

responsible for providing water and sanitation in rural Ecuador. Many of these tasks have involved the training of trainers. Recently WASH designed and conducted an eight-day training-of-trainers workshop for the permanent training unit within IEOS (*Task #267*) and a five-day workshop to help IEOS acquire the skills needed to supervise staff and delegate work under a program of decentralization (*Task #320*).

***The National Shelter Delivery System Program.*** This is another institutional strengthening effort for Ecuador. Technical assistance activities are aimed at helping to strengthen the technical, operating, administrative, and financial systems of municipal agencies responsible for providing water and sewerage to low-income, mostly urban communities. Early this year, WASH will conduct two workshops in succession. In the first, the experience of lending institutions will be incorporated in a manual for preparing and evaluating infrastructure projects in peri-urban areas. In the second workshop, planners in water and wastewater utilities will be introduced to the manual and will be trained in preparing technically and financially feasible project proposals (*Task #319*).

***National Strategy for Water-User Associations.*** In Tunisia, WASH has been engaged in assisting the government in a national effort to institutionalize water-user associations as the way to handle operation and maintenance of rural systems. This series of tasks is now drawing to a close. To finish its work in training and training of trainers, WASH is designing and delivering refresher workshops for engineers and community health workers to reinforce training skills learned earlier (*Task #325*) and is developing a training system that will be part of the national strategy for water-user associations (*Task #335*). Under *Task #333* WASH is preparing a reference manual that sets forth guidelines and procedures for forming water-user associations.

## NEW WASH REPORTS

### Technical Reports

***Guidelines for Cost Management in Water and Sanitation Institutions.*** TR 54. Ronald W. Johnson. Part of the WASH Financial Management Series. A framework for understanding the basis of cost management in the provision of water and sanitation services and the service objectives to which those costs contribute.

***Alternatives for Capital Financing of Water Supply and Sanitation.*** TR 56. James S. McCullough. An analysis of sector financing mechanisms for water and sanitation at the national level and between the public and private sector.

***Cost-of-Illness Methodologies for Water-Related Diseases in Developing Countries.*** TR 75. John E. Paul and Josephine A. Mauskopf. Describes how to compute the direct and indirect costs to a nation of water-related disease. Direct costs include costs of curative and preventive interventions; indirect costs include time lost from productive activities and lost opportunities for investment.

### Field Reports

***Final Evaluation of the Rural Water Systems and Environmental Sanitation Project, Peru.*** FR 294. Joseph Haratani, Anna Kathryn Webb, and Cesar Ruiz Soyer. Also available in Spanish. Evaluation of an A.I.D.-supported



Photo by Emma Rodriguez, copyright 1991

The WASH staff as of December 1991. Left to right, row one: Dorothy T. Bagby, May Yacoob, Valerie Redd, Teresa Sarai, Diane B. Bendahmane, Ann Hirschey, Carol P. Stuart; row two, Fred Rosensweig, Kathleen Finn, Germaine Calloway, Sumana Brahman, J. Ellis Turner, Betsy Reddaway, Judith Kaleh, Jane Walker; row three, Michael G. Blackmon, Craig R. Hafner, Dan Campbell, O. Masseur Bateman, Eduardo A. Perez, Philip W. Roark, and Mel Kira. Not pictured, Suzanne Hall. See page ii.

project to provide potable water systems, latrines, and health education to small (less than 500) rural communities in the sierra and high jungle areas of Peru.

*Lessons Learned from the Experiences of the Kasserine Regional Health Education Team, 1987-1991.* FR 324. Sumana Brahman, Elaine E. Rossi and Members of the Regional Health Education Team. Also available in French. An assessment of the health and hygiene component of the A.I.D.-supported Rural Potable Water Institutions Project.

*Planning for Water and Sanitation Programs in Central America.* FR 334. Michelle Mendez. Water and sanitation coverage figures and funding requirements for

meeting targets for Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

*Reflections on a Long-term Program for the Management and Collection of Solid Waste in the Metropolitan Zone of Port-au-Prince.* FR 337. Philip Roark et al. Also available in French. A proposal for the reorganization of the Haitian Service Métropolitain de Collecte des Résidus Solides and a solid waste management plan for the metropolitan area of Port-au-Prince.

*Guinea Worm Eradication Workshop Report, Cotonou, Benin, 3-6 June 1991.* FR 338. Sarah Fry and Ralph Stone. Also available in French. This Peace Corps-sponsored workshop brought together some of the key partners in

guinea worm eradication to review the current status of national guinea worm eradication programs in Africa and to plan the next year's activities.

***Water and Sanitation Efforts among Displaced Kurdish Civilians.*** FR 339.

Richard H. Swenson and Terrance M. Rahe. Report of the water and sanitation aspects of setting up refugee settlements for Kurdish civilians leaving Iraq in the wake of the Gulf War. Swenson and Rahe were members of an OFDA (Office of Foreign Disaster Assistance) Disaster Assistance Response Team.

***Assistance Technique pour l'Entretien des Systèmes d'Eau à Kasserine, Tunisie: Cinquième Mission.*** FR 340. Alan Malina. Available in French only. An evaluation of the A.I.D.-supported Rural Potable Water Institutions Project in Kasserine with special emphasis on the establishment of water-user associations for operation and maintenance of newly installed water points.

***Water Loss in Rural Water Systems in Developing Countries.*** FR 341. Alan Wyatt. An examination of ways to detect and prevent water loss in small rural water supply systems, those that supply communities of under 1,000. See the box on page 3 for a description of the Technical Note based on this report.

***Project Monitoring Report 1990-91: Water and Sanitation for Health and Ecuadorian Development (WASHED).*** FR 342. Daniel B. Edwards. Also available in Spanish. An evaluation of the first year and a half of a long-term effort to strengthen the Ecuadorian Institute for Sanitary Works, the agency responsible for rural water supply in Ecuador.

***Workshop Report on Multisectoral Planning for the Control of Cholera, Lima, Peru, June 1991.*** FR 343. Joseph Haratani et al. This workshop was organized in response to a WASH assessment of the water supply and sanitation situation in areas of Peru hard-hit by cholera.

***A National Communications Plan to Promote Water Users Associations in Tunisia.*** FR 344. Jamil Simon. Also available in French. The plan uses three main dissemination strategies: posters, brochures, and other graphic materials; videos; and mass media.

***Ghana Rural Water Project Start-up Workshop, World Vision and Hilton Foundation, January 7-10, 1991.*** FR 345. Robert A. Gearheart. The Hilton Foundation has provided \$5 million to fund a World Vision/Ghana rural water supply and sanitation project. The workshop developed common understandings among key World Vision/Ghana field personnel, key officials of the Government of Ghana, and World Vision International program managers.

***Report of the Workshop on Private Sector Participation in Urban Water Supply, Bali, Indonesia, 16-18 May 1991.*** FR 346. (Prepared in collaboration with RTI/Municipal Finance Project.) James Clarkson, James McCullough, and Rashid Thabrani. This workshop, which was organized by WASH staff member Jane Walker, brought together representatives of the main groups involved in accelerating private sector participation in urban water supply to develop an action plan.

***A Progress Report on Establishing Regional Training, O&M and Repair Workshops in the Republic of Yemen.*** FR 347. Jonathan Hodgkin. A.I.D. purchased seven sets of mechanical workshop tools and equipment and 110 pump-operator tool kits for Yemen to set up O&M workshops; this report assesses the progress to date in making the workshops operational.

***Principles of Tariff Design for Water and Wastewater Services.*** FR 348. David Laredo. Part of the WASH Financial Management Series. Tariffs are used primarily to recover costs and achieve financial stability but also for efficient allocation of scarce sector resources, equitable income distribution, and fiscal viability. This report describes the principles to be followed in setting tariffs.

***Training-of-Trainers Seminar in Hygiene Education and Community Participation, Pignon, Haiti, September 9-20, 1991.*** FR 350. Sarah Fry and Richard E. Wall. Report of a workshop for staff members of a Haitian PVO conducting the community organization and education component of an A.I.D.-funded rural water project.

***A Comparison of the Health Effects of Water and Sanitation in Urban and Rural Guatemala.*** FR 352. O. Masee Bateman and Shelley Smith. An analysis of Demographic Health Studies data to learn more about the impact of water and sanitation on health. The study demonstrated the importance of community sanitation.

***Surface and Groundwater Contamination in Selected Watersheds in Southwestern El Salvador.*** FR 354. L. Fernando Requena and Becky A. Myton. Also available in Spanish. No long-term data-gathering studies have been performed in El Salvador with respect to contamination of water, soil, and fauna. This report provides baseline data urgently needed to plan and monitor future programs and actions.

#### **HOW TO USE THIS REPORT**

This Progress Report covers all tasks initiated so far under WASH III, which began October 1, 1988. Previous Progress Reports were cumulative, i.e., they listed all technical assistance assignments for WASH I, II, and III. This year that approach was discontinued because the Progress Reports were becoming too voluminous. Readers who wish to retain a cumulative record of

WASH activities will have to keep their copies of Progress Report No. 13. Together, Progress Reports Nos. 13 and 14 cover all WASH activities since the inception of the project in September 1980. In both reports, technical assistance tasks are indexed by subject so that readers can easily locate the assignment they are looking for or see what WASH has done in certain areas.

As concerns the listing of WASH reports, the Progress Report continues to be cumulative. All WASH Technical and Field Reports are listed and indexed by author and subject. For persons who are interested principally in WASH reports, the reports section of the Progress Report (including the indices) has been issued as a separate publication and is available on request.

Persons interested in WASH planned activities for the current fiscal year should consult the WASH Annual Plan. It reviews the preceding fiscal year activities, describes the planning process, and outlines the tasks planned for the upcoming fiscal year.

In June 1990, WASH began issuing a periodical bulletin called "WASH Update" to provide current information about WASH activities and reports between issues of the Progress Report. This practice will be continued.

To receive copies of the WASH Progress Report or any other publications, contact the WASH Operations Center.

## 2. WASH III TECHNICAL ASSISTANCE TASKS

This chapter contains brief descriptions of all WASH III technical assistance tasks from the beginning of WASH III on October 1, 1988, up to December 31, 1991, listed numerically and roughly chronologically. Each description includes the task number, the initiation date, the status as of December 31, 1991, and the name of the WASH manager. The descriptions include the name of the A.I.D. mission or bureau that initiated the assignment. If a WASH report was prepared as part of the assignment, the report number is given. (The reports themselves are listed in Chapter 3.) A detailed subject index of WASH III tasks may be found on page 73. Information about WASH I and II tasks may be obtained from the WASH Operations Center.

Task #1            October 1988: Completed            Turner

**General Administration** This general administration activity provided overall coordination; professional, secretarial, and clerical support; administrative database management; office space and equipment; telecommunications and telephone equipment; document production facilities; mainframe computer usage; and consumable office supplies required to support WASH III in fiscal year 1989. It was continued as Task #101 in fiscal year 1990, Task #201 in fiscal year 1991, and Task #301 in fiscal year 1992.

Task #2            October 1988: Completed            Turner

**General Technical Assistance** General technical assistance included all Washington, D.C., staff activities for WASH III in fiscal year 1989 involving the delivery of technical services or products to A.I.D. which are not specifically authorized under other activities, such as general technical meetings, visitor briefings, routine project correspondence, document review, and other tasks of a technical nature necessary to operate and maintain the Washington office. It was continued as Task #102 in fiscal year 1990, Task #202 in fiscal year 1991, and Task #302 in fiscal year 1992.

Task #3            October 1988: Completed            Turner

**Preliminary Task Development** This task captured all time used by task managers and appropriate subcontractor staff and consultants during WASH III, fiscal year 1989, in preparing the annual plan, task papers, and scopes of work prior to the issuance of an authorized task. It was continued as Task #103 in fiscal year 1990, Task #203 in fiscal year 1991, and Task #303 in fiscal year 1992.

Task #4            October 1988: Completed            Hafner

**Provision of Information Services** This service activity for WASH III, fiscal year 1989, aimed to provide A.I.D. and A.I.D.-assisted organizations with relevant information on all aspects of the water supply, sanitation and environmental health sector, WASH Project activities, and other topics as requested by A.I.D. Activities included managing the library and distribution center, maintaining and acquiring accessions and mailing lists, mailing reports, preparing special reports and synthesis documents, maintaining liaison with U.S. and foreign water supply and sanitation information agencies, briefing visitors, preparing exhibits and briefing packages, and maintaining water supply and sanitation country planning data bases. It was continued as Task #104 in fiscal year 1990, Task #204 in fiscal year 1991, and Task #304 in fiscal year 1992.

Task #5            October 1988: Completed            Hafner

**Africa Bureau: WASH Initiatives** Under this task, a WASH staff person was designated to maintain liaison with the A.I.D. Africa Bureau for WASH III, fiscal year 1989. This involved developing and reinforcing contracts between WASH and the Africa Bureau and missions, identifying Bureau needs in the water supply and sanitation sector, informing Bureau and mission officials of WASH resources, formulating preliminary WASH responses to Bureau and mission needs, and targeting high priority missions where WASH has not provided assistance. It was continued as Task #105 in fiscal year 1990, Task #205 in fiscal year 1991, and Task #305 in fiscal year 1992.

Task #6            October 1988: Completed            Rosensweig

**ANE Bureau: WASH Initiatives** Under this task, a WASH staff person was designated to

maintain liaison with the A.I.D. Asia/Near East Bureau for WASH III, fiscal year 1989. This involved developing and reinforcing contacts between WASH and the Asia/Near East Bureau and missions, identifying Bureau needs in the water supply and sanitation sector, informing Bureau and mission officials of WASH resources, formulating preliminary WASH responses to Bureau and mission needs, and targeting high priority missions where WASH had not provided assistance. It was continued as Task #106 in fiscal year 1990.

Task #7            October 1988: Completed            Burns

**LAC Bureau: WASH Initiatives** Under this task, a WASH staff person was designated to maintain liaison with the A.I.D. Latin America/Caribbean Bureau for WASH III, fiscal year 1989. This involved developing and reinforcing contacts between WASH and the Bureau for Latin America and the Caribbean and its missions, identifying Bureau needs in the water supply and sanitation sector, informing Bureau and mission officials of WASH resources, formulating preliminary WASH responses to Bureau and mission needs, and targeting high priority missions where WASH had not provided assistance. This was continued as Task #107 in fiscal year 1990, Task #207 in fiscal year 1991, and Task #307 in fiscal year 1992.

Task #8            October 1988: Completed            Turner

**WASH Liaison with Non-Regional A.I.D. Bureaus** Under this task, during fiscal year 1989, WASH III continued to develop and reinforce existing contacts with nonregional A.I.D. bureaus, such as PPC, PRE, and FVA/PVC, to keep them informed of WASH operations, to foster WASH involvement at early stages of bureau project development, and to assist in the formulation of requests for WASH services, such as methods of developing field reference guides. This was continued as Task #108 in fiscal year 1990, Task #208 in fiscal year 1991, and Task #310 in fiscal year 1992.

Task #9            October 1988: Completed            Hafner

**Collaboration with Non-A.I.D. Water and Sanitation-Related Organizations** A designated WASH staff person established and maintained working relationships, collaborative efforts, and information exchange with non-A.I.D. water and sanitation sector organizations for

WASH III during fiscal year 1989. Private voluntary, multilateral, bilateral, and private sector organizations were all included. This was continued as Task #109 in fiscal year 1990, Task #209 in fiscal year 1991, and Task #311 in fiscal year 1992.

Task #10            October 1988: Completed            Turner

**WASH Staff Conference Participation** This task represented a basic communications function of the WASH professional staff. Under this task, during fiscal year 1989, WASH III staff attended selected conferences, seminars, and briefings as presenters or participants to foster understanding, collaboration, and information exchange in the water supply and sanitation sector for A.I.D. and WASH. This was continued as Task #110 in fiscal year 1990, Task #210 in 1991, and Task #312 in fiscal year 1992.

Task #11            July 1989: Completed            Turner

**Preliminary Task Development for Bilateral and Non-Bilateral Buy-ins** Under this task the WASH staff carried out all preliminary work and completed all the paperwork for bilateral and non-bilateral buy-ins in fiscal year 1989.

Task #12            October 1988: Completed            Turner

**WASH III Implementation** The WASH III Project obtained nonexpendable equipment, commodities, and office furniture necessary to start up and operate the WASH III Project. Final configurations for automated office setup were designed and implemented. WASH Operations Center staff were trained in the use of computer hardware and software.

Task #13            October 1988: Completed            Hafner

**Project Start-Up Workshop/Annual Plan for FY 1989** The WASH staff started off the WASH III Project with a workshop which was modeled after WASH Technical Report No. 41 (Facilitators Guide for Conducting a Project Start-Up Workshop). The workshop provided an opportunity to build a project team and to develop a strategy for WASH III. All the organizations that make up the project were represented. In addition, this activity included all work required to prepare the FY 1989 annual plan, which was submitted to A.I.D. on January 3, 1989.

Task #14      November 1988: Completed      Yacoob

**Tunisia: Health Education Technical Assistance** At the request of USAID/Tunis, a WASH consultant worked with the health and sanitation education divisions of North Gafsa and Kasserine to review the progress of the ongoing health education program, paying special attention to the training of the extension workers. In addition, the consultant was involved in identifying needs, developing curricula, producing materials and training modules, and training local persons in improved health and sanitation practices related to the provision of potable water. See WASH Field Report No. 255.

Task #15      January 1989: Completed      Roark

**Yemen: O&M Service Facilities** At the request of USAID/Yemen, WASH prepared a strategy and implementation plan for operation and maintenance services in support of rural water projects. In addition, a list of the tools and equipment required for an O&M workshop were compiled. The work was done in cooperation with and under the supervision of the Confederation of Local Councils for Cooperative Development. See WASH Field Report No. 259.

Task #16      December 1988: Completed      Rosensweig

**WHO: HRD Case Studies** The World Health Organization and the Swedish International Development Agency (SIDA) collaborated on a project to prepare a compendium of human resources development case studies with the aim of sharing successful interventions with a broader audience. WASH agreed to write two case studies. The first described the management development program carried out by WASH in Sri Lanka in 1987-88 (see WASH Field Report No. 230) and the second the training-of-trainers effort for SANRU II in Zaire in 1986-87 (see WASH Field Reports Nos. 177, 198, and 216).

Task #17      January 1989: Completed      Yacoob

**Tunisia: Mid-Term Evaluation of Rural Potable Water Institutions Project** USAID/Tunisia requested WASH assistance in conducting a mid-term evaluation of the Rural Potable Water Institutions Project. The evaluation, which was carried out in February 1989 by a five-person team, assessed the extent to which the project's goals and purposes were being met and provided the Government of

Tunisia and the USAID Mission with guidelines for possible changes in the project design. The project is unique in Tunisia because it emphasizes beneficiary involvement in the management and financing of recurrent costs of potable water points. If this project is successful, the government will adopt the model nationally and seek financing from other donors. See WASH Field Report No. 256.

Task #18      January 1989: Completed      Mattson

**Jamaica: National Water Commission Assistance** WASH assisted USAID and the Jamaica National Water Commission in the technical design and institutional requirements for implementation of the RHUDO/Jamaica Shelter and Urban Services Program. Under this program, a number of water and sanitation projects of critical need have been identified: revolving funds to enhance the affordability of household water and sewer connections, off-site infrastructure development, leak detection and system maintenance, construction of communal water supply systems on a cost-recoverable basis, and minor water supply systems extension.

Task #19      January 1989: Completed      Mattson

**ANE Natural Resource Issue Papers** WASH assisted the Asia/Near East Bureau with the production of the Asia/Near East Natural Resource Issue Papers by writing two of the papers and providing input for others. One of the papers was on rural water supply and environmental issues and the other on the environmental aspects of rapid urbanization and industrial growth. The purpose of the papers is to assist the Bureau to redefine its natural resources strategy to achieve maximum advantage with available funds. See WASH Field Reports Nos. 282 and 283.

Task #20      January 1989: Completed      Rosensweig

**Morocco: Review of the Terms of Reference for Sewage Master Plan** At the request of RHUDO/Morocco, WASH assisted in a review and analysis of the draft terms of reference for the Master Plan for Sewerage for the Municipality of Tetouan. The sanitary engineer designated by WASH for this assignment worked with the USAID Regional Housing Project Advisor and Environmental Officer, the engineering staff of the Municipality of Tetouan, a representative from the Ministry of Interior, and the engineering

staff of the Tetouan Regional Public Utility Authority. The engineer determined whether the draft included sufficient information to permit an environmental impact assessment. He also assured the technical accuracy of the draft, verified that its format and presentation were appropriate for U.S. and Moroccan engineering consulting firms, and evaluated the human and material resources to be provided by the Municipality of Tetouan. See WASH Field Report No. 265.

Task #21      January 1989: Completed      Yacoob

**Haiti: Assessment of CARE Water User Education Program** WASH assisted USAID/Haiti by providing the technical assistance required to assess the USAID/CARE Community Water Systems Development Project. When this project was evaluated at mid-term, it was recommended that the user education program be expanded. Thus, the intent of this task was to make recommendations for improvements of user education activities. See WASH Field Report No. 258.

Task #22      January 1989: Completed      Hafner

**Participation in Decade Working Group for Communication of Information** WASH was asked by the IRC, on behalf of the Water Supply and Sanitation Decade Collaborative Council, to participate in a Temporary Working Group on the Communication of Information. The working group met twice, starting in February 1989 in Geneva. The group discussed four areas: public information/promotion, project/sector information, management information systems at the country level, and the exchange of technical information. At the end of the meetings, the group developed an action plan for submission to the 1990 Committee by April 30, 1989.

Task #23      January 1989: Completed      Rosensweig

**Ecuador: Housing Financial and Institutional Assessments** USAID/Ecuador and RHUDO/SA developed a supplemental program to an existing Housing Guaranty Program in Ecuador called the National Shelter Delivery System Program. An important aspect of this program is residential water and sanitation upgrading. To carry out this part of the program, A.I.D. requested WASH assistance in providing a more complete picture of the institutional and financial capabilities of municipalities to

undertake sound cost recovery practices as well as the capabilities of the technical and financial service organizations to support the municipalities when necessary. The outcome was a technical assistance plan for the water and sanitation part of the supplemental program.

Task #24      January 1989: Ongoing      Sarai

**WHO Collaboration in O&M** WASH participated in an informal working group of external agencies on operation and maintenance sponsored by the World Health Organization. WASH was responsible for preparing the terms of reference for operation and maintenance, elaborating project proposals and a work plan for joint cooperation, and revising guidance materials for case studies. Working group meetings were held in November 1988 and February 1989; follow-up collaborative activities took place from February to September 1989. As a result of these meetings an ongoing operation and maintenance collaboration has been established.

Task #25      January 1989: Completed      Rosensweig

**World Bank: Concept Paper on Community Management** At the request of S&T/H, WASH prepared a concept paper on community management in collaboration with the UNDP/World Bank Program on Water and Sanitation. The paper defined community management, identified the important issues, and set out a research agenda for the Program and WASH. See WASH Technical Report No. 67.

Task #26      January 1989: Completed      Hafner

**Temporary Working Group on Applied Research** In November 1988, the International Consultation on Water Supply and Sanitation Programs recommended the establishment of the 1990 Committee Temporary Working Group on Applied Research. The Working Group was formalized in a meeting in Paris in December 1988 with a core group consisting of USAID/WASH, IDRC, and the UNDP/World Bank Program. USAID/WASH was selected as the lead agency or secretariat. In this role, USAID/WASH coordinated the activities of the working group, whose mandate was to identify gaps and develop a research priority list with emphasis on practical goals for project planners and managers. A joint WASH-UNDP/World Bank Report was submitted to the 1990 Committee on April 30, 1989. See WASH Field Report No. 281.

Task #27      February 1989: Completed      Rosensweig

**Institutional Framework for Rural Water Supply and Sanitation** At the request of S&T/H, WASH developed guidelines to determine the optimum division of institutional responsibilities for rural water supply. The institutional arrangements for the delivery of rural water and sanitation have been a recurring problem. The crux of the problem is that most existing institutional structures are overly centralized. This over-reliance on centralized structures has often resulted in projects that fail to involve the community and thus are not sustained after the systems are constructed. The guidelines present a range of successful institutional models.

Task #28      March 1989: Completed      Mattson

**Bangladesh: World Bank Mission** In March 1989 at the request of A.I.D.'s Bureau for Asia and Near East, a WASH consultant assisted the World Bank mission to Bangladesh to develop the components of a proposed National Municipal Development Project, a water-wastewater project. The proposed project aims to support economic development and human welfare, to strengthen the capacity of municipalities to plan, operate, and maintain their services, and to assist central institutions to support the government's decentralization plans. The WASH consultant concentrated on institutional development, engineering, and operation and maintenance, with an emphasis on sanitation and water quality issues and the use of appropriate technology.

Task #29      March 1989: Completed      Bendahmane

**Progress Report No. 12** The 12th edition of the Progress Report covered all activities and reports through February 1989. The task of putting this report out included preparing descriptions of all activities, writing an overall introduction giving the highlights of the year, adding to the list of reports, and creating a new comprehensive index. In addition, the design of the cover was changed. The Progress Report serves as a cumulative record of WASH activities.

Task #30      March 1989: Completed      Burns

**Ecuador: Evaluation of A.I.D. Rural Water Supply and Sanitation Project.** At the request of the USAID Mission to Ecuador, a team of WASH consultants evaluated A.I.D.'s rural

**Water and Sanitation Project**—a \$10 million effort that has been ongoing since 1981. The purpose of the evaluation was to review the project's experience with water supply and sanitation assistance and to make recommendations that could be used in the design of a new five-year project which the mission had scheduled for fiscal year 1989. Areas of concentration for the evaluation were as follows: community-level operation and maintenance, training, the use of appropriate technology, linkages with child survival activities, health impact in general, and the role of women. See WASH Field Report No. 264

Task #31      March 1989: Ongoing      Roark

**Guidelines for Rehabilitation to Sustain Rural Water Supply Systems** At the request of S&T/Health, WASH is developing guidelines on the feasibility of and the best strategy for the rehabilitation of rural water systems. These guidelines include a data collection checklist for determining why a system is not working, for tracing its operation and maintenance history, and for deciding whether it should be repaired, rehabilitated, or replaced. The guidelines, which are intended for project planners and managers, will focus not just on the technical aspects of rehabilitation but also on the need to guarantee the sustainability of the institutional systems providing support to the physical systems.

Task #32      March 1989: Completed      Rosensweig

**Development of a Training Guide for the Training of Trainers** One of the key elements to a successful rural water supply and sanitation program is training. However, much training is conducted by individuals who know the subject matter but have limited training skills. Over the years, WASH has conducted numerous "training-of-trainers" workshops for these individuals and has therefore accumulated a lot of experience on this subject. At the request of S&T/Health, WASH developed and field-tested a training guide for the training of trainers. This guide focuses on basic training design and delivery skills and is suitable for use by government agencies, private voluntary organizations, international agencies, donor-funded projects, and the Peace Corps. It is similar in format and organization to other training guides prepared by WASH. See WASH Technical Report No. 73.

Task #33      March 1989: Completed      Mattson

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**El Salvador: Rural Water Supply Project Paper** USAID is funding a Public Services Reconstruction Project in El Salvador with a rural water and sanitation component. This project component is expected to include the repair and upgrading of existing water and sewage systems, construction of new systems, well drilling and handpump installation for communities where piped systems are not feasible, community organization for operation and maintenance, small regional water analysis laboratories and repair shops, training of personnel, and technical assistance to the government unit created to manage the project. USAID/El Salvador requested WASH assistance in preparing the Project Paper for this project component.

Task #34      March 1989: Completed      Turner

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**Policy Paper for UN Habitat Commission** WASH assisted A.I.D.'s Office of Housing and Urban Programs to write a policy paper for the 12th Session of the United Nations Habitat Commission in Cartagena, Colombia, (April 24-30, 1989). The paper described A.I.D.'s policy with regard to urban water supply and sanitation with a particular focus on elements that promote the sustainability of water and sanitation infrastructure. Four precepts were developed: 1) Sustainable institutions are those that use and leverage market forces, not try to repel them. 2) Decentralization of responsibility for water supply and sanitation services means placing responsibility at the most appropriate level whether in the public or private sector. 3) The first order of need is to increase access to financial resources both for capital investment and for recurrent costs. 4) Water supply and sanitation agencies must recognize that consumer involvement is critical to improving institutional performance.

Task #35      March 1989: Completed      Turner

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**Relationship between Water Supply and Sanitation and Health: Synthesis of Existing Knowledge** At the request of S&T/Health, a team of WASH consultants prepared a paper synthesizing what is known about the health impacts (on specific water supply and sanitation-related diseases) of improvements in water supply and sanitation. The purpose of the paper is to state the case for placing a high priority on water supply and sanitation because

it is central not only to health specifically but also to development in general. The paper was distributed to government, USAID, and nongovernmental organization program planners and decision-makers. See WASH Technical Report No. 66.

Task #36      March 1989: Completed      Roark

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**Zaire: Operations and Maintenance Study of Water Systems** USAID supports two ongoing rural water projects in Zaire, and in the several years of project implementation, hundreds of new water systems have been installed. To assure that these new systems are being operated and maintained properly, the USAID Mission in Zaire requested that WASH assist the Zairian Service National d'Hydraulique Rural and other local authorities to develop a sustainable program of operation and maintenance for rural water systems. The assignment included three phases: an assessment of operation and maintenance of existing and planned water systems; operational tests of recommendations to improve operation and maintenance; and presentation of the findings to organizations and officials involved in the sector. See WASH Field Report No. 273.

Task #37      April 1989: Completed      Rosensweig

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**Ecuador: Project Identification Document and Project Paper for Rural Water Supply and Sanitation** At the request of the USAID Mission in Ecuador, three WASH consultants assisted in the preparation of a Project Identification Document and Project Paper for a new USAID-supported rural water supply and sanitation project: the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project. This new project, a follow-on from a previous water supply project that was very successful, emphasizes decentralization but focuses more heavily on hygiene education and the strengthening of the Ecuadorian implementing agency with responsibility for the project.

Task #38      April 1989: Completed      Turner

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**Background Paper: Strengthening Linkages between Water Supply and Sanitation and Child Survival** In early 1989, the WASH Project prepared a concept paper on possible links between water and sanitation and child survival programs. Numerous examples of successful field experiences were described. The central theme

of the paper is that water and sanitation, child health, and literacy (through health education) programs are synergistic; implemented in an integrated fashion, they can help the poorest of the poor come closer to their potential and improve their incomes and their ability to contribute more productively to the kind of development that would sustain social advancement. This paper was discussed at a meeting on linkages held in June 1989 (see Task #50).

**Task #39**                      April 1989: Ongoing                      Roark

**Private Sector Water Supply in Peri-Urban Areas** At the request of S&T/Health and in conjunction with the A.I.D. Office of Housing and Bureau of Private Enterprise, the WASH Project is preparing a policy guidance paper on strategies to meet peri-urban problems in water supply. This task will be completed in two phases: the first phase will be an issues-oriented paper comparing public and private sector approaches to the provision of potable water supplies in peri-urban areas. This paper will include a scope of work for the field portion, or the second phase, which will comprise a comparative study of private and public water supply systems side by side in the same city. (Santiago, Guatemala City, Tangiers, Casablanca, and Santa Cruz are likely candidate sites for the field phase.) On the basis of the field study, a strategy will be developed delineating the opportunities for both private and public sector involvement.

**Task #40**                      April 1989: Ongoing                      Yacoob

**Models for Institutionalization of Community Participation Programs** An interdisciplinary team of WASH consultants is preparing a position paper on effective program strategies for institutionalizing a community participation component in an ongoing water and sanitation project. Experience gathered during the U.N. International Drinking Water Supply and Sanitation Decade has confirmed that the sustainability of water and sanitation systems in rural areas depends to a great degree on community participation and effective user education. However, in most countries primary responsibility for most water supply and sanitation projects lies with a central technical/engineering related ministry, while entirely different ministries (health, social affairs, rural development, or women's affairs) are responsible for ensuring that community water

systems are maintained and used properly. The end product of this task will be a set of guidelines on successful models for institutionalizing community participation drawn from a number of case studies. The document builds on WASH experiences of identifying specific institutional activities so that community management can be sustainable.

**Task #41**                      April 1989: Completed                      Rosensweig

**Guidelines for Selecting Long-Term Advisors** One of the critical ingredients in a successful development project is the long-term advisor or consultant. Most donor-funded projects include one or more long-term consultants who work closely with both the government and the donor agency, often serving as a liaison between the two. These consultants are sometimes ineffective because they are not prepared for the training and coaching role involved in transferring skills to their counterparts. At the request of S&T/Health, WASH looked carefully at the role of long-term consultants to see what skills and attitudes are required and then offered practical guidelines on how such consultants can most effectively transfer skills to their counterparts. See WASH Technical Report No. 69.

**Task #42**                      April 1989: Completed                      Rosensweig

**Strategy for Developing a Training Capability** Most water and sanitation institutions accept the importance of training. Whatever the mechanism for providing training, an in-house capability is needed to plan, monitor, and often to carry out the training. The purpose of this task is to prepare a document which defines the role of an in-house training function and suggests a strategy for developing that function. The document may be used by project designers and host country human resources development managers in strengthening or developing the training capability of their institutions. See WASH Technical Report No. 68.

**Task #43**                      April 1989: Completed                      Rosensweig

**Benin: Training-of-Trainers Workshop** In October 1988, WASH assisted in a mid-term evaluation of the Benin Rural Water Supply and Sanitation Project. One of the recommendations of the evaluation was that a training-of-trainers workshop be organized for district agents and supervisors. USAID/Benin requested WASH assistance in conducting this workshop jointly

with Pragma/MCD, the project's long-term technical assistance contractor. The workshop focused on training skills in three main health education areas: potable water, guinea worm prevention, and oral-fecal contamination. WASH has prepared a training-of-trainers guide which served as the basic curriculum for the workshop (WASH Technical Report No. 73). See WASH Field Report No. 266.

Task #44            April 1989: Completed            Yacoob

**ADF: Water Supply and Sanitation Guidelines for Staff and Communities**

Choice of technology for community water supply is extremely important for long-term sustainability. If a community is going to make a good choice, it needs to know the implications of a chosen technology in terms of service, cost, maintenance, management, and impact on health and the environment. At the request of the African Development Foundation, WASH developed guidelines to assist communities to select the most appropriate water and sanitation technologies. These guidelines may be used by local officials, donor organizations, and the communities themselves. See WASH Field Report No. 270.

Task #45            May 1989: Ongoing            Campbell

**Peri-Urban Information Network** In response to the growing concern regarding the poor economic and social conditions that exist in urban and peri-urban areas of developing countries, the WASH Project, at the request of S&T/Health, will establish a databank to centralize existing information about current projects, evaluations, lessons learned, and ongoing research on urban and peri-urban areas. Establishment of this center will provide a resource for future technical assistance in water and sanitation for urban and peri-urban areas.

Task #46            May 1989: Ongoing            Campbell

**Guinea Worm Disease Information Center** Growing interest in the control and eradication of guinea worm disease has been demonstrated in recent years by the development community. Organizations such as the World Health Organization, the U. S. Centers for Disease Control (CDC), UNICEF, and the Global 2000 Project have made statements of commitment to address this problem. To respond to this interest and to meet the need to gather, coordinate, and

disseminate information about the disease to interested individuals and organizations, the WASH Project created the Guinea Worm Disease Information Network. The network maintains a database of information on the disease and on organizations involved in control and eradication activities, participates in guinea worm coordination meetings when appropriate, and translates into French the CDC's publication "Guinea Worm Wrap-Up."

Task #47            May 1989: Completed            Mattson

**El Salvador: Technical Assistance on Peri-Urban Water Supply** The USAID Mission in El Salvador identified four small areas in peri-urban San Salvador where approximately 1,000 persons were without access to clean water and suggested that a well be developed near these areas to provide the needed water. The USAID Mission requested the assistance of a WASH hydrologist to evaluate government proposed water sources for the areas and other options.

Task #48            May 1989: Completed            Rosensweig

**Egypt: Pre-Implementation Workshops for Cairo Water Authority** At the request of USAID/Cairo, WASH conducted a strategic planning workshop for the General Organization for Greater Cairo Water Supply and planned a similar one for the Cairo General Organization for Sanitary Drainage. Before funding institutional development activities for the two organizations, the mission wished to insure that top and middle management effectively participated in the planning process for the new projects. Based on the workshops and on work done previously, the WASH team drafted the terms of reference for the institutional development activities.

Task #49            May 1989: Completed            Campbell

**Enhancement of USAID's Computerized Registry of A.I.D.-Funded Projects** At the request of S&T/Health, WASH created a comprehensive database on USAID water and sanitation projects. WASH modified the structure of the Center for International Health Information database on USAID's health and child survival projects and on projects with specific water supply and sanitation components so that it included data not currently available.

Task #50      May 1989: Completed      Turner

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**Workshop: Strengthening Linkages between Water Supply and Sanitation and Child Survival** In June 1989 WASH held a two-day workshop to discuss how the links between water and sanitation and child survival projects might be strengthened. The workshop focused on the issues raised in the paper on linkages that was written under Task #38. Workshop activities included reviewing the paper and the country experiences of various participants and discussing possible strategies. Participants were from ministries of health, multilateral and bilateral agencies, and private voluntary organizations. See WASH Technical Report No. 65.

Task #51      May 1989: Completed      Roark

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**Mauritius: Prefeasibility Study for Water-Intensive Activities** At the request of USAID/Mauritius, a team of WASH consultants carried out a pre-feasibility study in Mauritius to recommend solutions to the problems of existing water-intensive, high-polluting textile dyeing operations and to evaluate the feasibility of establishing a leather processing industry on the island in light of the pollution concerns. The team consisted of a sanitary engineer and an environmental engineer. See WASH Field Report No. 272.

Task #52      May 1989: Ongoing      Campbell

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**Rainwater Harvesting Information Center** Interest in rainwater roof catchments as a viable option in rural water supply projects has been growing in recent years. To respond to that interest and to make available what WASH has learned from several years of involvement in rainwater roof catchment promotion, information collection, and training, WASH has established a Rainwater Harvesting Information Center. The Center publishes a newsletter, maintains databases on reports and projects dealing with rainwater harvesting, maintains a network of the 500-600 organizations most active in rainwater catchment technology, provides information, and promotes collaboration.

Task #53      May 1989: Completed      Yacoub

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**Collaboration with the Applied Diarrheal Disease Research Center** At the request of S&T/Health, WASH provided collaborative assistance in the water and sanitation supply

area to the Applied Diarrheal Disease Research (ADDR) Project, a centrally funded USAID project established in 1985 and managed by the Harvard Institute of International Development. The project conducts multidisciplinary research on diarrhea management and behavior related to the prevention and treatment of diarrhea, especially of infants and children.

Task #54      June 1989: Completed      Bendahmane

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**Brochure for WASH III** At the request of S&T/Health, WASH prepared a new brochure describing WASH III services and promoting the idea that water supply and sanitation programs are not just beneficial for health but also for economic and social development.

Task #55      June 1989: Completed      Bendahmane

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**Dissemination of Information on WASH** A number of publishing and promotional activities were carried out under this task: upgrading WASH technical and field reports, exchanging ideas with information officers of other A.I.D. centrally funded projects, exploring new ways to disseminate information about WASH activities, producing a new conference display for WASH, etc.

Task #56      June 1989: Completed      Walker

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**Economic Benefits of Improved Water Supply and Sanitation** WASH investigated the economic benefits of community water supply systems in less developed countries and how to quantify the economic benefits of potable water supplies. Research of this type is needed to provide a clearer sense of the magnitude of benefits from potable water systems for economic planning in the sector.

Task #57      June 1989: Completed      Yacoub

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**Tunisia: Consultancy on Water Systems Design** At the request of the USAID Mission in Tunisia, WASH provided an engineer to assist the CTDA (Central Tunisian Development Authority) to improve its water system designs and reduce costs. Specific activities included training the staff in the use of the World Bank's pipe network design software and working with the three agencies to determine ways to reduce the cost of wells, to re-evaluate reservoir design, and to establish procedures for selecting

pump equipment. See WASH Field Reports Nos. 279 and 298.

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Task #58          June 1989: Completed          Turner

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**Field Test of Guidelines for Conducting a Financial Management Assessment** In 1988 WASH prepared a set of guidelines for assessing the financial management of water supply and sanitation facilities in developing countries. The guidelines were intended to assist project planners and evaluators and water systems personnel to evaluate the fiscal and managerial health of water and sanitation utilities. At the same time, another WASH activity was developing a set of performance indicators applicable to various water and sanitation systems for use in cost management. WASH field-tested these guidelines and cost management indicators. USAID/Jakarta, in response to a request from the Ministry of Public Works, was identified as an ideal location for a field application. After the field test was completed, the guidelines were revised and published as WASH Field Report No. 289.

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Task #59          June 1989: Completed          Perez

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**World Vision Collaboration** The goal of this task was to provide ongoing technical and planning support for World Vision's African Water Program staff. In 1987, World Vision received a matching grant from A.I.D.'s FVA/PVC office to support the institutional strengthening of its African Water Program in Ghana, Senegal, Kenya, Ethiopia, and Malawi. Part of A.I.D.'s matching grant funds were set aside for technical assistance through WASH, and WASH provided technical assistance in staff development, project assessment and evaluation, planning, and information.

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Task #60          July 1989: Completed          Perez

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**Variation in Rural Water Demand** Two of the most expensive components of community water systems are the piped distribution network and the elevated storage tank. The distribution network should be designed to meet peak hourly flows. Unfortunately data on peak demands in developing countries are generally not available. To address this problem, WASH conducted a study of variations in rural water demand to learn daily patterns of water use as a function of community characteristics.

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Task #61          July 1989: Completed          Rosensweig

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**Nigeria: Hygiene Education Workshop and Targets of Opportunity** USAID/Nigeria requested WASH assistance in conducting a workshop on hygiene education. The workshop, which was held in August 1989 in Ilorin, aimed to improve the skills of the participants in developing and implementing hygiene education projects at the community level. Participants included staff from the UNICEF rural water supply project, the UNDP/World Bank-funded Rusafiya Project, and the Nigerian Ministry of Health. A training guide on hygiene education prepared under the WASH Project (WASH Technical Report No. 60) was used as the basis for the workshop. This constitutes the second and final field test of the training guide. In addition to the workshop, the task has a second part: to assist USAID/Nigeria in identifying targets of opportunity in water supply and sanitation. See WASH Field Report No. 278.

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Task #62          July 1989: Completed          Mattson

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**Jamaica: Technical Assistance to RHUDO** RHUDO/Jamaica requested WASH assistance to work with the National Water Commission to develop scopes of work, position descriptions, outline contracts, budgets, and suggested means of procurement for eight positions and contracts. A senior water engineer and senior leak detection expert carried out the assignment.

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Task #63          July 1989: Ongoing          Yacoo

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**Factors Affecting Mobilization for Rural Sanitation** Approaches to sanitation in the early years of the International Drinking Water Supply and Sanitation Decade focused on construction of latrines. Hygiene education was developed to encourage people to use latrines. At the request of S&T/Health, WASH prepared a concept paper on hygiene behavior and how it shapes the choice and continued utilization of latrine technologies.

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Task #64          July 1989: Completed          Mattson

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**RHUDO/ROCAP Central American Initiative** In 1986 a RHUDO/ROCAP Central American Shelter and Urban Development Project was authorized. The project was intended as a regional program to finance low-cost housing solutions and basic infrastructure for the urban poor in Costa Rica, El Salvador, Guatemala, and

Honduras. The project was aimed at middle-sized cities and towns and intended to increase private sector financing and construction of housing and infrastructure facilities. WASH's assignment under this task was to assist RHUDO/ROCAP by developing a management plan for the successful execution of the project.

Task #65                      July 1989: Ongoing                      Perez

**Peace Corps: Guinea Worm Project Coordination** In March 1988, during the WHO Regional Guinea Worm Workshop in Ghana, participants discussed the possibility of using Peace Corps services to further Guinea worm eradication efforts. Under this task, WASH provides support to the Peace Corps in the areas of training, technical assistance, information gathering, and management, designed specifically for Guinea worm projects. This task provides for the initial planning and ongoing liaison with the Peace Corps. It will be followed by specific tasks relating to a project start-up workshop, project monitoring workshops, and staff and volunteer training.

Task #66                      July 1989: Ongoing                      Yacoob

**Indicators and Methodologies for Evaluating Community Participation** At the request of S&T/Health, WASH is developing a set of guidelines that will present a range of options for evaluating the success of community participation activities in water and sanitation. The guidelines will present a number of methods, i.e., participatory, qualitative, focus group, etc., and explain when each is optimally appropriate. These guidelines are needed now more than ever because of the importance accorded community participation and the dearth of evaluation methods designed to assess it.

Task #67                      July 1989: Completed                      Mattson

**Ecuador: Environmental Impact Report** For a number of years, USAID/Ecuador, through its Health Office, has supported small, rural water supply projects sponsored by the Ecuadorian Institute of Sanitary Works (IEOS). A new project (Water and Sanitation for Health and Ecuadorian Development, WASHED) is being prepared to continued A.I.D.'s support of the IEOS program. This new project will fund some 400 new systems in eight provinces. A.I.D./Washington determined that an environmental assessment of this project be carried out to assure that the systems will be

environmentally sound. A two-person team of environmental engineers carried out the assignment in August 1989. See WASH Field Report No. 287.

Task #68                      July 1989: Completed                      Yacoob

**Tunisia: Task Planning for the UAG** In August 1989 WASH conducted a Team Planning Workshop for the director and staff of the UAG, a unit within the Central Tunisia Development Authority responsible for rural development and rural water supply and sanitation. The goals of the workshop were to redefine the roles and responsibilities of each member of the UAG, define linkages with other departments, prepare a 1989-90 workplan, explore alternative management approaches, and focus on effective work styles. See WASH Field Reports Nos. 276 and 277.

Task #69                      July 1989: Completed                      Yacoob

**Tunisia: Action Plan for Water-Users Associations** USAID/Tunis requested that WASH assist the Ministry of Agriculture, the Central Tunisian Development Authority, and USAID to develop a strategic plan for the utilization of \$1 million of project funds which are to be reprogrammed to support water-user associations. The plan of action, which developed an approach to rural water supply that relies heavily on beneficiary participation, described in detail the timing, costs, studies and training needed, and the scopes of work for the proposed activities. (See *Water-User Associations National Strategy* in subject index for related tasks.)

Task #70                      July 1989: Ongoing                      Walker

**Guidelines for Financial Planning of Water Supply and Sanitation Institutions** WASH is preparing a set of guidelines on financial planning for water supply and sanitation institutions. These guidelines, which are intended for use by financial officers and administrators in developing countries, will primarily examine factors that affect capital requirements. They will address issues such as capital improvement needs, capital financing requirements, operation and maintenance costs, revenues from existing rates and water charges, and guidelines for the formulation of a financial plan. See also Task #141.

Task #71                      July 1989: Completed                      Perez

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**Technical Material on Water Loss and Leak Detection** The objective of this task was to assemble information on water loss and leak detection methods applicable to small rural piped water supply systems of the type typically supported by USAID. Generally, these systems transmit and distribute the water through plastic pipe with unmetered household connections or community standpipes. While techniques for investigating water loss in metered supplies with metallic pipes are well developed, there was a need to investigate appropriate methods of water loss investigation for smaller, more rudimentary systems. The material gathered was published as the first WASH "Technical Note." A longer version was published as WASH Field Report No. 341.

Task #72                      July 1989: Ongoing                      Walker

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**Alternatives for Capital Financing of Water Supply and Sanitation** At the request of S&T/Health, a WASH consultant will prepare a study of alternative mechanisms for financing the capital costs of new construction and rehabilitation of water supply and sanitation systems in developing countries. The study is timely because many developing country governments are now looking for ways to increase investments in water and sanitation infrastructure while shifting from a heavy reliance on centrally administered loan financing. The study will provide a typology of financing mechanisms, a description of the major alternatives that have been used (mainly by World Bank- and USAID-sponsored projects), assessments of the alternatives, and case examples of their applications. See WASH Technical Report No. 56.

Task #73                      July 1989: Completed                      Mattson

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**LAC Bureau: Water Supply and Sanitation Coverage Planning Documents** In 1986, A.I.D.'s LAC Bureau commissioned WASH to prepare a report providing country-by-country water and sanitation coverage information on Central America. In 1988, the bureau requested an update of the data in a follow-up report. Under this task, WASH produced a third update to the Central American document and two additional reports: one on the Andean countries of Bolivia, Peru, and Ecuador; and one on the Caribbean countries of Jamaica, the Dominican Republic,

Haiti, Barbados, and Grenada. The reports (see WASH Field Reports Nos. 301, 302, and 303), which are similar in format to the Central American report, contain population and coverage data, brief discussions of the water and sanitation programs in the countries, objectives for improving coverage, and estimates of the investment needed to meet the coverage goals. Like the original Central American report, this was a desk-top effort involving no field research. A similar report was completed in 1988 for 20 African countries (WASH Field Reports Nos. 290 and 291).

Task #74                      August 1989: Completed                      Rosensweig

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**PAHO: Meeting for Members of IAC Schools of Sanitary Engineering** The Pan American Health Organization hosted a meeting of sanitary and environmental engineering professors from Latin American/Caribbean countries in August 1988. The goal of the meeting was to promote collaborative efforts between schools of environmental engineering in developing countries and in the U.S. and Canada. At PAHO's request, WASH provided a facilitator for the meeting and other support to ensure that the meeting achieved its goals.

Task #75                      August 1989: Completed                      Bendahmane

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**WASH Update** At the request of S&T/Health, WASH produced a regular bulletin with up-to-date information on WASH activities and reports for distribution to A.I.D. missions and bureaus and to other organizations involved in the field of water and sanitation development projects.

Task #76                      August 1989: Completed                      Rosensweig

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**Benin: Management and Supervision Workshop** At the request of USAID/Benin, WASH conducted a nine-day workshop for approximately 15 provincial and district-level managers/supervisors in basic management and supervisory skills. The participants were all staff of the Benin Rural Water Supply and Sanitation Project, which began in late 1987 and is scheduled to be completed in December 1990. The workshop was designed to improve the ability of participants to plan activities and supervise the 26 district field agents who are responsible for working directly with the village socio-health development committees. See WASH Field Report No. 280.

Task #77 August 1989: Completed Bendahmane

**Lessons Learned: Final Production** This task covered final editing and production of a report on the key findings or lessons learned for water supply and sanitation development during the course of ten years of WASH technical assistance.

Task #78 August 1989: Ongoing Rosensweig

**Upgrading the Team Planning Meeting Guide** Since 1984, WASH has institutionalized the team planning meeting concept. The current guide to team planning is very effective for field-oriented tasks but requires adaptation for tasks involving research and the preparation of guidelines, handbooks, etc. The purpose of this activity is to produce a companion to the team planning guide that would be more suitable for non-field-oriented tasks. The activity includes two workshops to upgrade the skills of the WASH staff in facilitating team planning meetings.

Task #79 August 1989: Completed Mattson

**Oman: Preliminary Groundwater Recharge Investigation** USAID is interested in assisting the Oman Ministry of Agriculture and Fisheries in recharging groundwater for municipal and agricultural use. The concept is to construct recharge dams that will be interconnected by diversion channels to transport surplus flow to groundwater deficit areas. A preliminary study of this scheme has been completed. A new monitoring and evaluation unit within the Directorate General of Irrigation Affairs is planned. USAID/Oman asked the WASH Project to assess the manpower and equipment requirements of the new monitoring unit and to review the preliminary study. See WASH Field Report No. 285.

Task #80 August 1989: Ongoing Sarai

**Ecuador: Coordination Activities for Technical Assistance to RHUDO** USAID/Ecuador and RHUDO will provide assistance to local governments through the National Shelter Delivery System Program. The emphasis will be on improving peripheral low-income settlements, and A.I.D. will finance residential water and sanitation services for these settlements. USAID/Ecuador and RHUDO have requested WASH assistance to increase the financial self-sufficiency of municipal water and

sanitation agencies. Three activities are fundamental: institutional strengthening of the Ecuadorian Development Bank and the Ecuadorian Institute of Sanitary Works, strengthening the technical and financial management capabilities of concerned municipal agencies, and communicating what is learned in the project to other municipalities. (See *National Shelter Delivery System Program* in subject index for related tasks.)

Task #81 August 1989: Completed Rosensweig

**Ecuador: WASH Technical Assistance for Development of WASHED Project** In 1989 USAID/Quito authorized the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project. The mission requested the WASH Project to provide short-term technical assistance in the areas of training, appropriate technology development, operations and maintenance, hygiene education, and management development during the 1989-1993 period. In this task WASH developed scopes of work and job descriptions for WASH technical assistance and a request for proposal for a local contractor. (See *WASHED* in subject index for related tasks.)

Task #82 August 1989: Completed Sarai

**Haiti: Survey of Private Voluntary Organization Capabilities** At the request of USAID/Haiti, WASH undertook an assessment of the capabilities of private voluntary organizations involved in water supply and sanitation and child survival activities in the central highlands of Haiti. WASH also submitted recommendations on how to involve these organizations in a comprehensive program of child survival.

Task #83 August 1989: Completed Walker

**Cost-of-Illnesses Methodology for Water-Related Diseases in Developing Countries** This task developed a methodology for the use of cost-of-illness approaches for projects in developing countries. This approach focuses on potential health benefits from water supply and sanitation interventions and takes into account potential direct cost savings in the form of avoided medical care expenses, as well as potential indirect cost savings in the form of productivity gains in the population that is no longer affected by the disease or illness. In the initial stages of this task, WASH held a

roundtable discussion of experts who have been involved in the development of cost-of-illness methodologies and authorities who have worked on related demographic issues. See WASH Technical Report No. 75.

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Task #84      September 1989: Completed      Yacoub

**Egypt: Relationship between Water Supply and Sanitation and Diarrheal Morbidity** USAID/Cairo and UNICEF/Egypt requested WASH technical assistance in evaluating the impact of the National Control of Diarrheal Diseases Project in order to determine what kind of community-level intervention would be required to reduce diarrhea incidence and severity. The main objective of this consultancy was to develop a research methodology to determine the effectiveness of various water supply systems in combination with sanitation and health education to reduce diarrhea morbidity in rural Egyptian villages.

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Task #85      September 1989: Completed      Rosensweig

**Zaire: Visual Aids Specialist** Since 1981, USAID-financed projects have been installing hundreds of water systems throughout Zaire. Efforts have been made at the project and government levels to promote community responsibility for the operations and maintenance of water systems, but it has become increasingly clear that greater efforts need to be taken to ensure routine monitoring of these systems. USAID/Kinshasa, therefore, requested WASH to provide a specialist in the design of visual training materials for operations and maintenance to be provided to local village development committees, rural water coordinators, and other extension agents.

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Task #86      September 1989: Completed      Perez

**El Salvador: Environmental Impact Assessment** USAID/El Salvador will implement the Public Services Improvement Project over a period of five years. One component of the project will provide support to restore and install water supply and sanitation systems in association with community organization and health education activities in small rural communities. At the request of USAID/El Salvador, WASH determined the environmental impact of the water and sanitation component of the project. See WASH Field Report No. 299.

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Task #87      September 1989: Completed      Mattson

**Peru: Evaluation of Peru Water Systems and Environmental Projects** In September 1980, USAID/Peru authorized the Rural Water Systems and Environmental Sanitation Project, the purpose of which was to improve the basic health and well-being of the rural population of Peru by providing potable water systems, latrines, and health education to approximately 1,000 rural communities. USAID/Peru requested WASH technical assistance to evaluate the project and to make specific recommendations that could be used for the design of a follow-on water and sanitation project. See WASH Field Report No. 294.

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Task #88      September 1989: Completed      Hafner

**Swaziland: Water Supply and Sanitation Sector Planning** This is a follow-on task to complete a report entitled "Development of National Water Supply and Sanitation Planning Capabilities in Swaziland" that was started under WASH II. The objective of the report is to review the current status of water supply and sanitation projects in Swaziland, analyze the planning process for these projects, and summarize the interventions used by WASH for sector planning in Swaziland. See WASH Field Report No. 317.

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Task #89      September 1989: Completed      Rosensweig

**Zaire: Training-of-Trainers Workshop for Operation and Maintenance** At the request of USAID/Kinshasa, WASH conducted a two-week training-of-trainers workshop in operations and maintenance. The fourth in a series of training-of-trainers events, the workshop was for the members of the national training team for water and sanitation. The workshop employed the draft training guide on operations and maintenance prepared by the WASH Project (see Task #131). Following the workshop, a group of participants modified the training guide and used it in workshops for regional staff involved in rural water supply and sanitation. See WASH Field Report No. 293.

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Task #90      September 1989: Completed      Perez

**Technical Materials on Disinfection** At the request of S&T/Health, a WASH consultant assembled information on disinfection applicable to small rural water supply systems of the type typically supported by A.I.D. These systems

generally serve communities ranging in size from 250 to 1,000, rarely exceeding 2,000. A Technical Note on the state of the art for these systems is being prepared.

**Task #91**      September 1989: Completed      Hafner

**Peace Corps: Guinea Worm Programming and Training Materials** In August and September 1989, the Peace Corps and WASH held two planning meetings on the joint Guinea Worm Eradication Program (see Task #65). During those meetings a decision was made to prepare programming and training materials for Peace Corps volunteers that would be presented and reviewed at a project start-up workshop in Togo in early 1990. The purpose of this task was to develop these programming guidelines and training modules for use in training Peace Corps volunteers working in Guinea worm eradication efforts in West Africa. See WASH Field Reports Nos. 320, 321, and 329.

**Task #101**      October 1989: Completed      Turner

**General Administration** See Task #1.

**Task #102**      October 1989: Completed      Turner

**General Technical Assistance** See Task #2.

**Task #103**      October 1989: Completed      Turner

**Annual Plan and Proactive Task Development** See Task #3.

**Task #104**      October 1989: Completed      Hafner

**Provision of Information Services to A.I.D. and A.I.D.-Related Organizations** See Task #4.

**Task #105**      October 1989: Completed      Roark

**Africa Bureau: WASH Initiatives** See Task #5.

**Task #106**      October 1989: Completed      Rosensweig

**Asia/Near East Bureau: WASH Initiatives** See Task #6.

**Task #107**      October 1989: Completed      Mattson

**Latin America/Caribbean Bureau: WASH Initiatives** See Task #7.

**Task #108**      October 1989: Completed      Sarai

**WASH Liaison with Non-Regional A.I.D. Bureaus** See Task #8.

**Task #109**      October 1989: Completed      Campbell

**Collaboration with Non-A.I.D. Water and Sanitation-Related Organizations in the U.S. and Overseas** See Task #9.

**Task #110**      October 1989: Completed      Turner

**WASH Staff Conference Participation** See Task #10.

**Task #111**      October 1989: Completed      Turner

**Task Development for Mission and Bureau Requests** This task provided for time and expenses incurred in the development of scopes of work for tasks generated from mission and bureau requests and buy-ins in fiscal year 1990. It was continued as Task #211 in fiscal year 1991 and Task #313 in fiscal year 1992.

**Task #112**      October 1989: Completed      Rosensweig

**Guidelines for Evaluating Training** This task was a continuation of a WASH II activity. Under that activity, WASH completed a draft of "Guidelines for the Evaluation of HRD Activities in Water and Sanitation Agencies." The guidelines were developed in collaboration with GTZ and IRC. This follow-on activity involved revising and field-testing the guidelines in collaboration with GTZ and making final revisions following the field test. See WASH Technical Report No. 70.

**Task #113**      October 1989: Completed      Rosensweig

**Completion of Training Guide on Hygiene Education** During the last year of WASH II, a training guide on hygiene education was nearly completed. The guide was developed, field-tested in Ecuador in May 1989, and then revised. A second field test was held in Nigeria in August 1989. Final revisions were made based on the results of the Nigeria field test and the document was published as WASH Technical Report No. 60.

**Task #114**      October 1989: Completed      Sarai

**Ecuador: Revision of Norms and Standards** WASH was asked by the RHUDO/SA office in Quito, Ecuador, to undertake a review of the

existing technical water and wastewater standards for urban areas in Ecuador and recommend appropriate planning and engineering criteria for reducing the cost of services. In addition, WASH was asked to assess the ability of the Ecuadorian Institute of Sanitary Works to apply the criteria prior to project funding by the Ecuadorian Development Bank. This is the first of a series of ten activities to be implemented over an 18-month period. (See *National Shelter Delivery System Program* in subject index for related tasks.)

Task #115      October 1989: Completed      Yacoob

**Nigeria: Africare Technical Assistance**  
Africare, through USAID/Nigeria, requested a WASH consultant to assist in solving some severe technical problems with two Africare borehole drilling rigs. Five handpump boreholes had been drilled and two boreholes with submersible pumps were in process. Problems concerned operation of the existing boreholes, obtaining proper components and pumps for the new boreholes, and maintaining and repairing boreholes. The WASH consultants assessed the current status of all boreholes, repaired minor problems, trained community members to conduct routine maintenance, met with communities to develop a plan for resolving major problems, and worked with Africare staff to implement the plan. See WASH Field Report No. 286.

Task #116      October 1989: Completed      Yacoob

**Finalization of Report Entitled "TECH PACK: Steps for Implementing Rural Water Supply and Sanitation Projects"** Under WASH II, a report was started on how to develop a community management approach to integrate community development, health education, and engineering technology in rural water and sanitation projects. Additional work on this report was required. The purpose of this task was to complete the writing of various sections of the report and to print and disseminate it. See WASH Technical Report No. 62.

Task #117      October 1989: Completed      Yacoob

**Tunisia: Socio-Economic Database**  
USAID/Tunisia requested WASH assistance in carrying out a six-week baseline survey among the water-user associations (WUAs) in Kasserine, Tunisia. The WASH consultant assisted in designing a socioeconomic survey which provided

baseline data for the WUAs, training selected WUA members to conduct the survey, analyzing the data, and preparing a baseline report for the project. The database measures progress made in the utilization, management, and health impacts of improved water supply systems. (See *Water-User Associations National Strategy* in subject index for related tasks.)

Task #118      October 1989: Completed      Sarai

**Indonesia: CARE Strategy for Community Management and Hygiene Education** At the request of USAID/Indonesia, WASH assisted CARE/Indonesia in evaluating three of its rural water and sanitation projects: the Water and Sanitation for a Healthier Environmental Setting Project, the Sulawesi Rural Community Development Project, and the Community Self-financing Water Project. Each of these projects includes extensive community participation in the planning and construction of systems. A hygiene education component was also anticipated. The purpose of the WASH evaluation was to review current community participation approaches and assist CARE/Indonesia to make improvements where necessary. Because the health component was a new endeavor, the evaluation was designed to reinforce current plans and identify possible weaknesses before the health component became operational. Existing or potential sites in the provinces of East Java, Sulawesi, and Nusa Tenggara were visited. See WASH Field Report No. 284.

Task #119      October 1989: Completed      Rosensweig

**Ecuador: Pre-Implementation Workshop for WASHED Project** The Water and Sanitation for Health and Ecuadorian Development (WASHED) Project was approved by USAID/Ecuador and the Government of Ecuador in September 1989. USAID/Ecuador requested WASH assistance in conducting a pre-implementation workshop for the WASHED Project. This workshop provided preliminary project orientation for key members of the staff of the Ecuadorian Institute of Sanitary Works (IEOS—the agency responsible for project implementation), reviewed the status of all necessary administrative arrangements, developed preliminary project implementation plans, and reviewed the status of project conditions required of IEOS. (See *WASHED* in

subject index for related tasks.) See WASH Field Report No. 288.

Task #120      October 1989: Completed      Sarai

**Ecuador: Socio-Economic Survey Instrument for Ecuadorian Development Bank** The purpose of this assignment was to provide the Ecuadorian Development Bank and municipal company personnel with techniques for survey sampling and socio-economic data analysis of low-income communities in Ecuador. The RHUDO/SA office of USAID/Ecuador requested WASH assistance for this activity, the second of a series of ten tasks. (See *National Shelter Delivery System Program* in subject index for related tasks.) See WASH Field Report No. 316.

Task #121      October 1989: Completed      Roark

**Review of Guidelines for the Evaluation of Water Supply and Sanitation Projects** During WASH II, a working paper was completed that provided guidelines for evaluating water and sanitation projects. The guidelines were meant to provide a model for WASH teams and other international organizations. The purpose of this task was to review, critique, edit, publish, and distribute the guidelines. See WASH Technical Report No. 64.

Task #122      October 1989: Completed      Hafner

**Peace Corps: Guinea Worm Eradication Project Start-up Workshop** In August and September 1989, the Peace Corps and WASH held two planning meetings on the joint Guinea Worm Eradication Program under Task #65. During those meetings, the decision was made to plan a project start-up workshop for the staff of up to ten Peace Corps countries in West Africa. Peace Corps/Togo hosted the workshop in Lome, Togo, in January 1990. The Office of Training and Program Support of the Peace Corps requested that WASH provide two facilitators to assist in the design and implementation of the workshop. The goal of the workshop was to motivate and support the involvement of the Peace Corps in the international effort to eradicate guinea worm. See WASH Field Report No. 296.

Task #123      October 1989: Completed      Hafner

**Finalization of Aga Khan Report** This task covered the final review, editing, production, and

distribution costs of a report which was developed under WASH II for the Aga Khan Institute and PRICOR. The report outlines a management plan for the water supply, sanitation, and hygiene education components of primary health care delivery in rural and peri-urban areas. Before it was published, the report was reviewed by both WASH and the University Research Corporation. See WASH Field Report No. 275.

Task #124      October 1989: Completed      Turner

**Collaborative Council Meeting** The Collaborative Council for External Support Agencies in the water and sanitation sector was formally established in The Hague, Netherlands, in November 1988. A meeting of the Council was held in November 1989 in the headquarters of the Centre de Formation Internationale à la Gestion des Ressources en Eau (CEFIGRE) in Sophia Antipolis, France. The meeting was hosted by the French government. The objectives of this meeting were to define water and sanitation strategies for developing countries in the 1990s, to review lessons learned from the International Water Decade, and to examine the work program for the Collaborative Council, including preparation for the global meeting hosted by India in September 1990.

Task #125      October 1989: Completed      Walker

**Malawi: WASH Technical Assistance to USAID/Lilongwe** USAID/Lilongwe requested a variety of WASH assistance during fiscal year 1990 as it started up its new Promoting Health Interventions for Child Survival (PHICS) Project. Assistance on four separate activities was requested of WASH including a willingness to pay for maintenance of rural water systems study. The purpose of this activity was to visit Malawi to reach agreement with the Government of Malawi and USAID on the final scope of work for the various activities and to define the roles of each participating agency.

Task #126      November 1989: Completed      Roark

**Haiti: Assessment of Solid Waste Proposal** USAID/Haiti received a proposal for the privatization of garbage collection service in Port-au-Prince. A new garbage company would be created to be partially owned by the Centers for Development and Health, a private organization. The central government would retain a minority share of the business. USAID/Haiti requested

WASH assistance to 1) evaluate the overall feasibility of the privatization of solid waste collection in Port-au-Prince, 2) consider the environmental effects of solid waste disposal and recommend remedial actions if needed, 3) review the financial viability of the project, and 4) review the government of Haiti's policy and regulations affecting privatization efforts and environmental protection. See WASH Field Report No. 292.

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Task #127    November 1989: Completed    Hafner

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**Ghana: World Vision Evaluation** WASH provided a variety of technical assistance to World Vision's Africa Water Program in the areas of staff development, project assessments/evaluations, and planning workshops (see Task #59). Under this task, WASH provided one person to participate in a four-person evaluation team which evaluated a large-scale World Vision water development project in Ghana. The WASH consultant was primarily responsible for operations and maintenance, community participation, and management issues. This was one of several evaluations being conducted in preparation for the review of large-scale development projects by the World Vision International Board in fiscal year 1990.

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Task #128    December 1989: Completed    Sarai

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**Ecuador: Technical Assistance for Design of Cost Recovery for Infrastructure Projects** The RHUDO/SA office of USAID/Ecuador requested WASH assistance for this assignment, which was the third in a series of ten tasks (see *National Shelter Delivery System Program* in subject index for related tasks). The purpose of this assignment was to provide the municipal companies and municipalities in Ecuador with appropriate techniques for implementing an effective investment cost recovery system. These techniques included a special improvements tax, fee restructuring, and other methods that served as the fundamental mechanisms to sustain the continued value of the fund and the financial autonomy of urban water and sanitation service companies. See WASH Field Report No. 316.

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Task #129    November 1989: Ongoing    Yacoob

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**Tunisia: Administration of Technical Assistance** At the request of USAID/Tunisia, WASH will conduct a series of short-term technical assistance activities in Tunisia. These

activities, which are to take place in the program area of the Central Tunisia Development Agency, have three purposes: to develop a model rural community-managed operation and maintenance system, to make site selection for water projects more economical, and to improve the access to potable water for underserved rural populations. The purpose of the present task is to provide general planning, information support, and liaison activities related to the overall management of these activities. (See *Water-User Associations National Strategy* in subject index for related tasks.)

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Task #130    December 1989: Completed    Yacoob

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**Tunisia: Consultancy on Operation and Maintenance Cost** USAID/Tunis requested WASH assistance in providing technical assistance in water system maintenance over an 18-month period. The purpose of this task was to assist the new Water System Maintenance Service in CTDA (Central Tunisian Development Authority) to develop a comprehensive maintenance plan for the Governorate of Kasserine, provide continuing advice and assistance during the first year the plan is implemented, and assist the water-user associations and the Water System Maintenance Service to develop improved procedures for estimating first-level operation and maintenance costs. (See *Water-User Associations National Strategy* in subject index for related tasks.) See WASH Field Report No. 340.

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Task #131    December 1989: Ongoing    Rosensweig

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**Development of Operations and Maintenance Training Guide (Phase III)**

The purpose of this task is to complete the training guide for operations and maintenance which was started during WASH II. The first draft of the training guide was developed in Bolivia as a result of a three-week course on operations and maintenance for supervisors of rural water systems. This draft was later reworked into a two-week course, which was field tested in Zaire in November 1989. The purpose of this task is to incorporate the results of the field test into the training guide, edit, and disseminate the final version. The guide has been reviewed, based on the Zaire field test, but will require an additional field test before it is ready for dissemination.

Task #132    December 1989: Completed    Bendahmane

**Progress Report 13** The WASH Progress Report is a cumulative list, published annually, of WASH activities and reports since the inception of the project. It also contains an introduction highlighting the key events of the year. This task included all aspects of preparing the report from writing the descriptions of the tasks to distributing the finished product.

Task #133    December 1989: Completed    Hafner

**Haiti: Non-Governmental Organization (NGO) Project Planning Meeting**

USAID/Haiti requested WASH assistance in conducting a planning meeting for non-governmental organizations (NGOs) in the Central Plateau region of Haiti. The purpose of the meeting was to discuss how an integrated water supply and sanitation and child survival program could be designed, managed, and implemented by cooperating NGOs. After the meeting the team prepared a planning document for USAID to implement an expanded child survival project. See WASH Field Report No. 297. This was a follow-on visit to Task #82, which was carried out in early October 1989.

Task #134    December 1989: Completed    Rosensweig

**Bolivia: Start-up Workshop for Community and Child Health Project** Under this task, USAID/Bolivia requested WASH to conduct a project start-up workshop for the Community and Child Health Project, an integrated child survival and water and sanitation project. The water and sanitation activities of the new project are a continuation of the USAID-funded Environmental Sanitation Project. See WASH Field Report No. 295.

Task #135    December 1989: Completed    Rosensweig

**Sri Lanka: Management Development Follow-up** USAID/Sri Lanka requested WASH assistance to design and deliver a follow-up management development workshop for the National Water Supply and Drainage Board (NWSDB). Under WASH II, WASH conducted three workshops over an 18-month period for the 30 top managers of the NWSDB. These workshops focused on such topics as collaborative work planning, running effective meetings, performance monitoring and feedback, and developing performance indicators for each work

unit. The NWSDB direction believed that the managers would benefit from a follow-up workshop. The suggested topics for this workshop included conflict resolution and management styles.

Task #136    January 1990: Completed    Turner

**Tunisia: Development of National Action Plan for Water-User Associations** In September 1989, a WASH consultant worked with the Government of Tunisia to lay out the broad guidelines for developing a nationwide strategy for water-user associations (WUAs) (see Task #69). This national strategy must be fully developed so that implementation can begin as soon as possible. USAID/Tunis requested that a three-person team, one each from WASH, ISPAN (Irrigation Support Program for Asia and the Near East), and IDA (Institute of Development Anthropology), develop a detailed plan of action. (See *Water-User Associations National Strategy* in subject index for related tasks.) See WASH Field Report No. 300.

Task #137    January 1990: Ongoing    Roark

**Zaire: Operation and Maintenance Study—Phase II** In February 1989, WASH received a request for assistance from USAID/Zaire to improve operation and maintenance capabilities for rural systems in the country. This three-phase assignment began with an assessment of current O&M procedures and strategies and the formulation of recommendations for more effective practices with a focus on the needs of the two major USAID-funded projects in Zaire (see Task #36). The primary objective of Phase II is to test these recommendations in the field and to provide direct technical assistance to USAID-financed projects. See WASH Field Report No. 308. After the field tests, a revised O&M program for rural systems will be developed. Phase III will involve presentation of the new program to officials involved in the sector.

Task #138    January 1990: Completed    Yacoub

**Tunisia: Health Education and Development of Women's Interest Groups** In the fall of 1989, WASH conducted a team planning workshop for the director and staff of the UAG, a unit within the Central Tunisia Development Authority (CTDA) responsible for the USAID-supported Rural Potable Water

**Institutions Project** (see Task #68). One of the recommendations of the workshop was that women's interest groups be created within the water-user associations to enable women to play a more visible role in the management of water systems. This task, which was a follow-up to the workshop, assisted the UAG to conceptualize how to organize the women's interest groups, to prepare a work plan for carrying out the concept, and to provide guidance and follow-up to CTDA and the Ministry of Health on health and hygiene education activities. (See *Rural Potable Water Institutions Project* in subject index for related tasks). See WASH Field Reports Nos. 307 and 324.

**Task #139**      January 1990: Completed      Hafner

**Malawi: Operation and Maintenance Cost Analysis** USAID/Lilongwe requested WASH assistance to study rural water system operation and maintenance costs for the Ministry of Works in Malawi. The study, which was designed by the Centre for Social Research of the University of Malawi in collaboration with the WASH Project, gathered information on existing O&M costs for each piped water system, carried out a community survey on ability to pay for operation and maintenance, and conducted workshops to develop strategies on how communities can further contribute in cash and in kind to operation and maintenance. The information was provided to the Ministry of Works and the Centre for Social Research as input for a series of project and district-level workshops. See WASH Field Report No. 309.

**Task #140**      January 1990: Completed      Sarai

**Ecuador: Coordination Activities for Technical Assistance to WASHED Project for Year One** At the request of USAID/Ecuador, WASH is providing technical assistance to the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project to transfer skills and develop the capacity of the Ecuadorian Institute of Sanitary Works (IEOS) to provide rural water and sanitation services in several Ecuadorian provinces. A local technical assistance team will serve the project with daily, ongoing assistance, and specialized consultants from WASH will work with the local team in an ongoing mentor/training relationship over the life of the WASHED project, from 1989 to 1992. Under this task WASH provided general planning, management, and coordination for the

first year of the project. (See *WASHED* in the subject index for related tasks.)

**Task #141**      January 1990: Completed      Walker

**Financial Management Guidelines Roll-up** At the request of S&T/Health, WASH completed the editing and production of guidelines on financial management and willingness-to-pay study methodology. The five reports included *Guidelines for Conducting a Financial Management Assessment of Water Authorities* (WASH Technical Report No. 53), *Guidelines for Cost Management in Water and Sanitation Institutions* (WASH Technical Report No. 54), *Guidelines for Conducting Willingness-to-Pay Studies for Improved Water Services in Developing Countries* (WASH Field Report No. 306), *Principles of Tariff Design for Water and Wastewater Services* (WASH Field Report No. 348), and *Strategy for Planning Peri-urban Water Systems* (WASH Field Report No. 310).

**Task #142**      February 1990: Completed      Hafner

**WHO Paper: The Water Decade and Its Impact on Diarrheal Diseases** At the request of S&T/Health, the WASH Project prepared a background paper reviewing the impact of the International Drinking Water Supply and Sanitation Decade (1981-1990) on diarrheal diseases. A summary of this paper was incorporated into the Decade Assessment Report to the United Nations General Assembly in 1990.

**Task #143**      January 1990: Completed      Roark

**Oman: Water Resources Development—Planning and Scheduling of Technical Assistance** The newly formed Omani Ministry of Water Resources, charged with developing a program of surface water and groundwater monitoring and management, requested the Omani-American Joint Commission to assist with its implementation. At the request of USAID/Oman and the Joint Commission, WASH provided technical assistance to the commission via a series of tasks as it developed plans to cope with the declining groundwater levels and saltwater intrusion in aquifers (see *Oman Water Resources Project* in subject index for related tasks). This, the first task in the series, involved developing an overall plan and schedule for the technical assistance.

**Task #141**      February 1990: Completed      Walker

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**WHO: Preparation of Financial Manual** At the request of S&T/Health, WASH provided a facilitator for a team planning meeting in February 1990 for a six-person team of writers and editors working under the auspices of the World Health Organization to outline the basic contents of a manual on cost recovery in community water supply and sanitation. The manual will incorporate guidelines developed by WHO since 1987 in a series of international consultations on applying cost recovery principles to water and sanitation projects.

**Task #145**      February 1990: Completed      Rosensweig

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**Bolivia: Final CARE Evaluation** USAID/Bolivia requested WASH assistance in conducting the final evaluation of the CAR Child Survival and Rural Sanitation Project, a \$5 million A.I.D.- supported project integrating child survival and water and sanitation. The evaluation provided recommendations for improvements in design and operations for a possible follow-on project. See WASH Field Report No. 312.

**Task #146**      March 1990: Completed      Sarai

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**Ecuador: Development of Project Evaluation Methodology for Ecuadorian Development Bank** This task is one of a series of technical assistance assignments for the RHUDO office of USAID/Ecuador aimed at providing technical assistance to the Ecuadorian Development Bank and the National Institute of Sanitary Works in carrying out the National Shelter Delivery System Program. The goal is to strengthen the two institutions so that they are better able to advise municipalities in the appropriate design, implementation, and administration of affordable infrastructure systems (see *National Shelter Delivery System Program* in subject index for related tasks). The purpose of this specific task was to develop a method for the Ecuadorian Development Bank to evaluate its basic infrastructure projects according to economic, financial, and technical criteria. With such a method in place, the cost of implementing projects should be reduced.

**Task #147**      March 1990: Completed      Sarai

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**Ecuador: WASHED Project Start-up Workshop** In September 1989, the Government

of Ecuador and USAID entered into a four-year agreement to implement the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project. The goal of this project, which complements USAID's Child Survival Project, is to improve the health status of infants and children in Ecuador. USAID/Ecuador asked WASH to provide ongoing technical assistance for WASHED through a series of tasks (see *WASHED* in the subject index for related tasks). This specific task consisted of holding a start-up workshop in May 1990 in which personnel involved in the project clarified their roles and responsibilities and developed draft workplans. See WASH Field Report No. 311.

**Task #148**      March 1990: Completed      Hafner

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**ADB/UNDP: Africa Policy Workshop and Sector Conference** At the request of the Bureau for Africa, a WASH consultant attended two key meetings on water and sanitation in May 1990 in Abidjan, Côte d'Ivoire, for representatives of African countries and external support agencies active in Africa. The meetings marked the conclusion of the International Drinking Water Supply and Sanitation Decade. The first was a workshop sponsored by the World Bank and the UNDP on rural water supply and sanitation achievements and strategies. The second was a two-day Regional Consultation on Water and Sanitation in Africa sponsored by the African Development Bank and the African Development Fund and focused on the ABD/ADF's Water Supply and Sector Policy, a document drafted in 1988 with the assistance of WASH.

**Task #149**      May 1990: Completed      Turner

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**Mid-Project Evaluation of WASH III: Involvement of Washington Operations Center Staff** According to its contract with A.I.D., WASH III was to be evaluated in 1990 at the mid-point of its five-year term. Under this task, the WASH Project provided assistance and information to the evaluation team and S&T/Health during the evaluation.

**Task #150**      March 1990: Completed      Roark

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**Zaire: Review of Water Supply and Sanitation Sector Programming** At the request of USAID/Kinshasa, WASH conducted an internal review of USAID's assistance to Zaire in the water and sanitation sector. The review

produced recommendations to improve A.I.D.'s programming and project implementation of ongoing water and sanitation activities. See WASH Field Report No. 313.

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Task #151      April 1990: Ongoing      Campbell

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**Cost Recovery for WASH Reports** In the past, WASH provided reports free of charge to any individual or organization. An analysis of requests showed that a substantial proportion of requests come from private individuals, consultants, graduate students, etc., in the U.S., Canada, or Europe. At the request of the S&T/Health, WASH carried out a six-month trial program of charging for reports unless they are requested by non-profit development organizations. On the basis of the results of the trial period the activity is being continued.

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Task #152      March 1990: Completed      Perez

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**Bolivia: Final Evaluation of Savings and Loan Water and Sanitation Project** USAID/La Paz requested WASH assistance in evaluating the Bolivian Savings and Loan System Water and Sanitation Project. The purpose of the project was to provide the Bolivian Savings and Loan System with financial resources and technical assistance to diversify its portfolio and to finance the installation of potable water and sanitation systems for low-income communities. The evaluation assisted USAID to make recommendations on future activities of this kind with the Bolivian Savings and Loan System or any other financial institution catering to the needs of urban poor families in Bolivia. See WASH Field Report No. 315.

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Task #153      April 1990: Ongoing      Bateman

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**Rapid Assessment of the Prevalence of Water and Sanitation-Related Diseases in Peri-Urban Areas** WASH was asked by S&T/Health to provide a systematic critical review of the methods, currently in use or now being proposed, for rapid epidemiological assessment. The methods will be reviewed with respect to their limitations, costs, and suitability for use in peri-urban areas. This task is organized into two separate phases. The first phase was a round-table meeting in May 1990 of experts in water and sanitation, epidemiology, water-related diseases, and biostatistics to clarify the problem to be addressed and discuss existing rapid assessment methods. The second phase will be to

research and write the final report, which will be available in early 1992.

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Task #154      April 1990: Completed      Walker

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**Maximizing the Economic Impact of Urban Water Supply and Sanitation Investment** At the request of S&T/Health, WASH carried out a study on the linkages between investment in urban water supply and sanitation and economic production. This task concentrated for the most part on urban areas where the economic gains come mainly from changes in commercial and industrial production. The outcome of the task will be a paper describing what is known about how increases in water and sanitation investments affect economic production and providing information on how to design urban water and sanitation projects so as to maximize their contribution to economic production. The study will be completed in early 1992.

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Task #155      April 1990: Completed      Sarai

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**Ecuador: Environmental Assessment of Infrastructure Projects for the Ecuadorian Development Bank** At the request of RHUDO/Ecuador, WASH assessed the environmental impacts of peri-urban infrastructure projects in Ecuador to determine whether existing pre- and post-investment procedures for residential water and sewer investments in low-income urban neighborhoods are causing environmental degradation and, if so, to suggest corrective actions. This assignment is one of a series of technical assistance activities for the National Shelter Delivery System Program designed to assist the Ecuadorian Development Bank and the Ecuadorian Institute of Sanitary Works in guiding urban development and municipal infrastructure agencies in achieving financial self-sufficiency. This task is part of a series of technical assistance activities for the National Shelter Delivery Program (See *National Shelter Delivery System Program* in the subject index for related tasks.)

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Task #156      June 1990: Completed      Rosensweig

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**UNDP/PROWESS: Monitoring and Evaluation Workshop for Water and Sanitation** Many international agencies involved in the water and sanitation sector are currently developing new monitoring and evaluation tools. To take advantage of these ongoing research activities and arrive at a

consensus on key evaluation indicators at district, regional, national, and global levels, UNDP/PROWESS conducted a workshop for 20 to 25 senior-level evaluation specialists in Geneva in late June 1990. At the request of S&T/Health, the WASH Project assisted in organizing and designing the workshop and provided a facilitator.

**Task #157**      May 1990: Completed      Turner

**Participation in NCIH and EPA Pollution Control Conferences** Under this task, WASH staff participated in two conferences in June 1990. For the NCIH (National Council for International Health) Conference in Washington, D.C., WASH staff moderated a panel discussion on environmental health and also assisted the UNDP/World Bank to prepare a paper for this panel. For the Environmental Protection Agency Pollution Control Conference, also in Washington, D.C., S&T/Health and WASH presented a poster session paper on wastewater management in developing countries.

**Task #158**      May 1990: Completed      Bendahmane

**Promotional Activities** At the request of S&T/Health, WASH prepared information about WASH activities for dissemination to A.I.D. missions and bureaus and to other development organizations. This task included preparation of a new conference display and a calendar/poster for 1990.

**Task #159**      May 1990: Completed      Hafner

**Participation in UNDP/Asian Development Bank Regional Meeting** At the request of S&T/Health, in June 1990 the WASH Project director attended the UNDP/Asian Development Bank Regional Consultation in Manila, the Philippines, and the follow-on meeting of the International Collaborative Council for Water Supply and Sanitation, also in Manila. These meetings were held in anticipation of the Global Consultation on Water and Sanitation in New Delhi, India, in September 1990 (see Task #180).

**Task #160**      May 1990: Ongoing      Perez

**Preparation of Guidelines for Water Reuse** The U.S. Environmental Protection Agency requested WASH assistance in updating the 1980 edition of its Guidelines for Water Reuse. The new guidelines will incorporate water reclamation experience in the past ten years and will cover

both developed and developing country applications. With increasing urban and industrial growth, water reclamation and reuse has become an attractive alternative where traditional supplies are limited. The new guidelines will be available in June 1992.

**Task #161**      May 1990: Ongoing      Yacoub

**Community Participation: Issues in Water Supply and Sanitation in Peri-Urban Areas** At the request of S&T/Health, WASH is preparing a paper on basic sociological aspects of peri-urban areas to assist planners in water and sanitation. The paper should meet the need for information on institutional arrangements for the delivery of water to peri-urban communities. Such communities present a special problem because they are normally not under the management of rural or urban water authorities and their economic and subsistence activities tend to fall in the informal sector. The paper will concentrate on the sociological considerations at the family level that will impact the implementation of community participation.

**Task #162**      May 1990: Ongoing      Roark

**Models of O&M Management** At the request of S&T/Health, WASH will produce a technical report on O&M systems to meet the need for information on selecting the optimum model for a given situation. The management of O&M for rural water and sanitation systems continues to be a major issue: many systems are on the books as in service but in reality are broken down or operating at less than design capacity because of inadequate O&M. The report will be aimed at project designers and managers within USAID, other international development organizations, and host country government officials responsible for O&M. It will provide an overview of the sector, describe models through case studies, analyze the necessary conditions for a particular model to be successful, and provide recommendations for policymakers to improve O&M. The report will be available in mid-1992.

**Task #163**      May 1990: Completed      Sarai

**Ecuador: WASHED Management Development Program for Decentralization—Phase I** At the request of USAID/Ecuador, WASH designed a management development program for decentralization for the Ecuadorian Institute of Sanitary Works (IEOS).

The major goals of decentralization include developing at the provincial level the financial and technical systems and management skills for IEOS to carry out the entire range of promotional, educational, administrative, construction, and operations and maintenance activities involved in rural water supply and sanitation. This task is part of WASH technical assistance to the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project in which WASH is helping strengthen the capability of the IEOS to provide rural water and sanitation services to eight provinces in Ecuador (see *WASHED* in the subject index for related tasks).

Task #164      May 1990: Completed      Sarai

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**Ecuador: Hygiene Education Program Development for the WASHED Project** This task is part of the technical assistance WASH is providing to USAID/Ecuador for the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project (see *WASHED* in the subject index for related tasks). This particular task involved assisting the Ecuadorian Institute of Sanitary Works (IEOS) to develop a hygiene education program so that the water and sanitation systems installed will realize the maximum health impact. WASH consultants worked for approximately six months to research and adjust the health messages and advise the promotion and education department of appropriate curricula and training for traditional medical practice and strategies to affect behavioral change in health and hygiene practice.

Task #165      June 1990: Ongoing      Yacoob

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**Village Committee Manual for Financial Management** At the request of S&T/Health, WASH is developing guidelines to provide community water committees with a clear and easily understood system of bookkeeping and financial management for the operation and maintenance of new or improved village water and sanitation systems. Included with the guidelines will be information on how to train community members in the financial management skills required for using the system described. The guidelines will be available for field testing in March 1992.

Task #166      June 1990: Completed      Hafner

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**Belize: Finalization of Project Paper Amendment** At the request of the USAID

mission in Belize, WASH assisted in the preparation of a project paper for the continuation of the USAID-supported project "Increased Productivity through Better Health." The project focuses on community participation aspects of water supply and sanitation and malaria and dengue fever control.

Task #167      June 1990: Completed      Hafner

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**African Development Bank Water and Sanitation Manual** In 1988, at the request of the Bureau for Africa, WASH assisted the African Development Bank (ADB) in developing a water and sanitation policy. As a continuation of that effort and to ensure that the staff of the ADB will be able to implement the policy efficiently and to attain its goals, WASH consultants assisted ADB staff to prepare a manual providing guidelines for designing and evaluating water and sanitation projects. (See also Task #184.)

Task #168      July 1990: Ongoing      Walker

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**Performance Indicators** At the request of RHUDO/SA, WASH will prepare a yearly profile of selected urban water and/or sanitation utilities in South American countries. The profiles will look at technical and financial aspects of performance.

Task #169      July 1990: Completed      Roark

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**Haiti: Solid Waste Management Market Survey** In collaboration with the Office of Housing and Urban Programs, the WASH Project arranged for a market survey of opportunities for private sector involvement in solid waste collection in Port-au-Prince. A local Haitian firm carried out the survey, which examined the household, business, and industrial sectors. WASH provided training in survey techniques and supervised implementation of the survey. The survey provided a basis for recommendations on a long-term solid waste management plan for Port-au-Prince including private-sector involvement and prospects for composting. See WASH Field Report No. 319.

Task #170      July 1990: Ongoing      Walker

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**An Economic Consideration of Water Supply and Sanitation Coverage Targets** At the request of S&T/Health, WASH is preparing a study to analyze the trade-off between sustainability and coverage and to explore

the correlation between coverage, measures of general economic growth, and development of other social sectors such as health and education. Unlike most studies of coverage, this one will focus on the resources a country can put into water and sanitation, not on the need for water and sanitation services. The study will be available in April 1992.

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Task #171      July 1990: Ongoing      Roark

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**Statistical Analysis of Health Interventions Related to Child Survival** In 1989 WASH analyzed selected health interventions and their relation to child survival. The objective of the study was to evaluate various socioeconomic and health variables with respect to child mortality. The results of the study were presented graphically with a short analysis of conclusions. Subsequently the Bureau for Africa requested that WASH extend and deepen the analysis and then convene a workshop for about 20 health sector experts to reexamine the data and open the discussion to a larger audience. Further studies were recommended for selected African countries using household data collected by other sources. The study will be completed in mid-1992.

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Task #172      July 1990: Completed      Rosensweig

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**Sri Lanka: Fifth Monitoring/Evaluation of Water and Sanitation Sector Project** At the request of USAID/Colombo, WASH conducted the fifth annual monitoring of the USAID-supported Water and Sanitation Sector Project, an institutional development project for the National Water Supply and Drainage Board. The monitoring activity focused on what remained to be done to ensure the sustainability of the project when external aid was withdrawn. (See also Tasks #135 and #233.)

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Task #173      July 1990: Completed      Rosensweig

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**PAHO Symposium and AIDIS Congress in Puerto Rico** At the request of S&T/Health, WASH assisted with planning and provided a facilitator for the Pan American Health Organization's biannual symposium on water and sanitation in Puerto Rico in September 1990. The conference focused on evaluating the International Drinking Water Supply and Sanitation Decade in Latin America. In addition, a WASH representative attended the meeting of the Inter-American Association of Sanitary

Engineering and Environmental Sciences (AIDIS), which followed the symposium.

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Task #174      July 1990: Completed      Rosensweig

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**Tunisia: Development of Training Programs for Water-User Associations** WASH received a request from USAID/Tunisia to carry out a series of short-term technical assistance activities to develop a national strategy for water-user associations as the primary vehicle to manage rural water supply systems in the entire country. The purpose of this task was to develop short training programs for the presidents, treasurers, and community members who are responsible for the water-user associations. (See *Water-User Associations National Strategy* in subject index for related tasks.)

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Task #175      August 1990: Completed      Sarai

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**Ecuador: Phase I Training of Trainers for WASHED Training Systems** This task continues the phased technical assistance for the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project, an institutional strengthening activity for the Ecuadorian Institute of Sanitary Works (IEOS). The WASH consultant worked with the IEOS staff to design a comprehensive training-of-trainers program for its personnel and conducted the training course. (See also Tasks #250 and #267 and *WASHED* in subject index for related tasks.) See WASH Field Report No. 325.

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Task #176      August 1990: Ongoing      Roark

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**Oman: Data Management** The Omani-American Joint Commission requested WASH technical assistance for the Ministry of Water Resources to implement a program to conserve and manage the country's limited groundwater resources (see *Oman Water Resources Project* in the subject index for related tasks). This task, the first in a series of tasks to be carried out over 18 months, involved setting up a program of wellwater sampling and analysis and establishing a computer-based information system to analyze water resources data. See WASH Field Report No. 325.

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Task #177      August 1990: Ongoing      Roark

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**Oman: Water Quality and Training** This task is the second in a series of tasks in which the Omani-American Joint Commission requested

WASH assistance for the Ministry of Water Resources in implementing a program to conserve and manage the country's limited groundwater resources (see *Oman Water Resources Project* in subject index for related tasks). The specific objectives of this task were to design a new water resources laboratory and develop a training program for laboratory technicians. See WASH Field Reports Nos. 326 and 327.

Task #178      August 1990: Completed      Rosensweig

**Tunisia: Training Materials for Pump Operators** WASH received a request from USAID/Tunisia to carry out a series of short-term technical assistance activities to develop a strategy for water-user associations in Tunisia. Under this task WASH developed job aids and a short introductory training program for pump operators. (See *Rural Potable Water Institutions Project* in subject index for related tasks.)

Task #179      September 1990: Completed      Rosensweig

**Bolivia: Final Evaluation of the PROCOSI Project** USAID/Bolivia requested that WASH provide a team of expatriate and national experts to conduct a final evaluation of the Child Survival PVO Network Project (PROCOSI) and make recommendations concerning the continuation of the project. PROCOSI focuses on the whole range of child survival strategies, including water and sanitation. See WASH Field Report No. 323.

Task #180      August 1990: Completed      Turner

**Global Consultation: New Delhi, India** At the request of S&T/Health, the WASH Project Deputy Director participated in the Global Consultation Meeting held in New Delhi, India, in September 1990, to mark the conclusion of the International Drinking Water Supply and Sanitation Decade. He and a representative from IDRC presented plans for GARNET, a decentralized network on applied research, and encouraged developing countries to participate. Following the meeting, the Deputy Director met with Government of India and UNICEF/India staff to discuss rainwater harvesting activities for an article in RAINDROP, the bulletin of the WASH Rainwater Harvesting Information Center.

Task #181      August 1990: Completed      Rosensweig

**Peace Corps: Guinea Worm Training-of-Trainers Workshop in Mali** At

the request of the Peace Corps, WASH held a workshop in Mali for Peace Corps trainers in guinea worm disease control activities in September 1990. The workshop employed a training-of-trainers guide published by WASH (WASH Technical Report No. 73). Also, three training-of-trainers guides specifically on guinea worm control, prepared by WASH and the Peace Corps, were used during the workshop (see WASH Field Report Nos. 329, 320, and 321). WASH has undertaken three other tasks to assist the Peace Corps Guinea Worm Eradication program with planning, training, production of training materials, and project start-up (see Tasks #65, #91, #122). See WASH Field Report No. 318.

Task #182      August 1990: Ongoing      Rosensweig

**Tunisia: General Planning and Administration for the Action Plan for the National Strategy for Water-User Associations** The purpose of this task is to provide general planning, information support, and liaison activities related to the overall management of the first set of short-term technical assistance activities that WASH is providing to USAID/Tunis in support of the Government of Tunisia's Action Plan for the National Strategy for Water-User Associations, which is intended to create and monitor water-user associations. (See *Water-User Associations National Strategy* in subject index for related tasks.)

Task #183      August 1990: Ongoing      Rosensweig

**Tunisia: Development of Training Program for Hygiene Education** This is one in a series of technical assistance tasks that WASH is providing to USAID/Tunisia in developing and implementing the Government of Tunisia's Action Plan for the National Strategy for Water-User Associations. The purpose of this task is to determine the best approach to hygiene education and to develop a training guide to train governorate-level health educators. (See *Water-User Associations National Strategy* in subject index for related tasks.)

Task #184      August 1990: Ongoing      Rosensweig

**African Development Bank Water and Sanitation Manual (Phase II)** Under Task #167 the Bureau for Africa requested that WASH assist the African Development

Bank (ADB) in preparing a manual on designing and evaluating water and sanitation projects. To continue this work, WASH finalized the manual based on ADB staff comments and conducted a seminar for concerned ADB staff on how to use the manual effectively. See WASH Field Report No. 333.

Task #185      September 1990: Ongoing      Walker

**Privatization of Water Utilities** At the request of S&T/Health, WASH is preparing a paper reviewing what is known about the techniques of privatization of water and sanitation utilities. It should provide interested governments with information on the issues involved in privatization and how some common problems can be approached. The study will draw on surveys and studies of techniques applied worldwide and particularly on WASH experience in Indonesia (see Task #186). The paper will be available in mid-1992.

Task #186      September 1990: Ongoing      Walker

**Indonesia: Private Sector Participation in Urban Water Supplies: Issues for Investment** USAID/Indonesia requested WASH assistance to investigate the opportunities for private sector involvement in providing urban water and sanitation. The investigation included an assessment of the government's past experience with private sector involvement, its views on the form future involvement should take, and an exploration of opportunities for specific projects. See WASH Field Reports Nos. 330 and 346.

Task #187      September 1990: Completed      Sarai

**Ecuador: Appropriate Technology Research for WASHED Project** This is one in a series of technical assistance tasks in which USAID/Ecuador requested that WASH provide technical expertise to the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project. This task focused on providing experience for the staff of the Ecuadorian Institute of Sanitary Works (IEOS) in conducting and managing applied research. A new unit called the UCETA (the Appropriate Technology Coordination Unit), was set up within IEOS to manage this project. The WASH consultant assisted IEOS in setting up this unit and developing procedures and protocols for applied research.

Task #188      September 1990: Ongoing      Bendahmane

**Preparation of State-of-the-Art Technical Information** Under this task the final editorial work will be completed on the manuscripts of two technical notes—one on disinfection (Task #90) and the other on leak detection (Task #71), a design and format for technical notes will be settled on, and the two technical notes will be printed and distributed. The format/design will be used for all subsequent technical notes. The other part of this task involves producing a third technical note at the request of S&T/Health. The topic of the third note is how to compare costs over time and among countries to avoid distortions in financial and economic analysis.

Task #189      October 1990: Completed      Rosensweig

**Tunisia: Training of Trainers for Community Organization Specialists** At the request of USAID/Tunisia, WASH consultants will conduct a training-of-trainers workshop for community organization specialists so that they in turn can train the officers and members of water-user associations in their basic responsibilities. The participants learned to use the training materials developed under Task #174. This task is one of a series of technical assistance activities aimed at assisting the Government of Tunisia to implement its Action Plan for the National Strategy for Water-User Associations. (See *Water-User Associations National Strategy* in subject index for related tasks.)

Task #190      September 1990: Completed      Yacoob

**Tunisia: Design of Evaluation Workshop for Regional Health Education Teams** In 1987 the Government of Tunisia formed an interministerial Regional Health Education Team to emphasize and develop the hygiene education component of the Potable Water Institutions Project. WASH consultants provided technical assistance to this team under Tasks #68 and #138. In September 1990, at the request of USAID/Tunisia, WASH held a three-day evaluation workshop to provide team members with information on different evaluation methodologies that can be used to assess progress in hygiene education. (See *Rural Potable Water Institutions Project* in subject index for related tasks.)

Task #191      September 1990: Ongoing      Bateman

**A Comparison of the Health Effects of Water Supply and Sanitation in Rural and Urban Settings** At the request of S&T/Health, WASH used data from the Demographic and Health Surveys (DHS) to examine the relationship between level of water and sanitation service and health status of children in urban, peri-urban, and rural settings. The study found that community-level sanitation was more significant than family-level sanitation from a health status point of view. It also confirmed that sanitation is just as important as water supply. The study's findings should help policymakers to design projects that will have the greatest health benefit.

Task #192      September 1990: Completed      Bateman

**Development of an Interim WASH Health Strategy** At the request of S&T/Health, WASH reviewed ways in which water and sanitation and various environmental health efforts can be integrated, setting an agenda for operational and applied research activities, and improving liaison and collaboration with other A.I.D projects and other health-oriented organizations.

Task #193      August 1990: Completed      Roark

**Oman: Data Management (Start-up Phase)** This task covers the initial start-up and team planning meeting expenses for Task #176.

Task #194      August 1990: Completed      Roark

**Oman: Water Quality and Training (Start-up Phase)** This task covers the initial start-up and team planning meeting expenses for Task #177.

Task #201      October 1990: Completed      Turner

**General Administration** See Task #1.

Task #202      October 1990: Completed      Turner

**General Technical Assistance** See Task #2.

Task #203      October 1990: Completed      Turner

**Annual Plan and Proactive Task Development** See Task #3.

Task #204      October 1990: Completed      Hafner

**Provision of Information Services** See Task #4.

Task #205      October 1990: Completed      Roark

**Africa Bureau Liaison** See Task #5.

Task #206      October 1990: Completed      Walker

**Asia and Private Enterprise Bureau Liaison** Under this task, a WASH staff person was designated to maintain liaison with the Bureau for Asia and Private Enterprise and with missions in Asia.

Task #207      October 1990: Completed      Bateman

**Latin America/Caribbean Bureau Liaison** See Task #7.

Task #208      October 1990: Completed      Turner

**WASH Liaison with Non-Regional A.I.D. Bureaus** See Task #8.

Task #209      October 1990: Completed      Hafner

**Collaboration with Non-A.I.D. Water Supply and Sanitation-Related Organizations** Task #9.

Task #210      October 1990: Completed      Turner

**WASH Staff Conference Participation** See Task #10.

Task #211      October 1990: Completed      Turner

**Task Development for Mission and Bureau Requests** See Task #111.

Task #212      October 1990: Completed      Rosensweig

**Europe and Near East Bureau Liaison** Under this task, a WASH staff person was designated to maintain liaison with the Bureau for Europe and Near East (ENE) and with missions in the ENE region.

Task #213      October 1990: Completed      Bendahmane

**Preparation and Dissemination of Information on WASH** At the request of S&T/Health, WASH developed, produced, and disseminated to A.I.D. missions and bureaus and other interested parties informative materials about the WASH project and WASH activities. Such materials include progress reports, task updates, fact sheets, catalogs, capability statements, posters, and brochures.

Task #214      October 1990: Completed      Rosensweig

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**Tunisia: Improving Training Skills of Engineers and Technicians** This task is part of the overall technical assistance WASH is providing to USAID/Tunis to develop and implement portions of the Action Plan for the National Strategy, which is intended to create and monitor water-user associations. The purpose of this specific task is to train engineers and technicians in each governorate to train pump operators. The trainees learned to conduct a short workshop using the training materials developed under a previous activity in this Action Plan (see Task #178). (See *Water-User Associations National Strategy* in subject index for related tasks.)

Task #215      October 1990: Completed      Sarai

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**Ecuador: Operation and Maintenance Systems for the WASHED Project** This task is one in a series of tasks in which WASH is providing technical assistance to the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project (see *WASHED* in subject index for related tasks). This task focused on assisting the O&M unit of the Ecuadorian Institute of Sanitary Works (IEOS) to develop O&M systems, protocols, and reporting procedures to be applied at the provincial and community levels. The WASH consultant also assisted IEOS in setting up provincial O&M units and provided training in O&M procedures.

Task #216      October 1990: Ongoing      Roark

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**Haiti: Solid Waste Management** In December 1989, USAID/Haiti asked WASH to assess whether a privatization approach to solid waste management in Haiti would be feasible (see Task #126). WASH was subsequently asked to carry out a market survey to see what companies were already involved in solid waste and what the market was for compost (Task #169). As a result of this survey, USAID asked WASH, in collaboration with the Cooperative Housing Federation, to assist the Government of Haiti to put a private sector solid waste management system in place. This task has been suspended because of the unstable political situation in Haiti. See WASH Field Report No. 337.

Task #217      October 1990: Ongoing      Hafner

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**International Workshop on Hygiene Behavior Measurement** At the request of the London School of Hygiene and Tropical Medicine of the University of London, WASH provided a facilitator for and sent two of its staff to an interdisciplinary workshop in April 1991 on measuring hygiene behavior at Oxford University. The goal of the workshop was to develop practical tools for measuring changes in hygiene behavior; topics to be considered include use of questionnaires, techniques of personal observation, and methods of recording observations. WASH staff also participated in the workshop.

Task #218      October 1990: Completed      Brahman

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**Haiti: Project Start-up Workshop** USAID/Port-au-Prince requested that WASH conduct a start-up workshop for the Integrated Water Supply and Sanitation Project for NGOs in the Central Plateau region of Haiti, a new effort aimed at promoting community participation, developing health facilities, and achieving sustainability through community management of water systems. This joint child survival-water supply and sanitation project resulted from a two-day participatory program design workshop held in Haiti in January 1990 (see Task #133).

Task #219      October 1990: Ongoing      Perez

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**LAC Bureau Water Supply and Sanitation Coverage Planning Documents—1990 Update** This task is a follow-on to Task #73 in which the LAC Bureau requested WASH assistance in preparing reports providing country-by-country water and sanitation coverage information on Central American, Andean, and Caribbean countries (see WASH Field Reports Nos. 209, 301, 302, and 303). The purpose of this task is to update these reports. See WASH Field Report No. 334.

Task #220      October 1990: Completed      Sarai

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**Ecuador: Application of Project Preparation and Evaluation Methodology** This is one in a series of tasks through which WASH is providing technical assistance to RHUDO/SA for the National Shelter Delivery System Program in the municipal sector of potable water and sewerage services in Ecuador (see *National Shelter Delivery System Program* in the subject index for related

tasks). This task, which was a follow-on to Task #146 in which a project preparation and evaluation methodology was developed for use by the Ecuadorian Development Bank to evaluate its projects, consisted of pilot testing and finalizing the methodology developed earlier.

Task #221      October 1990: Completed      Roark

**Swaziland: Impact Evaluation of USAID Rural Water Supply and Sanitation Project**

USAID/Swaziland requested WASH assistance in conducting an evaluation of the Swaziland Rural Water Borne Disease Control Project, which sought to strengthen and expand the delivery of preventive health services. The evaluation determined what impact has been brought about by or is associated with the efforts of the ten-year-long project. See WASH Field Report No. 328.

Task #222      November 1990: Ongoing      Hafner

**Peace Corps: Guinea Worm Disease Monitoring Workshop** In the fall of 1989, WASH began providing technical assistance to the Peace Corps in its guinea worm eradication activities (see Task #65). Since then, a number of joint activities have taken place (see Tasks #91, #122, and #181). Under this task, WASH facilitated a workshop in Cotonou, Benin, in June 1991 for Peace Corps staff from eight Western African countries, their host country government counterparts, and representatives of external support agencies to assess the first year of the Peace Corps Guinea Worm Eradication Program. See WASH Field Report No. 338.

Task #223      November 1990: Ongoing      Roark

**Final Revision of the WASH Pump Selection Manual** At the request of S&T/Health, WASH is preparing a revised version of a Pump Selection Manual (WASH Technical Report No. 61) published in 1989. The second edition will be expanded and modified and new graphics will be added to enhance the manual's role as a useful reference. Many ideas for revision were obtained from field tests in Sudan. The new version will be issued by the summer of 1992.

Task #224      January 1991: Ongoing      Rosensweig

**Tunisia: Training of Trainers for Hygiene Educators** This task is part of the ongoing technical assistance being provided to

USAID/Tunisia to implement water-user associations in Tunisia. The purpose of this particular task is to train the trainers of community health workers or governorate-level hygiene educators. The trainers will learn to conduct a one-week workshop for hygiene educators using the training materials developed under an earlier activity (see Task #183). (See *Water-User Associations National Strategy* in subject index for related tasks.)

Task #225      December 1990: Ongoing      Brantly

**LAC Environmental Health Indicators** At the request of the LAC Bureau, WASH is developing indicators that can be used to measure progress in improving the health-related environment and lay the foundation for recognition of environmental health issues in LAC program design and evaluation. The indicators cover water supply, sanitation, wastewater and solid waste management, and hazardous and toxic waste management as it relates to water resources. After the indicators have been developed, baseline data will be generated for two cities, and recommendations for possible short- and long-term A.I.D. interventions will be offered.

Task #226      December 1990: Ongoing      Rosensweig

**Tunisia: Water System Policy and Procedures** At the request of USAID/Tunis, two consultants from the WASH Project provided short-term technical assistance over a period of nine months to develop policies and procedures for O&M of rural water systems. A procedures manual for O&M will be developed as part of this task. This task is part of the ongoing technical assistance being provided by WASH to the Government of Tunisia in implementing its plan to decentralize O&M of rural systems through water-user associations (see *Water-User Associations National Strategy* in subject index for related tasks.)

Task #227      December 1990: Ongoing      Hafner

**Ghana: World Vision Project Start-up Workshop** At the request of USAID/Accra, WASH provided a facilitator to World Vision to carry out a project start-up workshop in January 1990 for a new Rural Water Project, a five-year-long activity with funding from the Conrad N. Hilton Foundation. In this project a special effort will be made to integrate community

participation, operations and maintenance, hygiene education, and sanitation. See WASH Field Report No. 345.

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Task #228      January 1991: Completed      Roark

**Mexico: Water Project Assessment**

USAID/Mexico requested WASH assistance to carry out a rapid assessment of a proposed water project in the Mezquital Valley (Hidalgo State) of Mexico sponsored by DESMI, a Mexican PVO, and the International Partnership for Human Development. DESMI recently purchased a drill rig and proposes to develop deep aquifers for village water supplies.

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Task #229      January 1991: Ongoing      Roark

**Oman: Surface Water Data Collection** The Government of Oman is launching a comprehensive national water management strategic plan. In anticipation of this plan, Oman has begun to strengthen its Ministry of Water Resources, the agency that will be responsible for implementing the plan, and to improve its data-gathering and water-management capabilities. The Omani-American Joint Commission requested WASH assistance in this effort through a series of tasks (see *Oman Water Resources Project* in subject index). In this task, WASH assisted Oman to upgrade and improve its network of gauging stations and to develop information on the physical characteristics of wadi basins in Northern Oman.

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Task #230      January 1991: Ongoing      Roark

**Oman: Groundwater Data Collection and Management** The Omani-American Joint Commission requested WASH assistance for the Ministry of Water Resources in the development and implementation of supplementary data collection programs focused on future resource management activities (see description for Task #229 and *Oman Water Resources Project* in the subject index for related tasks). In this task WASH consultants collected information on the extent to which wadi through-flows would likely add to the groundwater supply, evaluated the groundwater recharge enhancement techniques used to date in Oman, and collected information on salinity intrusion in the project area.

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Task #231      February 1991: Completed      Sarai

**Ecuador: Development of Financial Management Systems for Water and Wastewater Agencies** This task is part of the ongoing technical assistance being provided to RHUDO/Ecuador in the area of increasing the financial self-sufficiency of municipal infrastructure agencies in Ecuador through the National Shelter Delivery System Program (see subject index for related tasks). The purpose of this task is to develop business management systems in selected water and sewer system companies through the application of business, financial, economic, and operations planning techniques.

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Task #232      February 1991: Completed      Turner

**Background Paper for A.I.D. Environmental Health Workshop** S&T/Health organized a two-day workshop in February 1991 to discuss the office's environmental health initiative. A series of background papers was presented at the workshop to guide the Office of Health in setting priorities and in developing potential project interventions. WASH participated in the workshop and presented a background paper on water, sanitation, wastewater management, and drainage.

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Task #233      February 1991: Completed      Rosensweig

**Sri Lanka: Management Training Workshop** USAID/Sri Lanka requested WASH assistance to design and deliver a follow-up management development workshop for the National Water Supply and Drainage Board (NWSDB). Previously WASH conducted other workshops for NWSDB managers (see Task #135) focused on a range of management skills including meetings, performance monitoring and feedback, and developing performance indicators. This workshop was aimed specifically at improving the basic management skills of the management staff of the Greater Colombo and Western Regional Service Centers.

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Task #234      March 1991: Ongoing      Roark

**Geographic Information Systems** At the request of S&T/Health, WASH is investigating the potential uses of geographic information systems (GIS) for the WASH Project and the various types of hardware and software available. With the expansion of WASH into more

environmentally related subjects, consideration of GIS is timely.

Task #235      March 1991: Ongoing      Bateman

**Mali: CARE Integrated Water Supply and Sanitation/Control of Diarrheal Disease Workshop** At the request of CARE/Mali, WASH and PRITECH jointly designed and facilitated a five-day workshop for CARE in Mali in May 1991 on integrating water supply and sanitation and control of diarrheal disease. CARE currently has five water and sanitation projects in West Africa and four in Francophone countries. The complementary nature of oral rehydration therapy and water and sanitation programs has led CARE to conclude that the two interventions should be addressed in CARE programming.

Task #236      March 1991: Completed      Perez

**Peru: Water Quality Assessment/Cholera** At the request of USAID/Lima, WASH sent two consultants to Peru in March 1991 to identify water-supply deficiencies, design short-term corrective measures, and identify long-term needs and possibilities for interventions in water and sanitation given the cholera epidemic. The assistance was aimed at helping the Government of Peru to organize a unified, coordinated campaign stressing preventive environmental health measures as a complement to curative ones. See WASH Field Report No. 331.

Task #237      March 1991: Ongoing      Hafner

**WASH Development and Support of GARNET** In early 1990, the Global Applied Research Network (GARNET) was set up to serve as an informal association of worldwide organizations and agencies interested in sharing and disseminating information on research activities in the water and sanitation sector. In collaboration with UNDP/World Bank Water and Sanitation Program, WASH is serving as the Global Coordinating Agency for GARNET for a period of approximately 18 months.

Task #238      March 1991: Ongoing      Bateman

**Bangladesh: Collaboration with ICDDR,B** At the request of the International Center for Diarrheal Disease Research, Bangladesh (ICDDR,B) the WASH environmental health specialist visited Bangladesh in April 1991 to initiate collaboration between ICDDR,B and

WASH and to assist in the development of a diarrhea prevention research strategy. In November 1991, he assisted with a conference at ICDDR,B on regional applied research priorities.

Task #239      March 1991: Ongoing      Rosensweig

**Tunisia: General Planning and Administration II for the Action Plan for the National Strategy for Water-User Associations** The purpose of this task is to provide general planning, information support, and liaison activities related to the overall management of the second set of short-term technical assistance activities that WASH is providing to USAID/Tunis in support of the Government of Tunisia's Action Plan for the National Strategy, which is intended to create and monitor water-user associations (see *Water-User Associations National Strategy* in subject index for related tasks).

Task #240      March 1991: Completed      Rosensweig

**PAHO: Seminar on Integrating Environmental Health Concepts into Programming of Technical Cooperation** The Pan American Health Organization (PAHO) is undertaking a major study in order to identify all environmental health activities throughout the organization and its links to the program of environmental health. As part of this endeavor, PAHO hosted a one-and-a-half day seminar to discuss issues involved in integrating "health and environment" concepts into PAHO programming of technical cooperation. At the request of PAHO, a WASH consultant designed, organized, and facilitated the seminar, which was held in April 1991.

Task #241      March 1991: Completed      Perez

**Côte d'Ivoire: Peace Corps Urban Project Paper** At the request of the Peace Corps in Côte d'Ivoire, WASH helped design an urban environmental management program for all towns and cities except Abidjan. The program involves technical and community development volunteers with backgrounds in environmental management and training who work with community organizations and neighborhood leaders in developing locally based solid waste and sewage management systems and other environmental activities.

Task #242 April 1991: Completed Sarai

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**Ecuador: WASHED Management Development Workshop—Phase II** In September 1989, the Government of Ecuador and USAID entered into a four-year agreement to implement the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project. The purpose of the project is to strengthen the Ecuadorian Institute of Sanitary Works (IEOS) as an institution. WASH is assisting in this effort through various related assignments (see Tasks #163 and #320 and *WASHED* in the subject index for related tasks). This task focused on management development for the decentralization of rural water supply and sanitation. WASH conducted a five-day management training workshop for IEOS management staff.

Task #243 April 1991: Ongoing Turner

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**Central America: Planning for Coordinated International Technical Assistance** A collaborative program of technical assistance in water and sanitation for the Central American countries of El Salvador, Guatemala, Honduras, and Nicaragua was prepared in May 1991 by a Joint UNDP/World Bank Mission that included the director of WASH and representatives from the UNDP/World Bank Joint Water and Sanitation Program, UNICEF, PAHO, and WHO. The first phase of the recommended program was to set up a regional coordinating unit; the second was to establish country-level mechanisms for collaboration.

Task #244 April 1991: Completed Rosensweig

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**Tunisia: Social Marketing of Water-User Associations** The WASH Project is providing ongoing technical assistance to USAID/Tunis for developing the National Strategy for Water-User Associations (see *Water-User Associations National Strategy* in subject index for related tasks). The purpose of this particular assignment is to develop the materials and means of increasing public awareness of the concept of water-user associations through social marketing. See WASH Field Report No. 344.

Task #245 April 1991: Completed Hafner

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**A.I.D. Environmental Working Group Retreat** The Environmental Working Group of A.I.D. was established to develop an Agency

Environmental Action Plan and a Strategy Statement. S&T/Health requested WASH to assist in conducting a two-day retreat in April-May 1991 for the group to work on both documents and start planning potential responses to the most important environmental problems facing developing countries in the next 10 years. Specifically, WASH consultants designed and facilitated a team planning meeting to clarify goals, objectives, participants, and format of the retreat, coordinated the agenda and the development of materials for retreat participants, and conducted the event for approximately 45 participants.

Task #246 April 1991: Completed Perez

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**Turkey: OFDA Water Supply and Sanitation Evaluation of Kurdish Refugee Camps** OFDA requested WASH assistance in providing a water and sanitation specialist to participate in a Disaster Assistance Response Team (DART) sent to Turkey and Iraq in April 1991 to assist Kurdish refugees. The WASH consultant worked with a group of other specialists in such fields as medicine, logistics, and the provision of food supplies and shelter. The team performed a rapid assessment of the situation and recommended methods of providing crucial basic services in the refugee camps. See WASH Field Report No. 339.

Task #247 April 1991: Completed Hafner

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**Sector Meeting for African Non-Governmental Organizations** The Ligue Internationale d'Etude et de Promotion de la Santé Communautaire, a non-governmental organization based in Abidjan, and the International Secretariat for Water in Quebec, Canada, requested WASH assistance to design and deliver a one-week workshop in October 1991 for several African non-governmental organizations working in the water and sanitation sector. The purpose of the workshop was to help organizations from sub-Saharan African countries collaborate more effectively.

Task #248 May 1991: Completed Yacoob

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**Participation in the June 1991 NCIH Meeting** Under this task, WASH staff participated in the National Council for International Health annual meetings in Washington, DC, June 23-26, 1991. The WASH associate director for community participation

and hygiene education co-authored and presented a paper on the use of anthropology and epidemiology in guinea worm control among women, and WASH set up and staffed an exhibit booth.

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Task #249      April 1991: Ongoing      Sarai

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**Ecuador: WASHED Coordination for Years Two and Three** The purpose of this task is to provide general planning, management, and coordination of the technical assistance WASH is providing to the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project in Ecuador (see *WASHED* in the subject index for related tasks). This is a follow-on to Task #140 and serves as the coordinating task from April 1991 through April 1993.

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Task #250      April 1991: Completed      Sarai

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**Ecuador: WASHED Training of Trainers—Phase II** At the request of USAID/Quito, WASH is providing technical assistance to the Water and Sanitation for Health and Ecuadorian Development (WASHED) through a series of tasks (see *WASHED* in the subject index for related tasks). The overall goal is to strengthen the Ecuadorian Institute of Sanitary Works (IEOS) as an institution. This task is related to the training systems development component of WASHED. In an earlier task (see Task #175) WASH consultants developed a plan for the training department and conducted the first training of trainers. The present task involved the planning and implementation of the second training-of-trainers workshop in advanced instructional techniques for the IEOS training unit.

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Task #251      May 1991: Ongoing      Roark

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**Sustainability in Water Supply and Sanitation—Phase I** S&T/Health has asked WASH to prepare a report on the sustainability of new or improved water and sanitation systems. The task is being carried out in two phases. The first phase is to analyze the factors that determine sustainability as exemplified in recent water supply and sanitation projects. The second is to conduct post-project evaluations in several countries. The purpose of the task is to help USAID and other donor organizations improve project design and implementation so that

projects will continue after donor support has been withdrawn.

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Task #252      May 1991: Completed      Sarai

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**Ecuador: WASHED Annual Review Workshop** This task is one of a series of technical assistance assignments for the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project (see *WASHED* in subject index for related tasks). At the request of USAID/Quito, WASH is helping the Ecuadorian Institute of Sanitary Works (IEOS) to increase its institutional capacity. Under this particular task, WASH conducted the monitoring and review workshop in July 1991 to mark the end of the first year of WASHED. In addition, technical assistance was provided in the areas of appropriate technology, operations and maintenance, and hygiene education. See WASH Field Report No. 342.

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Task #253      May 1991: Completed      Perez

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**Peru: Workshop on Cholera and Urban Sanitation** Under Task #236, WASH sent two sanitary engineers to assist the Government of Peru to respond effectively to the cholera epidemic. In response to the recommendations of the consultants, USAID/Lima requested WASH assistance in planning and conducting a workshop in Lima with the specific objective of producing an inter-sectoral master action plan on water supply and sanitation to address the epidemic. The workshop, which was held in June 1991, was attended by representatives from concerned ministries, the World Bank, the Pan-American Health Organization, the U.N. Development Program, the Pan American Center for Sanitary Engineering and Environmental Sciences, and A.I.D. See WASH Field Report No. 343.

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Task #254      June 1991: Ongoing      Roark

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**Oman: Water Management** At the request of the Omani-American Joint Commission, WASH is providing technical assistance to the Omani Ministry of Water Resources in developing a comprehensive plan to conserve and manage Oman's limited water resources. The tasks are organized around three main subject areas: data collection for resource management, preparatory resource management activities, and institutional strengthening of the Ministry of Water Resources (see *Oman Water Resources Project* in subject

index for related tasks). Under this task, WASH consultants compared several methods for reducing salt-water intrusion into freshwater coastal aquifers.

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Task #255      June 1991: Ongoing      Roark

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**Oman: Technological Development** This task is part of the ongoing technical assistance being provided to the Ministry of Water Resources in Oman at the request of the Omani-American Joint Commission (see *Oman Water Resources Project* in the subject index for related tasks). Under this task WASH consultants identified suitable technologies for data acquisition on water resources, including remote sensing and geophysical data collection and airborne geophysics.

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Task #256      June 1991: Ongoing      Rosensweig

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**Decentralizing Water and Sanitation Services** At the request of S&T/Health, WASH is preparing a report on the decentralization of sector institutions. The report, which will be published in the fall of 1992, will describe what can be and what should be decentralized, identify problems countries have had in decentralizing, and describe approaches and models for accomplishing decentralization. It will be aimed at governments and donor organizations working with those governments that have already decided to decentralize but need help in figuring out how to go about it. Decentralization is seen as one of the keys to providing services more responsive to community and local needs.

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Task #257      June 1991: Completed      Perez

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**Cholera Task Force** In May 1991, a Cholera Task Force was set up within A.I.D. to respond to the cholera epidemic in Latin America and the Caribbean. At the request of S&T/Health, WASH provided technical assistance to the task force.

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Task #258      June 1991: Ongoing      Bendahmane

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**Computer Graphics Storyboard Presentation** In an effort to break away from over-reliance on the printed word in communicating information about the sector, WASH will experiment with a computer-generated and implemented slide show ("storyboard") presentation. The specific purpose of this task, requested by S&T/Health, is to

present the options available to countries hit by the cholera epidemic.

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Task #259      July 1991: Ongoing      Walker

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**Support for ISPAN Water Strategy Paper** At the request of the Bureau for Near East and Asia, the Irrigation Support Project for Asia and the Near East (ISPAN) is preparing a water resources strategy paper to guide A.I.D. investment in the water sector in the Near East and Asia. WASH is providing technical assistance to ISPAN in the development of the strategy paper.

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Task #260      July 1991: Ongoing      Brahman

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**Haiti: Training of Trainers for Hygiene Education/Community Development** As part of the ongoing efforts by USAID/Port-au-Prince to include water development in the Voluntary Agencies for Child Survival (VACS) Project, USAID/Haiti requested WASH assistance in designing and conducting a training-of-trainers workshop for hygiene education and community participation to ensure that the requisite health education and community participation activities take place (see also Tasks #82, #133, and #218). See WASH Field Report No. 350.

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Task #261      July 1991: Completed      Perez

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**Yemen: Strengthening of Operation and Maintenance Program** This is a follow-on to Task #15, in which WASH provided a plan and equipment list for the establishment of workshops for O&M services in support of rural water projects in Yemen. USAID/Sanaa purchased the recommended equipment, but no formal training sessions were held. At the request of the USAID mission in Yemen, a WASH consultant visited sites where equipment had been provided in order to review O&M procedures, assess their effectiveness, and provide on-site constructive advice. See WASH Field Report No. 347.

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Task #262      July 1991: Completed      Perez

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**Mali: Technical Assistance to Examine Health Effects of Dams in the Dogon Country** Nearly 100 dams have been constructed in the Dogon region of Mali over the last several years. The water in the dams is not potable and was meant to be used only for irrigation to increase traditional garden production; however, it is apparently being used for drinking water and is suspected of causing

water-related diseases. As a result, USAID/Bamako requested WASH technical assistance to conduct a rapid qualitative assessment of the health effects of the dams, to identify obvious immediate and long-term remedial actions, and to make recommendations for further study.

Task #263      July 1991: Completed      Hafner

**Danube River Basin Study: Preparation and Planning** At the request of the Bureau for Europe/Near East, WASH will conduct a series of short-term technical assistance activities in Hungary, Bulgaria, Romania, and Yugoslavia. The goal of these activities is to identify and collect data relevant to the establishment of a management program for the Danube River Basin. Specifically, WASH will conduct an inventory of point-source discharges and identify municipal government administrative and finance authorities in the four countries mentioned. Under this task, WASH provided the initial general planning, information support, and liaison activities related to the overall management of the technical assistance. See also Task #271.

Task #264      July 1991: Ongoing      Hafner

**Collaboration with Asian Institute of Technology and Participation in Rainwater Harvesting Conference** At the request of USAID/Bangkok, the WASH information manager/librarian participated in the 5th international rainwater harvesting conference in Taiwan in August 1991. The conference is the major yearly event for researchers and practitioners involved in rainwater harvesting. (See Task #49 for a description of WASH's Rainwater Harvesting Information Center.) In addition, the WASH staff members presented a series of lectures on low-cost data collection methods at the Asian Institute of Technology.

Task #265      August 1991: Completed      Perez

**El Salvador: Water Contamination Survey** At the request of USAID/San Salvador, WASH consultants evaluated the status of surface and groundwater contamination in selected waterways in southwestern El Salvador. The data will be used by the Government of El Salvador and a number of local PVOs as the basis for devising a national strategy for natural resource management. In El Salvador, and elsewhere,

environmental contamination threatens the poor with increased living costs because of the scarcity of potable water. See WASH Field Report No. 354.

Task #266      August 1991: Ongoing      Hafner

**Water Supply and Sanitation Collaborative Council Meeting in Oslo, September 18-20, 1991** At the request of S&T/Health, the WASH deputy director attended the September 1991 meeting of the Water Supply and Sanitation Collaborative Council in Oslo and made a presentation on the status of GARNET (see Task #237). The primary objective of this meeting of the council, for which the overall theme was "sustainability," is to provide a forum for the exchange of ideas and experiences between sector professionals from both developed and developing countries.

Task #267      August 1991: Completed      Sarai

**Ecuador: Advanced Training of Trainers for WASHED—Phase III** In September 1989, the Government of Ecuador and USAID entered into a four-year agreement to implement the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project. Through a series of tasks, WASH, at the request of USAID/Quito, is helping the Ecuadorian Institute of Sanitary Works to increase its institutional capacity to provide rural water and sanitation services (see *WASHED* in subject index for related tasks). A key aspect of the project is the development of a permanent training unit within IEOS. In this task WASH designed and conducted an eight-day training-of-trainers workshop, built on the draft design developed under Task #175 and continued under Task #250.

Task #268      August 1991: Ongoing      Roark

**Benin: Final Evaluation of Water Supply and Sanitation Project** At the request of USAID/Benin, a three-person team of WASH consultants conducted the final evaluation of the Benin Rural Water Supply Project. The USAID-supported project, which was completed in September 1991, aimed to provide potable water supplies and materials, train rural people to construct sanitary facilities, and promote improved health practices. Approximately 250,000 persons in selected districts of central Benin are the project beneficiaries.

Task #269      August 1991: Ongoing      Yacoob

**Burkina Faso: Dracunculiasis Operators Research Network (DORN) Workshop** WASH staff members prepared and implemented two sessions of the September 1991 Dracunculiasis Operators Research Network (DORN) workshop held in Ouagadougou, Burkina Faso, for researchers involved in guinea worm prevention. One session was on hygiene education, the other on qualitative research methods. The workshop, which was attended by 30 francophone researchers from the region, was organized on behalf of UNICEF by the London School of Hygiene and Tropical Medicine.

Task #270      August 1991: Ongoing      Bateman

**Nicaragua: Assessment of Water and Sanitation Infrastructure and Preparedness for Cholera** At the request of USAID/Managua, WASH consultants were part of a team of consultants from PRITECH and HEALTHCOM that performed an assessment in the fall of 1991 of Nicaragua's preparedness for cholera. The assessment covered cholera treatment options, health education and communication capabilities, and water supply and sanitation as related to cholera prevention. The WASH consultants conducted an institutional assessment of water supply and sanitation in Nicaragua and reviewed the appropriate existing plans for cholera prevention within the water and sanitation sector.

Task #271      September 1991: Ongoing      Hafner

**Danube River Basin Study** A number of multilateral and bilateral institutions and governments are participating in designing a comprehensive environmental program for the Danube. At the request of the Bureau for Europe, WASH consultants are conducting an inventory of point-source discharges and municipal government administrative and finance authorities in the riparian countries of the Danube River Basin. The inventory will be conducted over a ten-month period beginning in September 1991. See also Task #263.

Task #272      September 1991: Ongoing      Yacoob

**Nigeria: Development of a Water Supply and Sanitation Strategy** At the request of S&T/Health, WASH consultants were part of a team of health professionals who were assisting USAID/Lagos to develop a health strategy. WASH

provided support to various members of the team and specifically to those charged with developing a strategy for the water and sanitation sector. WASH also provided a trainer to facilitate the team planning meeting for the activity.

Task #301      October 1991: Ongoing      Turner

**General Administration** See Task #1

Task #302      October 1991: Ongoing      Turner

**General Technical Assistance** See Task #2

Task #303      October 1991: Ongoing      Turner

**Annual Plan and Proactive Task Development** See Task #3

Task #304      October 1991: Ongoing      Hafner

**Provision of Information Services** See Task #4

Task #305      October 1991: Ongoing      Roark

**Africa Bureau Liaison** See Task #5

Task #306      October 1991: Ongoing      Walker

**Asia Bureau Liaison** Under this task, a WASH staff person is designated to maintain liaison with the A.I.D. Bureau for Asia for WASH III, fiscal year 1992. This involves developing and reinforcing contacts between WASH and the Bureau for Asia and missions in Asia, indentifying Bureau needs in the water supply and sanitation sectors, informing Bureau and mission officials of WASH resources, formulating preliminary WASH responses to Bureau and mission needs, and targeting high priority missions where WASH has not provided assistance.

Task #307      October 1991: Ongoing      Bateman

**Latin American/Caribbean Bureau Liaison** See Task #7

Task #308      October 1991: Ongoing      Hafner

**Europe Bureau Liaison** Under this task, a WASH staff person is designated to maintain liaison with the A.I.D. Bureau for Europe for WASH III, fiscal year 1992. This involves developing and reinforcing contacts between WASH and the Bureau for Europe and missions in Europe, indentifying Bureau needs in the

water supply and sanitation sectors, informing Bureau and mission officials of WASH resources, formulating preliminary WASH responses to Bureau and mission needs, and targeting high priority missions where WASH has not provided assistance.

Task #309      October 1991: Ongoing      Rosensweig

**Near East Bureau Liaison** Under this task, a WASH staff person is designated to maintain liaison with the A.I.D. Bureau for Near East for WASH III, fiscal year 1992. This involves developing and reinforcing contacts between WASH and the Bureau for Near East and missions in Near East, identifying Bureau needs in the water supply and sanitation sectors, informing Bureau and mission officials of WASH resources, formulating preliminary WASH responses to Bureau and mission needs, and targeting high priority missions where WASH has not provided assistance.

Task #310      October 1991: Ongoing      Perez

**Liaison with Non-Regional A.I.D. Bureaus**  
See Task #8

Task #311      October 1991: Ongoing      Hafner

**Collaboration with Non-A.I.D. Water Supply and Sanitation-Related Organization** See Task #9

Task #312      October 1991: Ongoing      Turner

**WASH Staff Conference Participation** See Task #10

Task #313      October 1991: Ongoing      Turner

**Task Development for Mission and Bureau Requests** See Task #111

Task #314      October 1991: Ongoing      Bendahmane

**Preparation and Dissemination of Information on WASH** See Task #213

Task #315      October 1991: Ongoing      Brantly

**Assessment Tools for Identifying and Prioritizing Environmental Health Problems** At the request of R&D/Health, WASH is assessing methods of identifying and prioritizing environmental health problems in developing countries. Such methods are needed

because the severity of environmental health problems varies widely from country to country and the resources to address such problems are limited. This task will review modern risk assessment and management approaches to provide a conceptual framework and procedures appropriate to developing countries.

Task #316      October 1991: Ongoing      Bateman

**Production of Articles on Water Supply, Sanitation, and Health** Under this task, the WASH environmental health specialist will write three articles based on WASH-sponsored research on the health aspects of water and sanitation. The articles will be suitable for publication in scholarly journals on health. (See Task #191 for a description of the research.)

Task #317      October 1991: Ongoing      Perez

**Dominican Republic: Environmental Guidelines for PVOs** At the request of USAID/Santa Domingo, WASH is developing environmental guidelines for urban and rural potable water and sanitation projects in the Dominican Republic that can be easily used by PVOs to design environmentally sound subprojects. As part of the activity, WASH will also provide training in the use of the guidelines to personnel of the PVOs, the USAID mission, and the PVO Co-financing Project, an A.I.D.-supported project aimed at increasing the capability of Dominican PVOs and NGOs to deliver selected services to the poor.

Task #318      October 1991: Ongoing      Rosensweig

**Jamaica: Management Analysis of the National Water Commission** At the request of USAID/Kingston, WASH consultants carried out a comprehensive management analysis of the National Water Commission, the parastatal agency responsible for water supply and sanitation throughout the island. The commission has experienced problems that limit its effectiveness, especially in delivering services to low-income Jamaicans. The potential for private-sector involvement was explored as part of the analysis.

Task #319      October 1991: Ongoing      Sarai

**Ecuador: Project Preparation Workshop** USAID/Quito and RHUDO have requested WASH assistance in strengthening the technical,

operating, administrative, and financial systems of municipal agencies responsible for providing water and sewerage to low-income communities for the National Shelter Delivery System Program. This assistance has been provided by means of a series of activities (see *National Shelter Delivery System Program* in subject index for related tasks). This particular task involves conducting a workshop in March 1992 on the preparation of infrastructure projects in peri-urban areas.

Task #320      October 1991: Ongoing      Sarai

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**Ecuador: WASHED Management**

**Development Workshop Phase III** This task is part of a four-year program of phased technical assistance to the Water and Sanitation for Health and Ecuadorian Development (WASHED) Project. At the request of USAID/Quito, WASH conducted a five-day workshop to help personnel of the Ecuadorian Institute of Sanitary Works (IEOS) to acquire the management skills needed to supervise staff and to delegate work under a program of decentralization (see Tasks #163 and #242 and *WASHED* in subject index for related tasks).

Task #321      October 1991: Completed      Bendahmane

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**Preparation of U.S. Report on Freshwater Resources** At the request of R&D/Health, WASH coordinated the editing and production of the U.S. report on Protection of the Quality and Supply of Freshwater Resources prepared by an inter-agency task force. WASH also wrote two sections of the report, one on drinking water and sanitation and the other on water and sustainable urban development. The paper is for the International Conference on Water and the Environment, Dublin, Ireland, January 1992.

Task #322      October 1991: Ongoing      Bateman

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**Cholera Task Force II** At the request of the Bureau for Latin America, WASH is providing ongoing technical assistance as part of A.I.D.'s response to the cholera outbreak in Latin America. Specific tasks include general coordination with R&D/Health and the LAC Bureau and with other cooperating agencies and central contractors (PRITECH and HEALTHCOM), participation in cholera workshops and seminars, and identification and recruitment of Spanish-speaking specialists in

various fields to carry out cholera-related assignments.

Task #323      October 1991: Ongoing      Bateman

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**Cholera Prevention: Assessing the Options**

At the request of the LAC Bureau, a WASH consultant is preparing a concise review of program and planning options for cholera prevention at the country level, with emphasis on what is practical within the local context. The task will draw on the WASH Peru experience (see Task #236) as a case study of an approach to assessing and addressing the problem of cholera.

Task #324      November 1991: Ongoing      Yacoob

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**Belize: Assessment of Rural Water Supply Sector** USAID/Belize requested WASH assistance to strengthen sectoral institutional capacity at all levels (central, district, and community). Three inter-related tasks are being carried out: (1) baseline assessments for institutional analysis, community capability, operations and maintenance management, and vector control (to be provided by the Office of Health), (2) review of methodologies being used for community data gathering, and (3) a policy dialogue meeting to outline new policies and action plans for institutional change.

Task #325      October 1991: Ongoing      Rosensweig

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**Tunisia: Refresher Workshops for Trainers** WASH is providing assistance to the Government of Tunisia to implement its National Action Plan for Water-User Associations. Three training-of-trainers workshops were carried out as part of this effort: one for community organization specialists (Task #189), one for engineers (Task #214), and one for community health workers (Task #224). Under the current task, WASH will design and deliver two one-week refresher workshops for the community organization specialists and engineers to reinforce skills learned earlier. (See *Water-User Associations National Strategy* in subject index for related tasks.)

Task #326      November 1991: Ongoing      Roark

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**International Conference on Solid Waste, São Paulo, Brazil** USAID/Brasilia requested that WASH provide a specialist in waste management to participate in an International Seminar on Waste Processing and Management

Technologies in São Paulo, Brazil, in November 1991.

Task #327      November 1991: Ongoing      Hafner

**IRC Workshops/UNESCO Seminar on Information Management** A representative of the WASH Project participated in two seminars during November 1991, at the request of R&D/Health. The first seminar, sponsored by the International Reference Centre, was on information management; the second, sponsored by UNESCO, was on information related to water and the environment.

Task #328      November 1991: Ongoing      Roark

**Nairobi Urban Health Workshop** At the request of USAID/REDSO/East Africa, WASH planned, organized, and facilitated a roundtable discussion of urban health issues in Africa in Nairobi, December 8-19, 1991. The roundtable was attended by 13 specialists in various environmental health disciplines. Presentations were made by representatives of several international and local organizations. Recommendations were drawn up outlining future potential policy objectives for A.I.D.

Task #329      November 1991: Ongoing      Bateman

**Bolivia: Cholera Assessment** At the request of USAID/La Paz, WASH and PRITECH are conducting an assessment of the current cholera situation in Bolivia. It will cover activities already undertaken, coordination among groups, gaps in implementation and planning, and needs—both short- and long-term.

Task #330      November 1991: Ongoing      Sarai

**Assistance to Europe Bureau/Environmental and Natural Resource Division** At the request of the Bureau for Europe, WASH is providing technical and administrative support to the Division of Environment and Natural Resources during the period November 1991 to June 1992. The goal is to coordinate and monitor various environmental activities related to the Danube and Hornad River Basins in Eastern Europe (see Tasks #263, #271, #331) as well as activities involving the Black Sea.

Task #331      December 1991: Ongoing      Hafner

**Czechoslovakia: Hornad River Study** At the request of Bureau for Europe, WASH will prepare

the terms of reference for a water quality management plan for the Hornad River Basin in eastern Czechoslovakia and Hungary. The river is polluted from municipal and industrial point sources and from agricultural runoff. Improved management of water quality is a priority endeavor. See also the Danube River Basin Study (Tasks #263 and #271).

Task #332      December 1991: Completed      Perez

**Western Samoa: OFDA Disaster Assistance** At the request of A.I.D.'s Office of Foreign Disaster Assistance, a WASH consultant joined the Disaster Assistance Response Team sent to Western Samoa to assess the damage from a cyclone which hit the country on December 6, 1991, and to recommend ways to alleviate the situation. The WASH consultant looked at the status of water, sanitation, and shelter and suggested ways to provide emergency basic services.

Task #333      December 1991: Ongoing      Rosensweig

**Tunisia: Preparation of Water-User Associations Procedures Manual** Through a series of tasks, WASH is providing assistance to the Government of Tunisia to promote water-user associations as a way to decentralize operations and maintenance of rural systems. As these tasks are now drawing to a close, WASH has been asked by USAID/Tunis to prepare guidelines and procedures for forming water-user associations. (See *Water-User Associations National Strategy* in the subject index for related tasks.)

Task #334      December 1991: Ongoing      Perez

**Guatemala: Monitoring Hygiene Behavior/CARE** WASH and the Quality Assurance Project, a centrally funded A.I.D. contract, are developing an approach for monitoring CARE water supply and sanitation programs in Guatemala at the request of CARE/Guatemala. The task will pull together recent advances in defining and monitoring hygiene behaviors, project management, and management information systems.

Task #335      December 1991: Ongoing      Rosensweig

**Tunisia: Development of a Training System for Water-User Associations** At the request of USAID/Tunis, a WASH consultant will develop a training system for the promotion of water-user

associations to assure that the required training takes place in a well-organized manner. This task is part of an overall effort to put O&M of rural systems in the hands of user associations. (See *Water-User Associations National Strategy* in the subject index for related tasks.)

Task #336      December 1991: Ongoing      Rosensweig

**Assessing the Effectiveness of Wastewater and Solid Waste Management** At the request of R&D/Health, WASH is conducting a five-phase activity to clarify options for improving management of solid waste and wastewater in developing countries and for developing an assessment tool to choose among the options. The activity will focus on options that are realistic given the available resources and existing institutions of developing countries. The report is expected to be published in March 1993.

Task #337      December 1991: Ongoing      Perez

**Update of Latrine Construction Training Guide** "A Workshop Design for Latrine Construction" (Technical Report No. 25) was published by WASH in 1984. At the request of R&D/Health, WASH is updating the guide to take into account recent learning about new latrine technologies and the dynamics of hygiene behavior and community involvement. The revised manual will be available in May 1992.

Task #338      December 1991: Ongoing      Perez

**Understanding the Constraints of the Urban Formal Sector** At the request of R&D/Health, WASH is conducting a study to identify the

constraints that prevent formal institutions (municipal governments and national water and sewerage agencies) from providing water and sanitation services to poor families living in the informal urban or peri-urban sector. Such communities are not usually officially recognized; hence no government agency is responsible for them, even though they are growing very rapidly. The study, which will be available in September 1992, should provide ideas of how to build a bridge between formal institutions and peri-urban communities.

Task #339      December 1991: Ongoing      Perez

**Highlighting Sanitation Needs in Peri-Urban Areas** To increase understanding of the extent of sanitation problems and needs in peri-urban areas, WASH is preparing a brief issues paper and holding a workshop for experts on the subject to exchange ideas. Sanitation has been largely ignored even though lack of sanitation (in particular management of human excrement) is presenting a grave risk to health, especially in peri-urban areas. The issues paper will provide guidance to A.I.D. project designers.

Task #341      December 1991: Completed      Perez

**Suriname: Cholera Assessment/Health Education** At the request of the U.S. Embassy in Suriname, WASH and HEALTHCOM assessed conditions in Suriname regarding food handling, water collection and storage, and household sanitation, in light of the threat of cholera, and recommended actions for prevention and preparedness, including educational programs.

### 3. WASH REPORTS

The following is a comprehensive list of WASH Technical and Field Reports arranged numerically. The Technical Reports are listed first. Each citation includes the title, author, date of publication, and availability in translation. Indices of reports by subject and author may be found on pages 81 and 88, respectively. All assessments and evaluations are listed on page 92 by year.

#### Technical Reports

- TR 1 *Triocide Questions and Answers*. November 1980. Prepared by Peter J. Kolsky.
- TR 2 *Possible Disinfection of Oral Rehydration Solutions*. November 1980. Prepared by Raymond B. Isely, Richard Cash, and Lincoln Chen.
- TR 3 *Training of Rural Community Development Workers in Health Education, with Special Reference to Water Supply Protection and Use/Maintenance of Sanitation Facilities*. March 1981. Prepared by Guy Steuart and Carla Rull.
- TR 4 *Evaluation Methods for Community Rural Water Supply and Sanitation Projects in Developing Countries: A Synthesis of Available Information*. March 1981. Prepared by Robert J. Struba.
- TR 5 *The Choice of Health Status Indicators to Evaluate Water and Sanitation Projects in North Cameroon: A Synthesis of Available Information*. April 1981. Prepared by Robert J. Struba and Raymond B. Isely. Also available in French.
- TR 6 *Women, Water, and the Decade*. Presented at the International Affairs Session of the American Water Works Association, St. Louis, Missouri, June 9, 1981. June 1981. Prepared by Mary L. Elmendorf.
- TR 7 *Facilitation of Community Organization: An Approach to Water and Sanitation Programs in Developing Countries*. June 1981. Prepared by Raymond B. Isely.
- TR 8 *Intégration de l'Approvisionnement en Eau et de l'Assainissement du Milieu dans les Programmes de Soins Primaires*. October 1981. Prepared by Raymond B. Isely, John Tomaro, and John Paul. Available in French only.
- TR 9 *Toward an Asia Bureau Water and Sanitation Policy Statement*. September 1981. Prepared by James F. Thomson.
- TR 10 *Social and Economic Preconditions for Water Supply and Sanitation Programs*. September 1981. Prepared by Dennis B. Warner.
- TR 11 *The Role of Women as Participants and Beneficiaries in Water Supply and Sanitation Programs*. December 1981. Prepared by Raymond B. Isely and Mary L. Elmendorf. Also available in French and Spanish.
- TR 12 *Measuring and Evaluating Diarrhea and Malabsorption in Association with Village WS&S*. (Guatemala). December 1981. Prepared by Branko Cvjetanovic, Lincoln Chen, Richard Kronmal, Charles Rohde, Robert Suskind, Robert J. Struba, and Kenneth McElroy.
- TR 13 *Participants Manual for Sessions on WS&S: USAID Workshop on Primary Health Care in Africa*. February 1982. Prepared by Raymond B. Isely, Craig R. Hafner, Daniel A. Okun, Morris A. Shiffman, Thomas Talbert, and Marjorie L. Kupper.
- TR 14 *WS&S in Rural Development: Proceedings of a Conference for Private and Voluntary Organizations, December 1-4, 1981*. December 1981. Prepared by WASH Staff.
- TR 15 *Application of Health Education to Water Supply and Sanitation Projects in Africa: A Discussion Paper*. October 1982. Prepared by Raymond B. Isely and Kathleen A. Parker.
- TR 16 *Relating Improvements in Water Supply and Sanitation to Nutritional Status*. October 1982. Prepared by Raymond B. Isely.

- TR 17 *Water and Sanitation-Related Health Constraints on Women's Contributions to the Economic Development of Communities*. October 1982. Prepared by Mary L. Elmendorf and Raymond B. Isely.
- TR 18 *Community Participation and Women's Role in Water Supply and Sanitation in Developing Countries: A Three-Part Bibliography by Author, Subject, and Country*. November 1982. Prepared by Ellen Kendall.
- TR 19 *Africa Bureau Domestic Water and Sanitation Strategy Statement*. January 1983. Prepared by John B. Tomaro and Raymond B. Isely.
- TR 20 *Human Resource Development Planning: Guidelines for the Water Supply and Sanitation Sector*. July 1988. Prepared by J. E. S. Lawrence and J. B. Tomaro.
- TR 21 *Women's Roles in Water and Sanitation in Developing Countries: A Four-Part Bibliography by Author, Subject, Phase of Development, and Country*. February 1984. Prepared by Alice J. Smith.
- TR 22 *Human Resource Development: A Selected and Annotated Bibliography for Use in the Water Supply and Sanitation Sector*. February 1984. Prepared by Vernon Razak.
- TR 23 *Hydropneumatic Pump System Development*. April 1984. Prepared by Yaron M. Sternberg and Jonathan French.
- TR 24 *Pretesting and Revising Visual Materials for Water Supply and Sanitation Programs*. September 1984. Prepared by Lamar Cox, Ralph Wileman, and Raymond B. Isely.
- TR 25 *A Workshop Design for Latrine Construction: A Training Guide*. June 1984. Prepared by Maria LeClere and Keith Sherer. Also available in French and Spanish.
- TR 26 *A Workshop Design for Handpump Installation and Maintenance: A Training Guide*. June 1984. Prepared by P. Alan Pashkevich and Claudia Liebler. Also available in French and Spanish.
- TR 27 *A Workshop Design for Rainwater Roof Catchment Systems: A Training Guide*. June 1984. Prepared by Daniel B. Edwards, Kent Keller, and David I. Yohalem. Also available in French and Spanish.
- TR 28 *A Workshop Design for Spring Capping: A Training Guide*. September 1984. Prepared by Wilma Gormley, David R. Goff, and Carl R. Johnson. Also available in French and Spanish.
- TR 29 *Surface Water Treatment for Communities in Developing Countries*. September 1984. Prepared by Daniel A. Okun and Christopher Schulz.
- TR 30 *Developing and Using Audio-Visual Materials in Water Supply and Sanitation Programs*. October 1984. Prepared by Barry Karlin and Raymond B. Isely.
- TR 31 *Linking Water Supply and Sanitation to Oral Rehydration Therapy in the Control of Diarrheal Diseases*. July 1985. Prepared by Raymond B. Isely.
- TR 32 *A Facilitator Guide for Conducting a Team Planning Meeting*. December 1985. Prepared by Wilma Gormley and Fred Rosensweig.
- TR 32S *Guide for Conducting a Debriefing, Supplement to a Facilitator Guide for Conducting a Team Planning Meeting*. July 1988. Prepared by Fred Rosensweig.
- TR 33 *A Workshop Design for Community Participation, Volume I—Starting Work with Communities, and Volume II—Planning and Implementing Sustainable Projects*. December 1988. Prepared by Raymond B. Isely and David I. Yohalem.
- TR 34 *A Workshop Design for Well Improvement: Protecting Open Wells*. May 1988. Prepared by Maria Nagorski, Charles S. Pineo, Scott Loomis, and Oscar Larrea. Also available in French and Spanish.
- TR 35 *Assessment of the Operations and Maintenance Component of Water Supply Projects*. June 1986. Prepared by James K. Jordan, Peter Buijs, and Alan S. Wyatt.
- TR 36 *Water Supply and Sanitation in the Health Sector in the Asia Region: Information Needs and Program Priorities*. February 1986. Prepared by John Briscoe.

- TR 37 *Guidelines for Institutional Assessment: Water and Wastewater Institutions*. February 1988. Prepared by Donald E. Cullivan, Bruce Tippet, Daniel B. Edwards, Fred Rosensweig, and James McCaffery. Also available in French, Spanish, and Arabic.
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## Appendix A: WASH Evaluations and Assessments

### EVALUATIONS

1980

FR 1 *Socio-Cultural and Economic Characteristics of Conditions in Ancash and La Libertad, Peru: Questions to be Considered in an Evaluation of CARE-Sponsored Water, Sewage, and Health Projects.*

1981

FR 22 *Evaluation of Yemen Water Supply Systems Management Project.*

FR 24 *Community Water Supply and Sanitation in Burundi: Report of an Evaluation Team.*

FR 27 - *Strategy for Implementation and Evaluation of the Togo Rural Wells and Sanitation Project.*

1982

FR 35 *Scope of Work for the Health Outcome Evaluation of the Health Sector II Project in the Dominican Republic.*

FR 38 *Recommendations for the Rural Water and Environmental Sanitation Project in Peru.*

1983

FR 69 *Diagnosis and Recommendations for Rural Water and Sanitation Systems in Honduras.*

FR 71 *Evaluation of Foster Parents Plan's Water Supply and Sanitation Projects in Yogyakarta, Indonesia.*

FR 82 *Evaluation of the Togo Rural Water Supply Project: Observations of a WASH Participant.*

FR 83 *Evaluation of CARE/Indonesia Water Supply Projects.*

FR 84 *Evaluation of Health and Social Benefit of Springs Capped for Irrigation, Further Adapted for Domestic Use in Central Tunisia.*

FR 96 *Water Supply Program of Foster Parents Plan in Haiti.*

FR 105 *Malawi Self-Help Rural Water Supply Program: A Mid-Term Evaluation of the USAID-Financed Project.*

1984

FR 106 *Evaluation of the CARE Water Supply Program in Kenya.*

FR 107 *Evaluation of the Technical and Community Participation Approach of CARE-Assisted Rural Water Supply Project in Indonesia.*

FR 120 *Swaziland Rural Waterborne Disease Control Project: A Mid-Term Evaluation.*

FR 127 *Evaluation of the SEDRI/IEOS Rural Water Supply and Sanitation Program in Ecuador.*

FR 129 *Operation and Maintenance of Rural Drinking Water and Latrine Program in Honduras.*

FR 133 *A Study of the Problems of High Groundwater Levels in Nile Delta Villages.*

FR 134 *A Summary of the Progress Evaluation of the Rural Water Systems Environmental Sanitation Project—Peru.*

1985

FR 139 *Field Evaluation of Steel Fabricated Handpumps for the USAID/Dominican Republic Health Sector II Project.*

FR 154 *Plan for Evaluating Some Health Impacts of the USAID/CARE Community Water System Project in the Republic of Haiti.*

- FR 156 *Evaluation Plan for CARE and Government of Sierra Leone Rural Water Programs.*  
1986
- FR 162 *CARE/Bolivia Water Supply and Small Scale Irrigation Program: A Final Evaluation of the USAID-Financed Project.*
- FR 166 *Evaluation Plan for the Rural Water Supply and Sanitation Program within the Health Sector Loan II Project—Dominican Republic.*
- FR 169 *Evaluación del Proyecto de Agua y Saneamiento Rural en Honduras.*
- FR 182 *Evaluation of the Water Supply and Sanitation Component of the ADB-Sponsored Rural Health Services Project in Papua New Guinea.*
- FR 186 *Malawi Self-Help Rural Water Supply Program: Final Evaluation.*
- FR 191 *Final Evaluation USAID/Burkina Faso Rural Water Supply Project.*
- FR 197 *Small Rural Water Systems Project in the Yemen Arab Republic: A Midterm Evaluation.*  
1987
- FR 205 *Mid-Term Evaluation of the USAID/CARE Community Water System Project in the Republic of Haiti.*  
1988
- FR 201 *Final Evaluation of USAID/Catholic Relief Services Water and Sanitation Program in Ecuador, Peru, Guatemala, Honduras, and the Dominican Republic.*
- FR 227 *Evaluation of the CARE/Sudan Interim Water Supply and Management Project.*
- FR 228 *Final Evaluation of the USAID/Togo Rural Water Supply and Sanitation Project.*
- FR 250 *Evaluation of Operation and Maintenance Interventions: Cairo Sewerage I Project*  
1989
- FR 251 *Evaluation of the Environmental Component of the Community-Based Integrated Health and Nutrition Project in Guatemala.*
- FR 252 *Benin Rural Water Supply and Sanitation Project Mid-Term Evaluation.*
- FR 256 *Mid-Term Evaluation of the USAID/Tunisia Rural Potable Water Institutions Project.*
- FR 261 *Evaluation of the CARE Water Supply and Sanitation Project in the Dominican Republic.*
- FR 264 *Integrated Rural Health Delivery System—Ecuador, Final Evaluation.*
- FR 267 *An Evaluation of the Participatory Process in CARE/Rwanda Byumba Southeast Water Systems Project.*  
1990
- FR 294 *Final Evaluation of the Rural Water Systems and Environmental Sanitation Project, Peru.*
- FR 312 *Final Evaluation of the CARE/Bolivia Child Survival and Rural Sanitation Project.*
- FR 313 *Internal Evaluation of USAID Assistance to the Rural Water Supply and Sanitation Sector in Zaire.*
- FR 315 *Final Evaluation of the Bolivian Savings and Loan System Water and Sanitation Project.*
- FR 323 *Final Evaluation of PROCOSI, A Child Survival Private Voluntary Organization Network (La Paz, Bolivia).*  
1991
- FR 326 *Impacts and Lessons Learned from the Rural Water Borne Disease Control Project, Swaziland: A Ten-Year Retrospective.*

## ASSESSMENTS

1982

FR 33 *Environmental Health in Egypt: A Sectoral Assessment and Recommendations.*

1983

FR 75 *Formulation of the CARE Multi-Year Plan for Water Supply and Sanitation in Cameroon.*

FR 86 *An Assessment of the Water and Sanitation Sector in the Peace Corps Program: Role of the Office of Program Development.*

FR 104 *Assessment of the Environmental Sanitation Construction Component: Integrated Health and Systems Project in Guatemala.*

1985

FR 153 *Proposed Water Supply and Sanitation Strategies for the Ministry of Public Health in Thailand's Sixth Five-Year Plan, 1987-1991.*

FR 157 *Assessment of Save the Children Federation (USA) Rural Water Supply Systems and Training Needs in Nepal.*

1986

TR 35 *Assessment of the Operations and Maintenance Component of Water Supply Projects.*

1987

FR 206 *Mid-Term Evaluation of the CARE Water Supply and Sanitation Project in Belize.*

FR 215 *Privatization Study of the Village Water Supply and Sanitation (VWSS) Project, Lesotho.*

FR 217 *CARE/Sierra Leone Community Participation Assessment.*

1988

FR 258 *The USAID/CARE Community Water Project in Haiti: An Assessment of User Education.*

1990

FR 287 *Environmental Assessment: Water and Sanitation for Health and Ecuadorian Development (WASHED).*

FR 292 *Assessment of Solid Waste Management in Port-au-Prince, Haiti.*

FR 299 *Environmental Assessment of the Public Services Improvement Project Component III--Water Supply, Sanitation, and Health, El Salvador.*

1991

FR 331 *Cholera in Peru: A Rapid Assessment of the Country's Water and Sanitation Infrastructure and Its Role in the Epidemic.*

## Appendix B: The WASH Consortium

### Prime Contractor

**Camp Dresser & McKee International Inc. (CDM)**, Cambridge, Massachusetts, one of the largest consulting organizations in the United States, specializing in environmental engineering and related subjects. CDM, the WASH contractor, provides overall management of the project as well as expertise in technical and engineering areas.

### Subcontractors

**Associates in Rural Development (ARD)**, Burlington, Vermont, provides a range of services designed to promote the development of rural communities and improvement of life for rural inhabitants. In particular, ARD is dedicated to carrying out activities which are directed toward natural resource development in ways that ensure the future sustained use and conservation of these resources. The corporation has domestic and international experience and capability.

**International Science and Technology Institute, Inc. (ISTI)**, Washington, D.C., is a minority-owned, private, for-profit, consulting firm providing assistance to developing countries through technical, managerial, and financial expertise in the field of economic and social development. ISTI performs assignments for international agencies, governments, public institutions and private firms in the fields of private enterprise and economics; health, population, and nutrition; and agriculture and natural resources. Since its establishment in 1978, the firm has consistently provided experts with specific technical and language skills and geographic experience, fielding them in as little as two weeks from the time of request.

**Research Triangle Institute (RTI)**, Research Triangle Park, North Carolina, is a contract research organization established in 1958. RTI conducts applied and basic research in the United States and abroad for clients in government, industry, and public service. Major areas of training and expertise include social sciences; survey research; mathematics, statistics, and computer sciences; environmental sciences and engineering; chemical and biological sciences; and engineering and physics.

**Training Resources Group (TRG)**, Alexandria, Virginia, is a small business devoted exclusively to designing and implementing innovative approaches to human resources development. TRG is dedicated to making people and organizations work better. TRG provides service in organizational and institutional development, management training, training materials development, workshop design and delivery, and training of trainers. TRG serves a wide range of clients in both the public and private sectors.

**University of North Carolina (UNC)**, Chapel Hill, North Carolina, facilitates the development of international and cross-cultural research, consultation, and training in the field of public health, through its International Public Health Programs Office. The office also maintains and develops relationships with international assistance agencies and governments to promote the exchange of expertise and the establishment of collaborative research and demonstration projects.

**University Research Corporation (URC)**, Bethesda, Maryland, helps businesses and government clients solve tough problems through the application of innovative services and products. Through a variety of project efforts in operations research, family planning, basic health care, child survival, and improved management services, URC helps developing nations to establish, implement, and maintain the financial and management teams that are needed to assure quality services and a better life.

### **Associated Institutions**

**Two historically black educational institutions, Morehouse School of Medicine and Clark/Atlanta University (both located in Atlanta, Georgia), provide WASH with expertise in the field of health. Morehouse School of Medicine conducts research on health and provides special assistance on primary health care and vector control; Atlanta University conducts studies on the sociocultural aspects and economic benefits of water supply and sanitation.**