The UNDP-World Bank Water and Sanitation Program was organized as a joint endeavor of the United Nations Development Programme and the World Bank and has been one of the primary participants in worldwide efforts to meet the challenge of the International Drinking Water Supply and Sanitation Decade. The goal of the UNDP-World Bank Water and Sanitation Program is to bring basic water supply and sanitation services to those most in need in the developing world. Partners in this venture are the developing countries themselves and the multilateral and bilateral agencies that fund the Program's activities.

For further information on the Program or to obtain copies of UNDP-World Bank Water and Sanitation Program Discussion Papers and Reports contact:
Curt Carnemark, Chief
Water and Sanitation Division
Infrastructure and Urban Development Department
The World Bank
1818 H Street NW
Washington, D.C. 20433
USA
Erratum

The table on page 28 has been corrected to read as follows:

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<th>Contributions thru 12/90</th>
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<td><strong>GRAND TOTAL</strong></td>
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1. Includes contributions from India, Brazil, Tanzania, Malawi, and Nigeria.
2. Estimated

Note: Totals shown for bilateral and other donors differ from legal agreements because of exchange rates.
This annual review reports on the activities of the UNDP-World Bank Water and Sanitation Program during fiscal year 1990-91 (July through June). With the close of the International Drinking Water Supply and Sanitation Decade (the Decade), introspection and evaluation were called for. Hence, it has been an important year for the global campaign to improve the water and sanitation services of the poor in the developing world.

Through participation in the New Delhi “Global Consultation on Safe Water and Sanitation” and other end-of-decade forums, the Program made substantial contributions to shaping a global consensus on new directions in sector development. To build its own effectiveness, the Program also underwent an in-depth, forward looking independent assessment. Taking stock through these means and through intensive interchanges with colleagues, donor agencies, NGOs, and the Program Assessment Team has served to sharpen the Program’s objectives and directions for the future.

Unlike most annual reviews, this report—like the Assessment Report—is forward looking. In response to the rapid evolution of the sector, the Program must build on the past while being mindful of the future.

The Program has entered a period when its impact on national water and sanitation policies and on programs to reach the unserved poor is significant and growing. The first section of this report, therefore, profiles the Program’s global sector strategy for the first half of the 1990s—a strategy that aims to accelerate the provision of sustainable water and sanitation services in selected countries. (A more detailed description is found in Improving Services for the Poor: A Strategy for the 1990s.)

New Program initiatives are under way to strengthen and expand partnerships with governments, bilateral donors, multilateral banks, educational institutions, and nongovernmental and voluntary organizations. In response to the recommendations of the Assessment Team, an informal advisory panel of Program donors has been established to facilitate better interchange between management and donors, and to match donor resources
with Program initiatives. Similarly, at the regional level, the Program is setting up advisory committees and working with country representatives to help guide the work of the Regional Water and Sanitation Groups (RWSGs).

To incorporate program concepts and innovations into larger-scale projects, alliances are being built with the operational divisions of the World Bank and other multilateral banks. Likewise, the Program is forging new partnerships with groups at the grassroots level, such as the United Nations Volunteers, NGOs and other field-oriented organizations. These efforts, along with complementary initiatives aimed at capacity building and applied research, are outlined in the opening section of this report.

Four main thrusts are at the core of the Program's approach in the 1990s. They aim at developing human resources, promoting affordable technologies, ensuring a greater role for women, and identifying and promoting the institutional and financial options that work best in meeting the needs of the poor. These are the subjects of the four Program descriptions that follow.

A review of Program finances and a description of bilateral contributions to the Program make up the second section of this report, followed by accounts of Program activities during 1990-91, grouped according to regions.

These regional summaries describe the nuts and bolts of the Program’s worldwide network, profiling the most recent achievements of our RWSGs. From programs for innovative low-cost sanitation in West Africa to the start of a new International Training Network (ITN) center in Bangladesh, the work of our RWSGs cuts across the spectrum of national efforts aimed at more effective service delivery, taking special advantage of opportunities for both regional and global cooperation. A more detailed presentation of country-level strategies and the work planned by RWSGs can be found in UNDP-World Bank Water and Sanitation Program: Country Work Plan, 1991-92.

Formidable challenges confront the international development community in the 1990s—poverty alleviation, environmental protection, coping with rapid urbanization, and improving basic services for the rural and urban poor in the developing world. Drawing on the lessons of the past decade and building on new partnerships, the Program is working to expand sustainable water and sanitation services for the poor in over 40 countries, with a special focus on developing replicable programs in 15 to 20 countries of concentration.

Successful implementation of this strategy can set important precedents for the improvement and expansion of water and sanitation in other developing countries, and for other economic sectors. This process will require flexibility, innovation, and above all, cooperation among donor agencies, governments, participating communities, and the private sector. The Program stands willing and capable to assist.
Acronyms

ADB  Asian Development Bank
AfDB  African Development Bank
AIDIS  Asociación Interamericana de Ingeniería Sanitaria y Ambiental
AIHPh  All-India Institute of Hygiene and Public Health
AMREF  African Medical Research Foundation
BMZ  German Ministry for Economic Cooperation
BUET  Bangladesh University of Engineering Technology
CEPIS  Centro Panamericano de Ingeniería Sanitaria y Ciencias del Ambiente
CIDA  Canadian International Development Agency
CIEH  Comité Interáfricain d’Études Hydrauliques
CREPA  Centre régional pour l’eau potable et l’assainissement à faible coût
DANIDA  Danish International Development Agency
DGIP  Division for Global and Interregional Programmes, UNDP
DGIS  Directorate General for International Cooperation (the Netherlands)
EMENA  Europe, the Middle East, and North Africa
ESA  external support agency
FINNIDA  Finnish International Development Agency
GTZ  Deutsche Gesellschaft für Technische Zusammenarbeit
HRD  human resource development
IBRD  International Bank for Reconstruction and Development
IDA  International Development Association
INUWS  Water and Sanitation Division, Infrastructure and Urban Development Department, The World Bank
IRC  International Reference Center for Community Water Supply and Sanitation
IRC-WD  International Reference Center for Waste Disposal, Duebendorf
ITB  Institute of Technology, Bandung, Indonesia
ITN  International Training Network
KfW  Reconstruction Loan Corporation of the Federal Republic of Germany
LDC  less developed countries
LWUA  Local Water Utilities Administration (the Philippines)
NCO  national country officer
NETWAS  Network for Water and Sanitation
NGO  nongovernmental organization
NORAD  Norwegian Agency for International Development
ODA  Overseas Development Administration (United Kingdom)
PAHO  Pan American Health Organization
PAT  promotion of affordable technologies
PEPAS Regional Center for the Promotion of Environmental Planning and Applied Science, WHO
PROWWESS Promotion of the Role of Women in Water and Environmental Sanitation Services
RAF Regional Africa Bureau, UNDP
RAS Regional Bureau for Asia and the Pacific, UNDP
RUSAIFIYA acronym in Hausa (Nigeria) for water, sanitation, and health
RWSG-EA Regional Water and Sanitation Group, Eastern and Southern Africa
RWSG-EAP Regional Water and Sanitation Group, East Asia and the Pacific
RWSG-SA Regional Water and Sanitation Group, South Asia
RWSG-WA Regional Water and Sanitation Group, West Africa
RWSS rural water supply and sanitation
SDC Swiss Development Corporation
SDT sector development team
SIDA Swedish International Development Authority
SKAT Swiss Center for Appropriate Technology
SSAP sector strategy and action plan
TAG technical advisory group
TCDC technical cooperation among developing countries
TCWS Technical Centre for Water and Sanitation, Harare, Zimbabwe
UADE Union of African Water Suppliers
UNCDF United Nations Capital Development Fund
UNDP United Nations Development Programme
UNDTCD United Nations Department of Technical Cooperation for Development
UNICEF United Nations Children’s Fund
USAID United States Agency for International Development
UST University of Science and Technology, Kumasi, Ghana
VIP ventilated, improved pit latrine
VLOM village-level operation and maintenance
WASH Water and Sanitation for Health Project
WHO World Health Organization
WID women in development
WSSA Water Supply and Sewerage Authority (Ethiopia)
WSSLIC Water Supply and Sanitation for Low-Income Communities
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Millions of people, many of them children, die every year from water-related diseases. The poor suffer in ill health, in time wasted collecting water, in lost wages, and often in the high prices paid for inferior services. Improperly disposed garbage and human wastes are damaging water resources, particularly in the developing world, inflating the costs of water supplies and again hurting the poor. Burgeoning cities lacking adequate water and sanitation services have unhealthy citizens and a polluted environment, undermining their potential for sustainable development.
Improving water and sanitation services of the poor is a critical step in alleviating widespread poverty, in protecting our fragile environment, and in promoting human development. The key question is, how?

Many important lessons were learned from the successes as well as the failures of the Water and Sanitation Decade of the 1980s. Better technologies can bring down the cost of services and make them more reliable. Community-based approaches to service provision can empower users to become managers and owners. Levels of service and technology choices must respond to the demands of users rather than to arbitrary planning targets. Communities, private organizations, and businesses must be encouraged to participate actively. Governments must assume strong leadership in reforming policies and regulations to foster sustainable and environmentally sound sector development. And greater investment must be made in people to build the human and institutional capacities for sustainable services.
Developing countries made unprecedented progress in expanding sector services during the Decade. By the end of the 1980s, close to $10 billion was being directed into the water and sanitation sector each year, with nearly $3 billion supplied by external support agencies. Despite these commitments, the overall rate of service expansion barely kept pace with population growth, and in many developing countries there are more unserved people than ever.

To achieve full service coverage during the 1990s would require an estimated $350 billion, using a mix of conventional and low-cost approaches. Given current resource constraints, however, we cannot expect much more than $100 billion to be invested in water and sanitation projects and programs during this decade. To achieve greater advances, new investments in the sector must be designed to maximize the benefits for the unserved poor. Renewed efforts must focus on further reducing the costs of these services. And better approaches must be found to ensure the sustainability of water and sanitation infrastructure.
Since its inception in the late 1970s, the UNDP-World Bank Water and Sanitation Program—together with many partner agencies—has been a pioneer in the development of low-cost technologies and innovative service delivery systems.

- Drawing on more than a decade of experience in the developing world, the Program is prepared to play a key role in improving sector investments and national policies to reach more of the poor in the 1990s. Working closely with governments, donor institutions, and the private sector, the Program is pursuing a global strategy aimed at institutional and financial reform, essential human resources development, continuing improvements in low-cost technologies, enhanced roles for women, and better knowledge about effective approaches to sector development.

- Currently active in more than 40 developing countries in four regions, and focusing on a selected group of concentration countries, the Program is supporting a range of activities to strengthen national efforts for reaching the unserved poor. These activities include demonstration projects to test new hardware and organizational approaches; specialized training to enhance human and institutional capacities; formulation of national and regional sector strategies; applied research on technologies and policies; support to investment projects; assisting with donor aid coordination; and collaboration with nongovernmental groups and the private sector.

- To carry out this work, the Program will build on its foundation of expertise and a global field network supervised by the Regional Water and Sanitation Groups (RWSGs), backed by a small research and management corps at headquarters. This structure, with its combination of field operations and research, allows the Program to test and evaluate successful approaches, and apply them in operational programs in the developing world.
Based upon the requests of governments, the Program is prepared to assist in large-scale sector development activities in countries that meet criteria that help to ensure sustainable development. In broad terms, Program initiatives to the mid-1990s aim at:

- **Capacity building**—The Program assists countries in building their capacity to deliver services to the poor. This includes creating an enabling environment of legislation and policies, and strengthening institutions and human resources. The main capacity-building objectives are improving the performance of governments in sectoral planning and project implementation, strengthening and expanding the operations of the International Training Network, and promoting the adoption of the PROWESS approaches to community-level development.

- **Identifying new solutions**—To facilitate service extension, the Program is increasing efforts to identify improved approaches to sector development. The Program’s close linkages between operational activities and research benefit its key research objectives: improving the analysis of institutional, financial, and environmental resource constraints through stronger project monitoring and evaluation; and maintaining the pace of improvements in water, sanitation, and waste management technologies through field-based research and development.

- **Extending partnerships**—A broad range of talent and experience is needed to expand sustainable water and sanitation services. To provide the essential resources and expertise, the Program is building partnerships with governments, donor agencies, private organizations, and businesses at the national, regional, and international levels. Regional advisory boards will assist the work of the RWSGs, while a global advisory panel of donors will assist with long-range plans and Program finances.
Countries of Program Concentration: Selection Criteria

During FY1992-98 the Program will focus on “countries of concentration” selected according to:

- Official status as a less developed country (LDC) or IDA-eligible country, or presence of LDC-like conditions—extreme poverty—within a more developed country;

- Government commitment to concerted sector development, including creation of necessary enabling environment and allocation of adequate financial, institutional, and human resources;

- Commitment from external support agencies, including the World Bank and other multilateral banks, of necessary external financial resources;

- Availability of in-country financing for activities when required;

- Potential for substantial research and demonstration results pertinent regionally and globally.

Currently there are 11 such countries of concentration in which governments want to build a comprehensive program that incorporates most or all of the elements of the Program strategy. These are expected to grow to 18 as the Program expands activities in Latin America and the Middle East.

Major programs are under way or being planned in Bangladesh, Bolivia, China, Ethiopia, Ghana, India, Indonesia, Nigeria, Pakistan, Uganda, and Zimbabwe. Benin and Guinea, among others, will likely join the ranks in the next one to two years.

In other countries the Program undertakes targeted, time-limited activities on request by a government or by a key donor. Each of these activities must have the potential to yield significant and specific results without reference to other elements of the country program strategy. An example is a request for assistance in formulating a low-cost component of an investment project.
To achieve its objectives in the 1990s, the Program needs to be dynamic—continuing to develop a suitable structure and organization, to recruit capable staff, and to maintain a stable financial base. The structure put into place in 1988 has proven to be effective and will continue, with adjustments to respond to the updated strategy. The regional umbrella provided by the RWSGs has proven to be extremely responsive: country projects are planned as part of a regional strategy and approach, and the sustained inputs needed to support country activities are readily available.

The RWSGs will become even more important as the Program focuses on expanding services. RWSG staff will be a major source of expertise for planning and advising national programs and for investment project preparation. They will continue to exercise responsibility for planning regional and country activities in collaboration with UNDP, the World Bank, and other agencies. New RWSGs are also being planned. In Central America, a regional unit is emerging and will be based in Guatemala. Bolivia may become the location for a group serving neighboring countries in South America. Experts in human resource development and community development are being added to equip the RWSGs with capacity-building expertise.

The headquarters team will continue to manage the planning and monitoring of the Program, including financing, donor liaison, administration, and monitoring and coordinating activities among regions and with external agencies. PROWWESS, the International Training Network, and the Tech-

UNDP-World Bank Water and Sanitation Program: Countries of Activity by Region

![Map of the World showing the countries of activity for the UNDP-World Bank Water and Sanitation Program.]

Improving Services for the Poor in the 1990s
As highlighted in the Assessment Report, the UNDP-World Bank Water and Sanitation Program is an established international development partnership that will broaden its impact on sector development. Together with donor agencies and governments, it is applying the lessons learned in the 1980s to specific strategic development objectives in this decade. With the continuing support of donor agencies and the growing cooperation of developing country governments and NGOs, the Program is aiming at a new decade of achievement in improving the water and sanitation services of the poor.

UNDP has indicated that it will continue to support technical assistance in capacity building efforts and in-country preinvestment support. Bilateral agencies are expected to continue to help finance technical assistance and a share of the external investment needs. Support from the World Bank and other development banks will be sought for both sector work and project preparation, in addition to financing a significant portion of the investment needs. UNDP is planning its funding for core support (headquarters and regional activities) on a five-year basis to coincide with its own five-year cycle. With a minimum core level of support assured, the Program and its partners can engage in realistic long-term planning. In conjunction with this, establishment of a Program trust fund (with UNDP or the World Bank) is under consideration, with the oversight coming from the advisory panel of Program donors.
Activities

Interregional
- Program planning, management, and administration
- Coordination/backstopping
  - International Training Network
  - PROWWESS
  - Technology promotion and support
- Monitoring and evaluation
- Applied research
- Operational analysis and global synthesis
- Publications, information, dissemination, and exchange
- Donor liaison

Regional
- Regional and country strategies, objectives, and work plans
- Planning, management, monitoring of country-level programs
- Direct provision of country-level support (where no in-country project exists)
- Regional analysis, synthesis, and information exchange
- Regional/Country donor liaison

Country
- Sector advisory support
  - Policies, strategies, action plans
  - Investment programs
- Demonstration and pilot projects
- Implementation
  - Support to project preparation and implementation
  - Monitoring and evaluation
  - Capacity building
  - Human resource development and training
  - PROWWESS and community outreach
- Industrial and private sector support
- Donor liaison

Sources of Funds

Interregional
- UNDP Division for Global and Interregional Programs
- Bilaterals
- IBRD

Regional
- UNDP Regional Bureaus

Country
- Governments
- UNDP Country Programs
- Bilateral Country Funds
- Investment Banks
The Program’s strategy centers on four key thrusts in the 1990s: developing human resources, promoting affordable technologies, ensuring a greater role for communities—especially women—in sector development, and identifying and promoting the institutional and financial options that work best in meeting the needs of the poor.

Developing Human Resources

Human resource development (HRD)—strengthening local skills and capabilities—is vital to sustainable sector development. It entails building the capacity of community, private, and public organizations for sound and effective program development and project management. Last but not least, successful HRD involves generating awareness, concern, and participation among water and sanitation users.

Since its inception, the Program has stressed the relationship between HRD and successful sector development. In the many countries where the Program operates, however, the identification of HRD approaches in sector agencies is made complex by varying educational standards, recruitment policies, and remuneration levels.

In September 1990, the “Global Consultation for Safe Water and Sanitation” renewed the emphasis on key HRD challenges in the 1990s and placed it as a high priority for this decade. The Program Assessment Report likewise recommended giving high priority to HRD and endorsed the Program’s intention to boost HRD efforts in the years ahead.

Program HRD activities are varied, including counterpart and formal training, study tours, promotion of community participation and management, and education through the International Training Network for Water and Waste Management (ITN). Nine ITN centers presently link more than 40 affiliated institutions serving over 30 countries in Asia and Africa. Financial support comes from eight donors, while technical support comes from six specialist training centers in industrial countries. A comprehensive set of training materials on low-cost water and sanitation technologies and approaches provides core curricula to all cen-
International Training Network Centers

Established ITN Centers

Countries covered by Centers in Operation

Countries in which Centers are under Preparation

Improving Services for the Poor in the 1990s

Launched in 1984 with a mandate to broaden the training of national sector personnel in “conventional” delivery of water supply and sanitation systems, the ITN works to deliver such services to the poor by focusing on affordable approaches, many of which are low cost and community based. The ITN established a collaborative framework of local, regional, and international institutions to improve training, education, information dissemination, and local research.

By June 1991, nine core ITN centers are operational: three in East Asia (two in Indonesia and one in the Philippines), two in South Asia (India and Bangladesh), two in West Africa (Burkina Faso and Ghana), and two in East Africa (Kenya and Zimbabwe). Two centers in China are under preparation.

All training modules have been translated into English, French, and Spanish and some have been adapted in Arabic, Bahasa Indonesia, Chinese, and Portuguese.

Immediately following the New Delhi Consultation, the first ITN global meeting, held in Calcutta, brought the directors of the network centers together with their financial and technical supporters. The participants identified strategies for strengthening the network and providing greater outreach to support HRD in participating countries. To expand and strengthen the network, the Assessment Report noted that a coordination unit within Program headquarters is essential. Reflecting this emphasis, the Program has created a HRD group at headquarters to act as the coordination unit. (See diagram page 12.)
Zimbabwe: Providing a Quality Technical-Training Program

"Relevant, rigorous, and affordable," was Faustin Masanja’s commentary on the four-month Diploma Course at the Training Centre for Water and Sanitation (TCWS) in Harare, Zimbabwe. Mr. Masanja, from the Tanzanian Ministry of Water, Energy, and Minerals, was attracted to the course to gain further expertise in managing an extensive community water supply program in Tanzania’s western region. The course offered him relevant regional information and experience. Moreover, it cost one-quarter the price of a similar course in an industrial country.

The Diploma Course in Water Supply and Sanitation is part of a range of courses offered by the training center, a project of the University of Zimbabwe’s Department of Civil Engineering. The staff and equipment are provided by UNDP and the IBRD-Norwegian Trust Fund, while all operational and training activities are self-financing.

Established in 1989, TCWS exemplifies an ITN center in the early stages of development. Courses are targeted at government personnel, sector trainers, and engineering students. The annual curricula comprise a range of short courses, a four-month diploma course, and postgraduate training. Training activities are complemented by monitoring and evaluation exercises and by applied research projects. Staffed by highly regarded professionals, the training center has quickly built a reputation for practical classroom and on-site training, tailored to specific interest groups and focusing on affordable, sustainable, and community-based approaches. Demand is high. All of the center courses have been fully subscribed, and many could have been filled several times over.

The training center’s membership on the government’s National Action Committee forum on training and education positions it favorably to advise the government on human resource development issues. Regular collaboration with government and sector agencies, together with ongoing cooperation in training needs assessment, provides the basis for directing training activities. In 1990-91, the center focused much of its work on the needs of Zimbabwean sector personnel. In 1991-92, TCWS intends to reach out significantly to neighboring countries in Southern Africa, attracting more students like Faustin Masanja.

The impact of the ITN is evident as the more dynamic regional centers expand their activities, form national centers, prepare trainees, apply the knowledge of national sector specialists, produce local training materials, and conduct local applied research. These regional ITN centers offer developmental resources with worldwide connections that appear to be unique. And, increasingly they provide a conduit for the global dissemination of ideas, while retaining their regional specificity and high responsiveness to particular HRD demands.

In the coming year, the ITN will elaborate specific short-term strategies for the individual centers. The primary tasks, consistent with the Program Assessment, will be to strengthen the management of the existing network and ITN coordination. Further work focuses on laying the groundwork for sector expansion, including developing appropriate financing strategies, strengthening regional outreach, promoting the production of region-specific training materials, and consolidating research and information dissemination.

HRD is integral to the large-scale expansion of national sector activities—"scaling-up"—which is the fundamental Program objective of the 1990s. The sustainability of expanded programs can be assured only through building the capacity of local
institutions. Over the next decade, the ITN will expand and diversify its activities in countries where it is already active. In other areas where demands for appropriate sector training are high, it is intended to establish new ITN centers to stimulate the use of affordable technologies. The Middle East, North Africa, Portuguese-speaking Africa, and Central and South America are regions that are presently unserved by the ITN. Working with a range of sector institutions, the Program will help each region to develop an ITN presence.

The Program, moreover, is continuing to build its HRD support activities in parallel with the ITN. Several new publications and training modules are currently being produced in association with various training institutions. Two RWSGs have already recruited HRD specialists—and additional resources are being sought to enable the other RWSGs to follow suit.

Finally, the Program is now developing an overall strategy for involvement in HRD. Addressing the broad concerns of capacity-building and guiding the ITN in its longer-term evolution, the strategy will ensure that institutions derive the full benefits of training inputs. Working in collaboration with universities, donors, NGOs, and other training institutions, the Program is assisting in the development of human resources of the sector with a specific emphasis on managers and technicians trained to increase the access of the poor to appropriate, low-cost, community-based water and sanitation facilities.
Promoting Affordable Technologies

The expansion of water and sanitation services in the developing world is often constrained by a lack of financial resources, particularly for services targeting the poor. Promotion of affordable technologies (PAT) is critical to meeting these basic needs. For more than a decade, the Program has assisted developing countries in adopting low-cost, community-based systems on a large scale. Activities have been concentrated mainly in the area of rural water supply and sanitation (RWSS) where “appropriate” solutions are relatively inexpensive, socially acceptable, and sustainable by the communities themselves. In the poor urban areas where the Program works to address the problems of waste disposal, different technologies are sometimes called for, but they must still be affordable, institutionally sustainable, and environmentally sound.

Initial Program research centered on the technical aspects of handpumps and household latrines, on the institutional setting for application of these technologies, and on local manufacturing. While this work will continue, the Program will also tackle other factors that influence the cost and viability of water and sanitation systems. Examples include drilling methods and equipment that can reduce borehole costs, sanitation facilities that can be upgraded, simplified sewerage, low-cost equipment for solid waste management, and promoting other innovations emerging out of the Program’s involvement in the sector.

Since the beginning of the 1980s, activities have focused on technologies that are suitable to the vast numbers of unserved poor, such as VLOM (village-level operation and maintenance) handpumps and viable on-site sanitation. The results include the Afridev handpump for deep groundwater, and the less-expensive Tara direct-
action handpump for shallow and medium-depth groundwater, improved VIP latrine designs, modified pour-flush latrines, and simplified sewerage concepts. In collaboration with other research organizations, moreover, the Program has been contributing to the refinement of VIP latrines, rainwater cistern systems, the India Mark II, III, and IV handpumps, and the “condominial” sewerage system. Program research also established the economic rationale for resource-recovery approaches to waste management, including the promotion of approaches that can turn a poor community’s waste disposal problem into an income-generating business that can reduce the quantity of wastes.

By the mid-1980s, the Program’s focus broadened to cover three types of technology-promotion activities: demonstration of technologies and systems, training, and PAT. These activities included adoption of the VLOM concept at the national level and promoted local handpump manufacturing capacity and quality control systems. In demonstrating these technologies, the Program has gained the experience to sharpen its focus on community-based approaches.

The Program’s work in PAT has been successful, and there are several compelling reasons for continuing the technology research, development, and promotion activities of the Program into the 1990s:

- Many critical technology gaps exist where little research and development work has been done or where only limited promotion has been undertaken. Gaps in the market availability of water supply and sanitation components for low-income groups need to be assessed so that actions can be taken to close them. Governments have to be persuaded to adopt strategies that encourage the efficiency of the private sector, including manufacturers. In cases where the private sector is not involved, the Program will support new research and development, testing, and promotion in order to evaluate and define specific low-cost technologies.

- There is a need to upgrade services and technology in communities that have benefited from initial improvements.

- Where user communities are vulnerable to operation and maintenance problems, there may be a need to encourage standardization of hardware. Support in this area will be aimed at facilitating both an adequate supply of spare parts and suitable training of technicians and operators.

- There remains a strong need for continuing support both for North-South technical exchanges as well as for specific regional arrangements within the framework of TCDC (technical cooperation among developing countries).

The cost of services continues to be a critical factor in sector planning and development. In recent years, many regions have promoted greater decentralization, which significantly affects sector planning and systems operation and maintenance. The emergence of community-based approaches has highlighted the need for community selection of technologies.

While the Program has achieved considerable success in VLOM water supply systems, much work remains to be done in VLOM-type sanitation and waste management systems.

The initiative of the private entrepreneur in creating new technologies needs to be encouraged. Government tariffs, duties, and customs provide the incentives (or disincentives) for local manufacturing or external supply, as appropriate, of low-
cost hardware essential to sustainable services. The Program will continue to promote the conditions needed for a competitive economic environment and assist in the creation of the institutional and administrative setting that encourages greater private sector participation.

As in the past, the Program will assist in the development of new ideas and technologies that do not involve issues of invention registration, copyrights, and ownership of intellectual properties. Through demonstration, training, and information dissemination, the Program is encouraging in-country sector personnel to adapt, modify, and improve current technologies. Care is taken to ensure that the provision of support for product development is not construed as endorsement of specific products.

Two areas are currently being assessed to define more precisely the Program's affordable technology strategy. First, a critical look at the past five years of PAT activities is under way. The analysis is reexamining the rationale, objectives, and need for support to local manufacturers. The aim is to define an approach that encourages market forces to develop and manufacture quality products. Second, after 10 years of development the VLOM concept will be revisited. With the objective of substantiating its validity and benefits, this study is reviewing examples of VLOM impacts at the village and national levels where it has been applied and accepted.

The Program will continue to promote affordable technologies through several other important initiatives:

- Encouraging governments to reform policies, incentives, sector management, and financing to promote affordable technologies;
- Continuing with its Technology Promotion Facility, launched in December 1990 with DGIP financing, to support the demonstration of new low-cost technology innovations; and
- Ongoing monitoring of performance and further development of proven technologies.
Identifying New Solutions

During the past year, the Program linked its applied research work with that of the Policy Unit of the Water and Sanitation Division of the World Bank. Such a realignment now facilitates research by Program staff in conjunction with the country operations divisions of the Bank as well as RWSGs and other donors. Research emphasizes ways of strengthening institutions to improve policies and enhance overall sector performance. Currently, Program staff conduct applied research organized into two broad areas: institutions and urban environmental sanitation. This research examines new institutional options, financing of sector activities to reach the poor, promoting the role of women in the sector, the effects of sector development on the environment, and human resources requirements of the sector. In conjunction with the Policy Unit, the Program also carries out research on water resources to the extent such issues affect the poor. Problems created by rapid urbanization form a theme cutting across all research.

Institutions

The research agenda reflects a growing awareness that the sector is not performing well in providing sustainable services, and that institutional deficiencies are a prime cause of poor performance. During the past year, Program and policy staff began to examine how various organizational arrangements and institutional “rules of the game” influence the delivery of water supply and sanitation services. One of the key issues is to determine ways to make central government planning and funding allocations more responsive to local-level demands for services. Research is analyzing transaction costs and the role of incentives and accountability in improving performance. Improved analysis of regulations and systematic evaluation of consumer responses provide a basis for new incen-
Ivatives to promote better performance and enhance accountability.

**Private participation.** Water supply and sanitation services are generally provided through the public sector. But the private sector has been shown to be a viable and effective option for service delivery in many circumstances. Research is under way to identify where and how private services work best and, where possible, to compare the institutional costs associated with several types of public and private urban water supply systems. The research is identifying factors likely to minimize institutional costs, including the characteristics of regulatory institutions, the legal framework, and elements of the broader institutional environment. Such information should make it possible to account for institutional costs in designing arrangements with the private sector and to plan institutional reforms in the public sector for greater efficiency.

**Institutions for urban sanitation.** Research in urban sanitation is developing a methodology to measure the costs of institutional inefficiencies and the benefits of remedial measures. The methodology develops performance indicators that identify and help correct deficiencies in the planning of sanitation projects and computes the institutional costs of inefficiencies during project implementation and service delivery. This research is planned for inclusion with World Bank and Program projects in Indonesia, Brazil, and Bangladesh. The results should lead to simple monitoring and evaluation criteria and indicators that improve performance in the planning, implementation, and operation of urban and periurban sanitation projects.

**Household response to unreliable services.** Households faced with inadequate or unreliable water supply necessarily adopt coping strategies. The research group is examining these strategies to assess their relative effects on efficiency of water provision and the distribution of benefits from water use. In addition, the household costs of the coping strategies will be compared with the costs of improving the adequacy and reliability of the services. Fieldwork has commenced in India and will continue in Indonesia and Bangladesh.

**Popular participation.** Participation in the planning, implementation, and evaluation of water and sanitation programs varies in form and intensity. It ranges from simply sharing information with government bodies to community control of assets. Program research on popular participation aims to analyze the effectiveness of different types of participation in improving rural water supply and sanitation services to the poor. The results should form a basis for designing better projects.

**Rural water supply.** Effective management of rural water supplies requires strong and responsive local organizations. The Program's research focuses on finding what type of institutional arrangements work best. Community characteristics and some factors in the broader institutional environment favor specific delivery options. Accordingly, research is under way to identify and analyze the conditions best suited for each delivery arrangement, such as self-provision, community management, or local government control and provision of services.

**Urban Sanitation**

The Program is also undertaking additional investigations related to the provision of urban sanitation services.

**Strategic sanitation planning.** One of the challenges facing the developing countries today is how to meet the growing needs for urban sanitation services in the face of declining resources. The Program has been developing a strategic sanitation planning process, aimed at improving efficiency and sustainability in the delivery of urban
sanitation services. Reorienting service responses toward demand is central to this process. Demand orientation means that key decisions in the planning process (such as allocation of resources, the choice of beneficiaries, technology types, and tariff levels) are based primarily on current and expected demand as expressed by how much the target groups are willing to pay for the technologies they want. Consumer preferences should receive first consideration and be given significant weight in planning investments.

This innovative planning process has been used in the preparation of a plan for sanitation in Kumasi, Ghana, and is being applied also in the preparation of a similar plan in Ouagadougou, Burkina Faso. Preliminary research on the planning of urban sanitation projects was completed during the past year, and details of the results are being reviewed for publication. This research includes willingness-to-pay studies, analysis of technology choice among alternative technologies with variable costs, and exploration of financial and institutional issues in implementing strategic sanitation planning. The process will be further refined through research in Brazil, Bangladesh, and India.

**Water Resources**

**Water resource management.** Many cities in the developing world face growing shortages of water, falling groundwater tables, land subsidence, and water pollution. As domestic, industrial, and agricultural water users compete for increasingly limited supplies, the cost of water rises for everyone, especially the poor. A multicountry research project has been initiated to evaluate policy instruments for encouraging conservation, reducing water pollution, and improving the allocation of water among competing users. This work will estimate the potential benefits of changing current regimes, practices, and rules on sectoral allocation of water. The studies will test how specific regulations governing activities such as groundwater extraction, pollution, and water allocation, along with economic incentives, will increase water availability and hold down the costs of urban water supplies, particularly for communities on the urban fringe. It will also evaluate the likely costs and benefits of these policies under different ecological, developmental, and institutional settings with a focus on minimizing the effects of scarce water resources on the poor. Parts of the research that pertain to wastewater reuse and the reliability of water supply are being conducted in collaboration with the RWSGs, which are assisting in the selection of case studies.
Opening New Horizons for Women

Throughout most of the developing world, women are the custodians of water for their families. For them, an improvement in the source and quality of water brings better health and saves time and labor.

Achievement of one of the Program's primary objectives—promoting the role of women in water supply and sanitation—is critical if the quality of life of the poor is to be improved. There is clear evidence that it is not sufficient simply to supply improved water and sanitation. Women must also participate in the process of provision so that they shape what, how, and where new facilities are provided.

If women are to assume a greater role in water and sanitation improvements, opportunities and incentives for their participation must be created. Program planning, management, and evaluation must foster this goal by design, targeting women's involvement as a fundamental project objective. The participation of women is a major focus of the PROWWESS program. Launched in 1983, PROWWESS has concentrated on the development of participatory approaches to planning and evaluation, and building national capacities that include women's participation in the sector.

To accelerate this process, PROWWESS and the UNDP-World Bank Water and Sanitation Program have instituted a new partnership. The PROWWESS senior planning and evaluation officer joined the Program in September 1990 as the PROWWESS coordinator. In addition, a PROWWESS adviser began work in the RWSG-EA in Nairobi, serving Program activities in Zimbabwe, Tanzania, Ethiopia, and Kenya. At the same time, the PROWWESS Africa Coordinator based in Abidjan, Côte d'Ivoire, promotes partici-
patory training methods in Burkina Faso, Mali, Senegal, Ghana, and Nigeria. PROWWESS staff also support Program activities by examining the role of local governments in the expansion of services, working with ITN centers to promote human resource development, forming evaluation guidelines for use at the local level, and identifying and refining extension strategies.

PROWWESS has focused primarily on community-based, rural water supply and sanitation

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**Targeting Benefits in Poor Communities**

To gather information for the design of an urban investment program in Chittagong, Bangladesh, INUWS and RWSG-SA staff used rapid appraisal methods to survey the slums and squatter settlements. Over a three-week period in mid-1990, a multi-disciplinary team observed the use of water sources, communal latrines and street hydrants, made ethnographic surveys of low-income areas, and held participatory meetings in poor neighborhoods.

To respond more effectively to the varying needs for improved water supply and sanitation, the appraisal team assessed differences between needs and preferences of men and women, their willingness to pay for improvements, and their patterns of water utilization. By identifying differences in capabilities and potential contributions of different groups in a gender-specific manner, the team was better able to understand the measures required to alleviate the difficulties confronted by poor households in the slums and squatter settlements.

The appraisal revealed that the slums and squatter communities suffer from low and irregular coverage of water supply, acute unsanitary conditions, inadequacy of the waste management system, and weak institutional structures. Some communities rely on a single source of water, such as an open well, while others rely on standposts, handpumps, ponds, drains, and other sources of surface water.

Men have greater access to standposts as their water source, but women most often use handpump sites because the standposts are often crowded and lack privacy. While currently there are no charges for standpost water, handpumps must be obtained and paid for privately. The effect is that public subsidies disproportionately benefit men. The study concluded that increased support for handpumps may provide an economical solution to the water supply problem in Chittagong slums, while specifically benefiting women.

Women in the squatter settlements often feel incapable of bringing about positive change in the slum communities through political participation. For targeting the needs of women, the study recommended an indirect approach to making policy decisions that could result in practical, beneficial improvements in the provision of water and sanitation for the poor. These policy decisions cover a range of options, including subsidies, choices in type, siting, level of service, and the extension of credit.

Direct interventions are also possible in successful targeting of poor women. This approach promotes education and expanded opportunities for women, including improved water supply and sanitation in girls’ schools, broadening the employment and scholarship opportunities for women within the sector, and improving extension training in health and domestic hygiene for poorly educated women.
programs, where accurate information on people’s needs and priorities is critical to success. To gather such data, PROWWESS develops participatory methods that minimize data gathering and provide timely information. When local people join this process, the time they invest builds a commitment to develop facilities that their community is more likely to support.

Communities in Bamako, Mali, benefited from using participatory data collection techniques when PROWWESS worked with city officials to design a responsive city garbage collection system, one part of an urban solid waste management project. In the slums of Chittagong, Bangladesh, squatters also participated in a rapid urban appraisal that used participatory approaches to determine the scale of improvements needed in water and sanitation services.

In the 1990s, PROWWESS faces a major challenge: to incorporate participatory approaches into the ongoing and new large-scale programs that are needed. PROWWESS will continue to emphasize people’s participation—especially that of women—while analyzing the experience in countries of concentration to form the basis for expansion of coverage. Lessons will be drawn systematically from these new large-scale programs by designing into them research and monitoring procedures.

Several issues of critical importance in sustaining large-scale programs will be addressed in the future. To support demand responsiveness in large-scale programs and women’s access to finance—both often essential to the design of sustainable facilities—PROWWESS will test means, such as credit, grants, and enterprise development, to disburse money in response to community needs. PROWWESS will also focus on the adaptation of mass communication techniques to support people-centered development and the strengthening of NGO support to the sector.

Strong foundations for the large-scale expansion have been laid, and PROWWESS will begin establishing formal partnerships with agencies in the sector. Through the ITN system, PROWWESS has started to identify how to deliver the capacity for community involvement that is essential to large-scale programs. The ITN centers are participating directly: for example, the center in Zimbabwe is producing guidelines on participatory evaluation methods for district officers.

It is impossible to undertake large-scale training efforts without adequate training materials. To date, PROWWESS has published *Tools for Community Participation*, providing trainers with ideas and new tools to help extension workers forge effective working partnerships with village people. Available currently in English, it is being translated into Spanish, French, and Portuguese. To strengthen the links between communities and their sector institutions, PROWWESS is preparing additional training materials to address needs at the grassroots.

Skilled trainers are needed, and there is an acute shortage of such qualified teachers in the developing world, especially in Africa. In response, PROWWESS has started to build a network of skilled trainers in Africa by sponsoring regional, national, and local workshops. Each workshop adapts training techniques and materials to the local context, and these are refined through field use.

The effectiveness of PROWWESS training methods and participatory approaches is gaining wide recognition among policy makers. Following a request at the Collaborative Council meeting in Nice in 1989, PROWWESS developed a monitoring and evaluation system to measure system sustainability, effective use, and replicability. The system was presented to the Global Consultation in New Delhi, which also endorsed it and incorporated it in the New Delhi Statement. As a result, several bilateral aid agencies have begun to incorporate the system’s core indicators into their projects.
Program Structure

The Program is managed by the Water and Sanitation Division of the World Bank’s Infrastructure and Urban Development Department. Activities at Program headquarters in Washington, D.C., include global monitoring of projects, coordination of field activities, conducting applied research, information dissemination, and administration. Program activities in South America and the Arab States is currently being explored. Special efforts are currently under way to strengthen the mix of skills within the present RWSGs, especially in human resource development.

Four regional water and sanitation groups (RWSGs) directly manage all field activities and serve as a source of technical assistance for governments and other external support agencies. Located in Abidjan, Nairobi, New Delhi, and Jakarta, the RWSGs are headed by regional managers and staffed by multidisciplinary teams of experts. In countries of Program concentration, national teams have been recruited and country coordinators posted. Following a collaborative mission with UNICEF, USAID/WASH, PAHO, and WHO to four countries in Central America, the Program is joining with other agencies to establish a new regional group based in Guatemala.

During 1990-91, headquarters was restructured to provide better links to field operations and to strengthen activities. The Water and Sanitation Policy Unit was given responsibility for supervision of Program research, policy analysis, and information management. To strengthen the relationship between the Program and the International Training Network, a new human resources group was created in Washington, D.C., and began operating in July 1991. Similarly, to strengthen the Program’s role in promoting community participation, a PROWWESS group was formed in head-
quarters in September 1990. Through closer coordination at headquarters, the productive efforts of the ITN will be multiplied as a result of collaboration with PROWWESS and other initiatives to build human resources.

**Program Financing and Allocations**

The Program has developed a base of financial support that is well suited to its global structure and diverse field activities. UNDP and the World Bank are the Program’s two managing partners, with support from UNDP accounting for the single largest source of funds. During 1990-91, UNDP provided almost 70 percent of the $11.7 million utilized by the Program. These funds came principally from UNDP’s Division for Global and Interregional Programmes (DGIP), the Regional

### Cumulative Funding for the Water and Sanitation Program (US$000)

<table>
<thead>
<tr>
<th>Contributions thru 12/90</th>
<th>Disbursements thru 12/90</th>
<th>Disbursements in 1990</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNDP:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global</td>
<td>5,194</td>
<td>5,157</td>
</tr>
<tr>
<td>Interregional</td>
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<td>23,108</td>
</tr>
<tr>
<td>Regional Africa</td>
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<td>7,877</td>
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<tr>
<td>Asia</td>
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<td>1,274</td>
</tr>
<tr>
<td>Regional Europe</td>
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<td>94</td>
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<tr>
<td>Latin America and the Caribbean</td>
<td>615</td>
<td>176</td>
</tr>
<tr>
<td>Regional Arab States</td>
<td>575</td>
<td>145</td>
</tr>
<tr>
<td>Country Projects</td>
<td>15,635</td>
<td>9,201</td>
</tr>
<tr>
<td><strong>UNDP Subtotal</strong></td>
<td>57,461</td>
<td>8,119</td>
</tr>
</tbody>
</table>

| **Bilateral Agencies:** |                          |                       |
| Canada                  | 3,246                    | 3,000                 | 133       |
| Denmark                 | 1,010                    | 546                   | 137       |
| Finland                 | 764                      | 680                   | 146       |
| France                  | 862                      | 809                   | 0         |
| Germany                 | 2,466                    | 2,138                 | 99        |
| Italy                   | 300                      | 300                   | 0         |
| The Netherlands         | 6,635                    | 830                   | 699       |
| Norway                  | 7,086                    | 4,153                 | 1,226     |
| Switzerland             | 4,785                    | 2,954                 | 368       |
| United Kingdom          | 826                      | 572                   | 99        |
| **Bilateral Agencies Subtotal** | 27,980                  | 2,907                 | 15,982    |
| Others: ¹                | 1,757                    | 1,435                 | 125       |
| Management Support      | 3,151¹                   | 3,151¹                | 575       |
| **GRAND TOTAL**         | 90,349¹                  | 67,600                | 11,726    |

1. Includes contributions from India, Brazil, Tanzania, Malawi, and Nigeria.
2. Estimated

*Note:* Totals shown for bilateral and other donors differ from legal agreements because of exchange rates.

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28 Program Structure
Bureau for Africa (RAF), and from UNDP country program funds in 14 countries in Africa and Asia. Smaller amounts were provided by two other UNDP regional bureaus: Latin American and Caribbean, and Arab States and Europe. Contributions of almost $3 million from nine bilateral aid organizations made up fully one-quarter of the Program’s budget. About five percent of the total was provided by the World Bank for management support.

Most countries where the Program is active make substantial contributions, usually as in-kind inputs such as national staff, office space, and other support. Some host governments make direct cash contributions, as is the case in Nigeria where both the federal government and five state governments are supplementing UNDP and Dutch project funds from their own resources. Increasingly, as projects are better planned funds are being generated locally from project beneficiaries.

**Allocation of Program Funds**

Funds support activities in more than 40 countries, in the four RWSGs, and at the Washington, D.C. headquarters. There are three main types: in-country activities in India and Zimbabwe as components of interregional project INT/87/014. The regional core funds also support the exchange of knowledge and experience between neighboring countries and, through the RWSGs, permit the Program to operate more efficiently from a regional base close to participating countries.
In Africa, the Program has received substantial core funding from UNDP, which has supported the Abidjan and Nairobi RWSGs over the past three years. This core financing, which averages about two million dollars a year, has been instrumental in building both the regional and country operations. It has also leveraged substantial amounts of bilateral financing, both for regional core operations (more than one million dollars yearly) and for in-country operations.

In Asia, DGIP has provided regional core financing, and four bilaterals (Denmark, Norway, Switzerland, United Kingdom) have supported specialists working in the RWSGs. UNDP’s Regional Bureau for Asia and the Pacific (RAS) has supported the Water and Sanitation Sector Development Team (SDT), managed by the World Bank’s Asia Technical Department, and focused on improving the operations of urban utilities. It has been agreed between UNDP and the World Bank that the RWSGs and the SDT will be merged during the next Program cycle.

In Latin America and the Caribbean, funding to develop in-country and regional activities has come primarily from DGIP. A special UNDP fund for economic integration is now helping to finance a regional water and sanitation network in Central America. In South America, UNDP’s Latin America and Caribbean Bureau will provide preparatory assistance funds for a similar initiative starting in 1992. In Europe and the Arab States, UNDP’s Regional Bureau has financed several multicountry resource recovery and training projects and is exploring the possibility of a similar network for North Africa.

**Priority Regions**

The global allocation of funds (in-country and regional core) reflects the Program’s priorities in targeting the poor. Africa, with its large population of unserved rural poor, is the first priority, receiving more than two-thirds of the Program’s resources. Asia, the second priority, receives about a quarter. These priorities will remain the same.
over the next five years, although the percentage of Program resources devoted to Africa is expected to diminish to some degree as new activities in the other three regions become fully operational.

The Interregional Core

The interregional core funds support the regional umbrella organization and unify the global program, providing the central supervision for the four regional offices and more than 40 country operations and activities. Interregional core funds support staff and activities located primarily in Washington, D.C., and concerned with the overall planning, management, and administration of the Program. Interregional core funds provide for staff involved in global coordination and support to the field operations, the ITN, and PROWWESS. The funds also allow the Program to conduct applied research, synthesizing the results of its global experience and disseminating information, all of which combines to leverage sector investment.

DGIP continues to provide most of the funds for the interregional core. The World Bank contributes about $600,000 per year in management support costs. Several bilaterals, notably Norway and Switzerland, also contribute to the support of core interregional functions.

Range of Program Activities

The Program's country-level activities include sector advisory support, demonstration and pilot projects, investment project support, human resource development and training (the ITN and PROWWESS, among other initiatives), and promotion of affordable technologies and collaboration with the private sector. Interregional activities involve applied research, global synthesis, and dissemination and exchange of information.

Sector advisory support—helping countries to build an enabling environment for develop-

ment—and demonstration activities utilize the largest percentage of Program resources. Over the next few years, some staff resources directed to these two areas will shift toward new areas as the Program increases its emphasis on capacity building and on applied research and global synthesis.

Financing for the Future

The diversity of Program funding sources and mechanisms adds complexity to financial planning, monitoring, and reporting to donors. The Program Assessment Report recommended two key measures to simplify the financial support and management of the Program. First, consolidation of UNDP support into a rolling five-year "indicative planning subvention" can assure minimum levels of funding for planning and staffing purposes. It can also simplify financial management by reducing the number of separate projects. Second, the establishment of an advisory body will provide a regular forum for analysis of financing
needs and review of Program expenditures. Donors will have the opportunity to consider their contributions in the context of an overall Program financing strategy, and the Program will need to make fewer contacts with individual donors.

In addition to acting on these recommendations, the Program is pursuing several other routes to a simpler and more stable funding process. A Program trust fund will be established to receive financial contributions. To the extent possible, these contributions should not be tied to specific activities but directed instead to overall Program support, with oversight coming from the Program advisory body.

Future Program support will be tailored to contributing agencies' comparative advantages. The Program's dual objectives of service expansion and finding new approaches to reaching the poor are complementary to UNDP's preinvestment mandate and its position as a major source of technical assistance. UNDP support will be concentrated on core support at the regional and headquarters levels and on project-level financing for country programs. As the other managing partner, the World Bank will utilize the leverage provided by the Program in the form of operational staff time for the preparation of projects targeting the poor and as substantial investment financing for these projects. Bilateral agencies have proven to be responsive in financing a broad range of Program activities and appear committed to continuing that approach. Bilateral contributions are especially important in supplementing regional core operations and in funding country activities, capacity-building initiatives, and selective applied research tasks.

New Projects in FY91

Five new UNDP country projects were approved in FY90-91:

- Management and Decentralization of Water Supply and Sewerage Authority in Ethiopia (ETH/90/010). Budget: $659,000
- Establishment of Federal Water Supply and Sanitation Sector Support Unit in Pakistan (PAK/90/013). Budget: $536,000
- Strategic Sanitation Plan for Ouagadougou, Burkina Faso (BKF/89/016). Budget: $300,000
- Potosi Rural Water Supply and Sanitation, Bolivia (BOL/90/004). Budget: $2,805,108 fully funded by the Dutch government
- Strengthening of Planning Capacity and Economic Management in Madagascar (MAG/89/001, executed by UNDP). Budget (through interagency agreement): $277,200

During 1990-91 four bilateral agencies approved new contributions to the Program:

- Switzerland approved a new 30-month (beginning October 1990) $1.645 million framework agreement to finance a series of activities throughout the world.
- Canada approved a country focus contribution agreement totalling $296,700 to support a social scientist in the East Africa RWSG for approximately two years.
- Denmark has placed a sector planning engineer in the South Asia RWSG for an initial two-year period through an agreement totaling $391,000.
- Norway has agreed to add about $900,000 to the $4.5 million trust fund established in December 1988 and to extend the period of time through 1992.
Bilateral Sponsors

Bilateral contributions form an effective complement to support provided by UNDP. Bilateral sponsors directly support the Program’s regional operations through the placement of staff and funding of operational costs. In country programs, bilateral support provides for demonstration and pilot projects and maintains the active presence of most of the International Training Network centers.

Ten bilateral donors have given direct cash contributions to the Program: Canada, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Switzerland, and the United Kingdom; Sweden has provided cash support through other means. As described below, this group of bilateral donors has also provided millions of additional dollars of indirect support to Program activities. Eight of these donor countries had active projects with the Program during FY90-91.

Canada

Through the Canadian International Development Agency (CIDA), Canada has contributed $3.3 million to the Program through 1990. A new country-focus agreement for East Africa was approved in late 1990, through which CIDA has added support for a social scientist with the RWSG-EA staff. CIDA has financed long-term projects in Bangladesh and Ghana, both of which should have substantial influence on low-cost water supply and sanitation programs beyond the borders of those countries.

From the CIDA-financed work in Bangladesh comes a clear example of effective use of sustained services. In Mirzapur, the Program conducted a study of an integrated project comprising
handpumps, latrines, and hygiene education. Handpumps and improved latrines (twin-pit pour-flush models) were provided along with an extensive hygiene education program that included household visits, group discussions, and training. Care was taken that the services provided were what the future beneficiaries wanted, and that they were willing to finance part of the cost. Behavior in the project and a control area was monitored over four years. In the project area, services were maintained and, as a result, most household water came from the handpumps and most adults used latrines. Behavioral changes also led to improved hygiene habits. Relative to the control area, there was significantly and substantially less diarrhea of all kinds, in each village, in all seasons, in each year, and for all children over six months of age. The project has now been completed and the results were published and disseminated widely in late 1990 in *Water Supply, Sanitation and Hygiene Education: Report of a Health Impact Study in Mirzapur, Bangladesh*.

In Ghana, what began in Bolgatanga as a handpump field trial in 1983 has, since 1988, become a demonstration of community-managed rural water supply. The project has established community management, trained local mechanics, and promoted hygiene education and latrine construction. The Bolgatanga experience served as an important input into the development of a rural water supply and sanitation strategy for Ghana. The strategy was endorsed at a donors' conference held in February 1991 and will form the framework for new donor-supported projects in rural areas in the next few years. The Bolgatanga project itself has now been completed.

CIDA, along with SDC, has been financing the activities of CREPA, the regional training network center based in Ouagadougou, which serves francophone Africa. CREPA has started on a second phase of work, which is expected to be linked more closely with Program activities in francophone countries.

**Denmark**

Over the past few years, collaboration between DANIDA (the Danish International Development Agency) and the Program has grown from its beginnings in East Africa to include South Asia. DANIDA's direct contributions approved through 1990 totaled $1 million.

In January 1991 DANIDA placed a sector planning engineer in the South Asia RWSG in New Delhi to work in countries in the region for an initial two-year period. In India, the RWSG has provided technical support to DANIDA-assisted rural water supply and sanitation projects in Tamil Nadu and Karnataka.

The proposal for an ITN center at the Bangladesh University of Engineering and Technology (BUET) was appraised in late 1990. DANIDA has agreed to finance the establishment of the center ($0.8 million) and government approval has been obtained; DANIDA will also fund an expatriate adviser and associated institution services through the Danish University of Aalborg.
The start-up phase should begin in the next year, and full operation is expected by early 1992.

In Uganda, DANIDA is supporting a water and sanitation adviser in the Ministry of Water and Mineral Development, who is collaborating closely with the Program. And in Ghana, where the Program has been active in preparing a rural water supply and sanitation strategy, DANIDA is expected to finance a major part of the government’s rural water supply and sanitation investment program.

**Finland**

The Finnish International Development Agency (FINNIDA) has contributed about $0.8 million to the Program, primarily for activities in East Africa. Beginning in 1988, FINNIDA financed a sector planning engineer post in the East Africa RWSG to work in a number of countries in the region. This three-year assignment was completed in September 1991 and FINNIDA has agreed in principle to continue support of the post.

FINNIDA financed a study carried out by Tampere University on the development of rural water supplies in Finland, as part of the Program’s investigation of broad principles applicable to rural water supply development. The final report will be published by end-1991.

In Sri Lanka, the RWSG-SA assisted in the evaluation and appraisal mission for the FINNIDA-assisted Kandy District Water Supply and Sanitation project.

**Germany**

Through the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), the German Ministry for Economic Cooperation (BMZ) has supported a variety of Program activities. Through 1990, BMZ’s direct financial contributions totaled about $2.5 million.

A project approved in 1989 has been assisting the Tanzanian government in promoting and implementing low-cost sanitation programs. GTZ has placed an adviser in the Ministry of Water, Energy, and Minerals who is being backstopped by RWSG-EA. The project has assisted three town councils to construct demonstration VIP latrines, supported the manufacture of latrine components, and pro-
moted on-site sanitation through media campaigns. GTZ has earmarked about $100,000 for the Program’s technical assistance to the project.

GTZ and the Program have collaborated on a number of resource recovery activities around the world. Chief among them is the San Juan aquaculture research project in Lima, undertaken in partnership with CEPIS (the Pan-American Center for Sanitary Engineering and Environmental Sciences). The research phase, which has now been largely completed, demonstrated that satisfactory fish growth and sanitary quality can be obtained. The research also indicated that properly designed and managed aquaculture schemes may be viable as alternatives to conventional wastewater treatment. Several papers have presented various aspects of the research and a comprehensive final report on the project has been drafted. The feasibility of holding an international symposium to disseminate the results is being investigated.

Another resource recovery activity GTZ sponsored was a waste-fed aquaculture seminar in Calcutta. The proceedings have undergone thorough review and were published and disseminated in late 1991.

In Nigeria, the Dutch have made a contribution of $775,000 to the $5 million RUSAFIYA (an acronym in Hausa for water, sanitation, and health) project. RUSAFIYA aims at developing replicable and sustainable ways of delivering rural water supply and sanitation. The project began in 1989 and covers five states, which also provide project financing to supplement support by UNDP, the Netherlands, and the Nigerian federal government. The Dutch government participated in an in-depth evaluation of RUSAFIYA in late 1990.

In Indonesia, the Program is executing the Community Water Supply and Sanitation Project (INS/88/005) jointly financed by the Dutch government ($2.8 million) and UNDP ($1.3 million). The project started in 1990, with demonstration sites in Sidoarjo (East Java) and Badung (Bali). Emphasis has been placed on strong software components that accompany the physical facilities, key among them institution building and social marketing to increase awareness and stimulate demand for sanitation. The Netherlands also financed the first phase of a training network center at the Institute of Technology in Bandung (ITB), which ended in April 1989. A second phase, which would incorporate the training network center in Cipta Karya, has been approved by the government and proposed for Dutch funding.

Collaboration between the Netherlands and the Program has been growing rapidly in the past few years. With a contribution of more than $6.6 million approved through 1990, the Dutch government is now the Program’s second largest bilateral donor. The Dutch contribution has been directed almost exclusively to large programs in four countries of concentration for the Program: Nigeria, Indonesia, Bolivia, and the Philippines.
One of the poorest countries in Latin America, Bolivia is the site of $4.0 million Dutch-financed program approved in August 1990. The major component of the program is a $2.8 million rural water supply and sanitation project in Potosí Department. The project is designed to provide about 75,000 dispersed rural inhabitants with improved water supply (through 1,250 wells equipped with handpumps) and sanitation. At the same time, it will be developing and demonstrating a decentralized, community-based model for rural water supply and sanitation services that can be replicated on a national scale. Supporting the Potosí project are a country coordinator (stationed in La Paz) and a monitoring and evaluation specialist (in Potosí). They oversee an urban water and sanitation pilot project in Cochabamba and are involved in national-level donor coordination and development of a human resource development/training initiative to support water supply and sanitation on a national scale.

In the Philippines, the Dutch government has approved $1.0 million (not included in the total above) to fund a training network center hosted by a number of Philippine agencies, including the Local Water Utilities Administration (LWUA) and an NGO (Tulungan sa Tubigan). In operation since January 1990, the center is working with the Program to help the government institutionalize appropriate technologies and approaches.

Norway

Through the Department of Multilateral Development Cooperation, Norway supports a range of Program activities—at regional and global levels as well as in countries in East and West Africa and in South Asia. With a cash contribution of $7.1 million approved through 1990, Norway is the largest direct financier of the Program and has had a significant impact on the size and direction of the Program’s activities. Three demonstration projects, which should lead to larger investments as well as produce lessons with broader utility, are at various stages:

- Rural water supply and sanitation, West Bengal, India: The project aims to demonstrate the impact of integrated approaches to water and sanitation on health standards and productivity and to develop a delivery system that is effectively utilized, sustainable, and can be replicated in other similar communities. The demonstration phase covering 24 villages will cost about $800,000, with $550,000 from Norway and the remainder from the government of West Bengal. It began in August 1990 and is expected to last about three years, after which expansion to 270 villages is foreseen.

- Community piped water supply and sanitation, Nasarawa District, Plateau State, Nigeria: This project will be implemented in conjunction with the ongoing RUSAIFIYA Rural Water Supply and Sanitation Project, to respond to the de-
mand from communities of 1,500 to 5,000 or more for piped water supplies with public standposts (RUSAFTIYA uses handpumps for smaller communities). It will seek means of establishing community management of such systems, including planning, operation, maintenance, and revenue collection. Now awaiting final government approval, the project will last three years.

- Urban sanitation demonstration, Ethiopia: A sanitation plan will be developed for the town of Assela and demonstrated in two kebeles (neighborhoods). The demonstration will devote special consideration to the needs of women and the environment, put community outreach and mobilization programs in place, and train local artisans and community members in the construction of sanitation facilities. The results will contribute to improved knowledge of the technologies, financing mechanisms, and institutional structures needed for sanitation in low-income urban areas in Ethiopia. The project document has been finalized and is pending government clearance.

Country-level activities are under way in Zimbabwe and Pakistan:

- Support to the Ministry of Health, Zimbabwe: The government of Zimbabwe places high priority on water supply and sanitation and on implementation of low-cost, sustainable solutions, but there is a continuing need for coverage among substantial proportions of the population. The Program has been active in Zimbabwe since 1984, when advisory support was first provided to the NORAD-financed rural water supply and sanitation master planning team. A rural water supply and sanitation adviser was later placed in the Ministry of Health to help develop a national rural water supply and sanitation program. A second adviser took up the post in August 1989 and has concentrated on project implementation and on assistance in other aspects of sector development. The Project has played a significant role in assisting the Ministry to develop and implement its successful national rural water supply and sanitation program.

- Training Centre for Water and Sanitation, Uni-
versity of Zimbabwe: A major addition to human resource development capacity, the Training Centre is a project of the University of Zimbabwe, with external financing from Norway and UNDP through UNDP Project ZIM/88/006. Launched in 1989, the center offers training in low-cost water supply and sanitation to sector personnel in countries of the southern Africa region, carries out research on priority topics, and provides information support to the water and sanitation sector.

- Country Coordinator, Pakistan: Pakistan is a country of concentration for the Program, with a $137 million IDA-supported rural water and sanitation project under way. The country coordinator is responsible for developing, carrying out, and directing country program activities jointly with a national team. This includes giving support to donor project preparation based on Provincial Strategic Investment Plans and providing specialist inputs in various rural water supply and sanitation programs in the field of low-cost sanitation, health education and environmental impact, and support to preparation of project proposals dealing with WID activities. The country coordinator has also assisted in sector strategy work in Nepal.

The Norwegian contribution also funds core staff members in three of the four RWSGs and in Washington.

- A senior rural water supply and sanitation specialist in the South Asia RWSG, who has been active in developing country programs in India, Nepal, and Sri Lanka, as well as in directing and supervising the activities of national country officers (NCO) working within the framework of these country programs. In addition, in a regional capacity, the senior specialist has supported the preparation of project proposals to country operations dealing with WID activities and has participated in the formulation of joint workplans with other organizations active in South Asia.

- A sector planning engineer in the Nairobi RWSG, who has had responsibility for RWSG activities in Ethiopia, Kenya, and Lesotho and has served as acting RWSG manager during much of 1989. He is seconded from WHO and, in the future, will also be devoting part of his time to building country-level linkages between WHO and the Program.

- A regional-level post initially approved for East Africa has been transferred to the Abidjan RWSG and will be filled with a francophone sanitary engineer. A solid waste management specialist is being recruited for the headquarters position in Washington.
Sweden

Over the past year, the Swedish International Development Agency (SIDA) has financed an assistant expert position in the East Africa RWSG. The present incumbent completed his assignment in mid-1991; discussions are under way concerning continuation of the position.

Switzerland

Through the Swiss Development Corporation (SDC), Switzerland has been an active participant in the Program since 1984. SDC’s primary areas of interest have been in rural water supply, particularly handpump development and private sector support; human resource development and training, mainly through the International Training Network; and low-cost sanitation. Geographically, the focus has been on Africa. Two new agreements were signed during FY1991 that continue these emphases but extend SDC’s support of Program activities to Asia and add a major new activity—sector advisory support. In total, SDC’s direct support approved to date totals more than $5.1 million, making Switzerland the Program’s third largest bilateral donor. Major activities include the following:

- **Human resource development and training:** SDC is the bilateral most involved in human resource development and the ITN. SDC supports two ITN centers through direct bilateral arrangements with them. NETWAS, the regional center for East Africa based in AMREF in Nairobi, has been in existence for five years, jointly financed by SDC and GTZ. In West Africa, SDC and CIDA have been financing CREPA, the regional center for 15 countries in francophone Africa, located at CIEH in Ouagadougou, Burkina Faso. To assist the Program to strengthen its central ITN coordination capacity and begin strategic planning for human resource development, SDC has agreed to fund the ITN coordinator position, beginning in July 1991 when the new coordinator took up the post in Washington, D.C.

- **Technology development and promotion:** SDC has placed a production engineer in West Africa (stationed in Accra) who has been active in supporting local manufacture of handpumps, particularly in Benin, Ghana, Côte d’Ivoire, Nigeria, and Mali. SDC is also, through a contract with SKAT (the Swiss Center for Appropriate Technology), making available consultant services to the RWSGs to support local manufacturers and design teams and providing assistance to the standardization and local manufac-
ture of the Afridev handpump. These activities are closely linked to the Technology Unit established by the Program in New Delhi to promote affordable technologies and to serve as the hub for Program efforts in this field.

- Sanitation and solid waste management: Two SDC-financed regional posts are involved with sanitation and solid waste management. In West Africa, the sanitation specialist has been active in Guinea, Benin, and the Congo. The SDC-financed post in East Asia will be filled later this year, with the incumbent being responsible for the RWSG's work in sanitation and waste management work for poor urban communities.

- Sector development in Lesotho: To strengthen the capacity of the Ministry of Planning, Economics, and Manpower Development, SDC and the Nairobi RWSG will provide a series of inputs over a three-year period, including 12 months of support from a sector adviser. The adviser has been recruited for the post in Maseru, Lesotho and will begin work early next year.

- Program coordination: SDC is financing an economist in the Program Coordination Group in Washington. His duties include helping to launch work in Latin America, the ongoing Program in the Arab States, and serving as the liaison for the Africa RWSGs.

United Kingdom

At present the United Kingdom, through the Overseas Development Administration (ODA), is working with the Program mainly in human resource development in South Asia. Direct contributions approved to date total about $0.8 million, with additional funds made available through indirect arrangements.

Through an agreement approved in June 1990, ODA is financing a human resource development specialist in the New Delhi RWSG. The HRD specialist, who took up his post in September 1990, has been extremely active in a range of HRD and training activities in India, where ITN activities are growing rapidly through the ITN center at the All India Institute of Hygiene and Public Health; and in Bangladesh, where the ITN center (financed by DANIDA) at the Bangladesh University of Engineering and Technology should be in full operation in early 1992.

Through an arrangement with the All India Institute of Hygiene and Public Health, ODA is also financing the activities of the ITN center, with support estimated at about $1.5 million through 1994.
Technical Assistance Projects
Implemented by the UNDP-World Bank Program
June 1991

Global and Interregional Projects

GLO/84/007 Research and Development in Integrated Resource Recovery—Waste Recycling
GLO/90/011 Technology Promotion Facility
INT/87/035 Integrated Resource Recovery
INT/87/013 Water Supply for Low-Income Communities
INT/87/014 Sanitation for Low-Income Communities
INT/87/024 Efficiency of Investments in Water Supply
INT/86/027 International Training Network for Water and Waste Management
INT/88/711 International Training Network for Water and Waste Management: Inventory of Training Materials (executed by UNDP)
INT/89/008 Support to the Collaborative Framework (executed by UNDP)

Regional Projects

RAF/86/038 Water Supply and Sanitation Sector Development Teams (SDT) for Sub-Saharan Africa (Phase II)
RAF/87/049 Water Supply for Low-Income Communities
RLA/86/025 International Training Network for Water and Waste Management in Latin America
RAB/88/009 Improvement of Water Supply, Sanitation, and Waste Management in the Arab States Region

Country Projects

BGD/85/004 Low-Cost Sanitation Program for 51 Pourashavas (Bangladesh)
BOL/90/004 Rural Water Supply and Sanitation: Potosi (Bolivia)

BKF/89/016 Strategic Sanitation Plan for Ouagadougou (Burkina Faso)

CPR/88/011 Low-Cost Rural Water Supply and Sanitation (China, executed by the government)

ETH/90/010 Management and Decentralization for Water Supply and Sewerage Authority (Ethiopia)

GHA/87/016 Low-Cost Human Wastes Management—Pilot Project for Kumasi (Ghana)

INS/88/005 Community Water and Sanitation Project (Indonesia)

MAG/89/001 Strengthening of Planning Capacity and Economic Management (Madagascar, executed by UNDP)

NIR/87/011 Rural Water Supply and Sanitation (Nigeria)

PAK/90/013 Establishment of Federal Water Supply and Sanitation Sector Support Unit (Pakistan)

PRC/88/018 Preparation of a Sector Development Brief for a Donors Conference on Water Supply and Sanitation (Congo)

RWA/89/001 Strengthening of Sanitation Subsector (Rwanda)

SUD/88/040 Preparatory Assistance for Water Supply and Sanitation Sector Strategy and Planning (Sudan)

ZIM/88/006 International Training Network for Water and Waste Management: Network Centre at the University of Zimbabwe (Zimbabwe)
Regional Summaries
West Africa

The Regional Water and Sanitation Group based in Abidjan has expanded operations over the past two years, undertaking new work in Benin, Burkina Faso, Mali, and Guinea, and maintaining its concentration activities in Nigeria and Ghana. The RWSG provides an essential regional resource for capacity building and technical support and is currently giving top priority to policy dialogue leading to large-scale investment programs. West African governments, the World Bank, and other donors all continue to seek its advisory services.

During the past year, RWSG staff prepared sector development strategies for rural water supply and sanitation in Ghana, Nigeria, and Benin, and completed urban sanitation strategies for Ghana and Burkina Faso. Togo and Mali will also be the focus of new efforts to formulate rural water strategies, while urban sanitation strategies will be developed in Guinea. In Ghana and Nigeria, the RWSG staff are preparing coordinated action plans and full-scale water and sanitation projects with financing from the World Bank and other donors.

Qualified, well-trained personnel are needed at all levels to expand sector services in West Africa. The RWSG-WA is addressing this human resource gap through ongoing support to the International Training Network centers in Ouagadougou and Kumasi. The creation of two additional ITN centers in Nigeria has been studied, and final plans will be ready next year. To foster the growth of the private sector, the RWSG-WA is putting special efforts into increasing the market share of national consultants, contractors, and manufacturers based in the region.

The RWSG office in Abidjan is staffed by seven professionals: six are supported by the UNDP's Regional Africa Bureau (RAF) and one by the Swiss government. There are five engineers, one financial analyst, and one community devel-
opment specialist. The RWSG branch in Accra, Ghana, has a country coordinator financed by RAF and a manufacturing specialist financed by Switzerland. More than half the Program staff in RWSG-WA are Africans. Ghanaian professionals manage the Kumasi Sanitation Project and the Bolgatanga Community Water Supply Project. Nationals also manage the International Training Network center in Burkina Faso. In Ouaga- dougou, Burkina Faso, a team of seven national staff assisted by an international RWSG staff member is preparing a citywide sanitation plan.

Program work in Nigeria involves many parts of the water and sanitation sector. A manufacturing specialist financed by RAF assists several private companies in Afridev handpump production. An eight-person team with three international staff based in Jos, Plateau State, manages the RUSAFIYA demonstration project. In 1991, Nige- rians assumed full responsibility for project management. Plans are being prepared for a RWSG branch office in Lagos.

The RUSAFIYA Project in Nigeria and the Kumasi Sanitation Project in Ghana are the RWSG’s longest-running and largest demonstration operations. They are laying the groundwork for sector development strategies in both countries, and similar demonstration projects are now being launched in Mali (rural water supply) and Burkina Faso (urban sanitation) and are under preparation in Guinea (rural water supply and urban sanitation).

Sector development also depends on technical support. RWSG technical assistance to local private manufacturers may soon lead to manufacturing of direct-action pumps in Ghana. Field testing of uPVC rising mains, fiberglass pump rods, and VLOM-design pumps is under way in Mali, Côte d’Ivoire, and Ghana. Alongside this, RWSG sector studies are assessing the broader economic factors affecting the rural water sector and local pump manufacturing within the region.

During FY90-91, the RWSG-WA provided training for rural water supply staff in Zaïre and helped to prepare a project for a national comprehensive program under consideration for UNDP financing. It also participated in a sector mission to Guinea Bissau together with UNDTCD, that focused on urban water supply and sanitation. Program staff have developed a solid waste management project in Cameroon, with financing being considered by the Swiss government.

In Côte d’Ivoire, work continues on community piped water systems and the expansion of sanitation facilities in primary schools in Abidjan. Municipalities in Abidjan are deciding on plans to borrow from the municipal development fund to expand water and sanitation facilities. In Ouagadougou, Burkina Faso, the RWSG-WA continues to support CREPA, the regional training center for French-speaking Africa, financed by the Canadian and Swiss governments. CREPA is currently involved in several low-cost sanitation projects sponsored by the Program. Efforts are under way to integrate more fully CREPA’s work program with Program objectives.

To raise awareness of appropriate sanitation methodologies, RWSG-WA is working with the Union of African Water Suppliers (UADE) to prepare a report on urban sanitation, which uses Program activities in Kumasi and Ouagadougou as case studies. The study will be presented at the UADE general assembly to be held in February 1992 in Benin.

Reports on activities in individual countries during 1990-91 follow.
Benin

In many respects, Benin presents a microcosm of the Program's approach to providing new water supply and sanitation services. Demonstration projects provide an initial opportunity to study the sector, to work with national sector planners, and to shape projects to local needs and conditions. Then work begins with local authorities, external donors, NGOs, and communities to produce an effective strategy for the large-scale expansion of coverage.

That approach is working currently in southern Benin, where more than 35,000 people in Cotonou and Borgou provinces have benefited from better onsite sanitation through the UNDP-funded, low-cost sanitation project BEN/87/003. The project sponsored the construction of public latrines in hospitals and schools and trained masons in latrine construction and health workers in hygiene education. The RWSG-WA spearheaded these activities and provided technical advice and training materials that were distributed widely. Postproject evaluations indicate that increased awareness of sanitation issues has led to a willingness to pay for the use and maintenance of the facilities.

After the successful completion of the project in February 1990, the Ministry of Health requested the RWSG-WA to help develop a comprehensive national sanitation policy during 1991. Related to this, RWSG-WA has been assisting the government in designing a sanitation demonstration project for a poor neighborhood of Cotonou containing more than 18,000 people. The project focuses on health education, community management, and innovative cost sharing. The pilot will also establish an incentive scheme for private solid waste contractors. Financing will be provided through the World Bank (IDA) Cotonou Urban Rehabilitation Project, and implementation will be managed by a local NGO with RWSG-WA support.

Following the May 1990 Abidjan Conference on Rural Water Supply, the Ministry of Equipment in Benin requested the RWSG-WA to help prepare a rural water supply strategy and action plan. Fieldwork began in February 1991 and the draft plan was completed in July 1991. It will include recommendations on decentralizing decision making, promoting cost sharing by communities, increasing the role of the local private sector, and reducing investment and operating costs.
**Burkina Faso**

A team from the national water and sewerage utility, together with a project coordinator from RWSG-WA, began work in November 1990 on the Ouagadougou Strategic Sanitation Plan (BKF/89/016). The plan adopts a demand-driven approach to expanding sanitation services, including on-site systems as well as simplified sewerage. The team has identified a demonstration site for testing and refining these systems and will soon begin meeting with community members in selected areas to discuss designs and other planning considerations. Through a PROW-EV workshop, the team has sharpened its skills in communication and community participation approaches. CREPA-Burkina Faso, which comprises the key national sector agencies, is providing the project with advisory services and contributing to the planning process. The plan will be completed by the end of 1991, and its key recommendations will be implemented through a new World Bank (IDA) environment protection project.

**Ghana**

Based on the successful results of the Program's demonstration project in Bolgatanga, the Ghanaian government requested the RWSG-WA to prepare a national water supply development plan. In early 1991, the RWSG staff presented the plan and discussed it in conference with government agencies, NGOs, and interested donors. The govern-

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**Planning Urban Sanitation in West Africa**

Creating effective urban sanitation programs is a step-by-step process. First, the government needs to designate an agency to manage waste collection, treatment, and disposal. Then, it must select a multidisciplinary planning team to work closely with technical experts. Following a situation analysis, the team can recommend specific technological, institutional, and financial options. Their conclusions then form the basis for an implementation plan, including an investment schedule. Demonstration activities, as a first step to full-scale implementation, help to refine strategies.

Currently, there are two such sanitation plans under preparation in West Africa, and initial work is under way in preparing others. RWSG-WA staff based in Kumasi, Ghana, and Ouagadougou, Burkina Faso, are assisting city governments to develop sanitation plans primarily for excreta disposal. They have reviewed technological options for excreta treatment and disposal for each city. And they have considered a range of conditions characteristic to each neighborhood, such as housing type and densities, infiltrative capacity of soils, depth to groundwater, user preferences, water-use practices, users' willingness to pay for services, and costs of investment and operation and maintenance. On the basis of these reviews, VIPs and septic tanks have been proposed for various parts of Kumasi. In Ouagadougou, the VIP and pour flush stand out as the best options, along with improvements to existing systems and a simplified sewerage for the city center. These technology options for the different areas of each city are now being packaged into large-scale investment projects for review by government and donors.

Another useful planning tool emerging from West Africa is the willingness-to-pay study, which can be used to determine technology choice and appropriate financing mechanisms. Through questionnaires, willingness-to-pay studies collect a wealth of information that reflects community attitudes toward sanitation. Among other things, the studies measure satisfaction with existing water and sanitation services, specific preferences, local aspirations, housing types, family sizes, and finances. In Kumasi, the willingness-to-pay study documented house renters' widespread dependence on public latrines. In Ouagadougou, the majority of respondents are home owners, who expressed the need to improve sullage disposal facilities. This information helped the planning team to make better recommendations to meet people's needs.
ment is approving the conclusions, and RWSG-WA is preparing a detailed action plan to coordinate government and donor efforts, including those of the World Bank. The action plan addresses decentralization of operation and maintenance, human resources development, and enhanced roles for the local private sector and NGOs.

The Kumasi Sanitation Project (GHA/87/016) is addressing problems of solid and human waste management in a major city. Financed by UNDP and implemented by a 10-person waste management team in the Kumasi Metropolitan Authority, the project supports improved sanitation services through demonstration activities. A recently completed citywide sanitation plan included an innovative study of the willingness to pay for sanitation services, based on similar surveys designed for water supply. The new methodology is now being documented so that it can be used in other countries.

Located within the University of Science and Technology (UST) in Kumasi and financed by the UNDP, Ghana's ITN center is making a growing contribution to human resource development. The center trains sector professionals, produces and disseminates training materials, conducts research on the needs of low-income communities, and helps to implement the rural water supply and sanitation action plan. Closely linked to the ongoing sector program, the ITN activities help to fill immediate personnel needs and enhance the practical experience of the 10 nationals who staff the ITN center.

RWSG-WA staff recently analyzed the local production of handpumps, and now assists a private company in producing and marketing low-lift Nira pumps. An estimated 5,000 units will be needed in Ghana over the next decade. RWSG-WA staff have also tested threaded uPVC rising main connectors and fiberglass pump rods with positive results. Such innovations will help to improve pump durability and reliability and reduce the cost of handpumps used in Ghana.

Guinea

To address problems of the urban environment in Conakry, Program staff have worked during the past year to prepare a large-scale sanitation program. The IDA (Second Urban Project) and the government of Luxembourg are supporting background studies for the sanitation program, and the RWSG-WA is coordinating the review of these studies and assisting in the preparation of the final program. Together with UNICEF and CREPA, the RWSG has prepared a sanitation project for primary schools in Conakry, which is a candidate for financing from the AfDB-supported Education Project. Fieldwork for both activities will start during FY92.

RWSG-WA is assisting IDA
in the supervision of a rural water supply project in the north-west region, and a willingness-to-pay study of water supplies in rural areas. Together with CREPA, the RWSG is initiating a demonstration project for roof catchment technologies in periurban areas.

Mali

An IDA-financed project to rehabilitate several hundred rural water supply points in southern Mali was launched this year with assistance from the RWSG-WA. The project promotes improved use of handpumps through better delivery of health information and privatizing the distribution of spare parts and maintenance activities. A program of field testing uPVC rising mains is now under way in the same region, which involves national agencies and the local manufacturer of India Mark pumps. Successful results of the tests on uPVC rising mains would signal a cost-effective alternative to steel, which suffers from corrosion.

RWSG-WA will also participate in the preparation of urban and rural water supply strategies with the water resources master plan project team supported by UNDP.

Nigeria

During this past year, RWSG-WA provided support at the national level in a number of key areas. Program staff assisted the government in completing a comprehensive rural water and sanitation sector strategy focusing on institutional support, financing mechanisms, technology choice and maintenance systems, human resource needs, and support for local manufacturers and contractors. A national conference to be held next year will consider the strategy, which recommends a larger role for local governments. RWSG-WA has already provided assistance to Katsina and Kaduna States for the World Bank-financed Multi-State Project, and Anambra State in the preparation of a strategy and action plan for rural water supply and sanitation. A national action plan, prepared with RWSG-WA support, will next address medium and long-term investment needs and the implementation of innovative approaches and methodologies. Rural sanitation strategies will place special emphasis on marketing, promotion, and links with health and environmental issues.

Launched in early 1989, the RUSAFIYA demonstration project aims at determining the processes and resources needed for sustainable rural water supply and sanitation systems in Nigeria. The $4 million project is
supported by five state governments, the Nigerian government, UNDP, and the governments of the Netherlands and Norway. Implemented by the Ministry of Health and executed by the Program, RUSAIFIYA’s approach is based on the national decentralization policy that allows rural communities to take the lead in choosing and locating their water supply systems, in managing revenue collection, and in contributing to the construction costs. The project also supports small, piped water systems that are fully managed by the communities.

Strengthening local capacity for project management is a prime focus of RUSAIFIYA, which has trained extension agents, masons, community representatives, and private contractors. A detailed assessment has identified several potential local handpump manufacturers, and with RWSG-WA assistance, they will soon begin manufacture of India Mark II and III and Afridev handpumps. The government will buy the first batch of several thousand locally produced pumps. In the near future, communities will purchase the pumps directly from private retailers throughout the country.

In association with the Overseas Development Administration (UK), the Program has conducted a needs assessment for the establishment of two new ITN centers. They will be located at the National Water Resources Institute in Kaduna and at the University of Nigeria at Nsukka.

Funding from the United Kingdom is supporting project preparation prior to establishment of the new centers.

Next year, RWSG-WA will initiate activities in several Nigerian cities to improve planning and delivery of human solid and liquid waste disposal services. RWSG-WA will work with local consultants and sector experts selected by city and state governments to address sanitation planning, technology choice, willingness to pay and financing mechanisms, human resource requirements, marketing, and privatization. will be stimulated through A series of workshops for sector personnel will stimulate awareness of urban sanitation problems and solutions.
Eastern and Southern Africa

The Program concentrates on three countries in Eastern and Southern Africa—Ethiopia, Uganda, and Zimbabwe—and provides smaller amounts of assistance to the Comoro Islands, Lesotho, Kenya, Madagascar, Malawi, Namibia, Rwanda, Sudan, and Tanzania. In the three concentration countries, a range of mutually reinforcing activities is under way to help define national programs and approaches that could be replicated elsewhere. In the other countries, the Program targets technical support to specific local needs.

In pursuing this strategy, the Regional Water and Sanitation Group for Eastern and Southern Africa (RWSG-EA), like the other RWSGs, gives special attention to community management and the process of expanding coverage on a large scale. Community management denotes more than local participation. If water and sanitation facilities for the poor are to be sustainable, programs must work toward establishing full community ownership and responsibility for facilities that are desirable and affordable. The widespread use of community management approaches can assure sufficient financial and management resources for large-scale sustainable facilities. Local or provincial programs that show special promise can be replicated on a large scale as part of national sector development programs.

Based in Nairobi, Kenya, the RWSG-EA had eight professional staff in 1990-91: two were financed by UNDP's Regional Bureau for Africa; four by bilateral donors (CIDA, DANIDA, FINNIDA, and Norway); one through PROWWESS; and one was a UNDP junior professional officer financed by SIDA. The team is balanced between social scientists and technical specialists, and each member takes responsibility for the Program's work in two or three countries and acts as a resource for the team in his or her area of professional expertise. The PROWWESS specialist
also serves part-time in West Africa.

In addition to the team in Nairobi, RWSG-EA supervises expatriate advisers in Ethiopia, Rwanda, and Zimbabwe (financed from UNDP country projects), as well as the national professionals who manage the Training Centre for Water and Sanitation (TCWS) in Harare, an International Training Network center financed by the government of Norway and by UNDP’s country program for Zimbabwe. RWSG-EA also provided technical support to UNDP-financed advisers in Malawi, and to GTZ and UNDP-supported advisers in Tanzania.

Sector advisory support has been the mainstay of RWSG-EA’s activities, and over the years most countries in the region have progressed considerably because of this work. The past year has seen some shift toward demonstration and training activities, but a strong emphasis remains on carrying out sector advisory support where it is needed and requested.

Demonstration projects have taken on greater importance to ensure that an adequate foundation is in place to support upcoming initiatives for large-scale expansion of coverage. Program staff have prepared new demonstration projects in Ethiopia and Zimbabwe and have begun work on a pilot project in Uganda. In preparing new demonstration projects, the RWSG-EA staff review similar ongoing projects financed by other donors to distill lessons and to document them in case studies. During the past year, case studies of this kind were completed on projects in Kenya and Lesotho.

Training and human resource development activities have also been growing in importance. RWSG-EA works in close association with NETWAS, the ITN center at AMREF in Nairobi, and provides supervision for TCWS, the ITN center in Harare. TCWS got off to a vigorous start in its first year of operation, with all courses fully subscribed and much of the costs covered by participant fees. RWSG-EA has worked closely with the ITN centers, as well as government agencies and NGOs, to develop a series of training workshops in the participatory methodologies developed by PROWWESS.

Until recently, promotion of affordable technology in the region has focused on field testing and promotion of local manufacture of Afridev handpumps. RWSG-EA advisers still make recommendations to project staff and governments on handpumps and monitor performance of Afridev pumps installed across the region, but the primary technical capability in handpump technologies and local manufacture has been transferred to the RWSG in New Delhi, which is now providing support as required to countries in the region. As a start in tackling other technology issues, RWSG-EA participated in a joint mission with IRC-WD (Duebendorf) to investigate urban solid waste management in Uganda and Zimbabwe.

The RWSG-EA continues to play an informal role in coordinating among donors active in the sector. Financing arrangements for the RWSG-EA team reflect strong donor support. RWSG-EA is regularly called on to participate in the evaluation of bilateral projects and programs. Contacts of this kind contribute greatly to the team’s effectiveness, both in its own work and in coordination activities.

Operational support to the World Bank also deserves to be singled out as an essential contribution of the RWSG. The RWSG-EA clearly has an interest in influencing the World Bank’s lending operations, and in particular, in facilitating lending to improve the access of poor people to sustain-
able services. This process is fundamental to expanding coverage on a large scale. The past year has seen increasingly close collaboration, with RWSG-EA staff participating in Bank operational missions to Ethiopia, Madagascar, Mozambique, Sudan, Uganda, and Zimbabwe.

In meeting the diverse requests for assistance, the RWSG has lent support to countries throughout the region. An RWSG-EA mission to the Comoro Islands helped the government to finalize a position paper and draft a strategy and action program for the water and sanitation sector. While there are no project activities in Kenya currently, RWSG-EA staff continue to play a role of informal coordination and support. In 1990-91, for example, they participated in three bilateral donors’ missions of review and evaluation, contributed actively to the sector coordination forum hosted by UNICEF, and prepared a case study on NGO activities in one of Nairobi’s informal settlements.

RWSG-EA staff undertook several missions to Malawi to provide sector expertise and to monitor the performance of Afridev-type handpumps, which are extensively used there. Two UNDP-financed, government-executed projects, which RWSG-EA helped to design, are now getting under way. These projects cover support for community-based management in the rural water sector and institutional support to facilitate a national rural sanitation program. RWSG-EA is providing technical support and advisory services. Just prior to the independence of Namibia in 1990, RWSG-EA joined with WHO and UNICEF to prepare a sector overview paper for the new government. During the past year, it contributed to the development of a sector policy paper. In Sudan, RWSG-EA supervised UNDP sector advice to the Ministry of Planning, but the proposal was delayed because of the drought. In response to the critical situation, RWSG-EA staff participated in a World Bank operational mission to prepare emergency lending for drought recovery.

Reports on activities in individual countries during 1990-91 follow.
Ethiopia

RWSG-EA has been executing a UNDP-financed project on Investment Planning and Management for the Water Supply and Sewerage Authority (WSSA), which includes assignment of a financial analyst and an engineer to WSSA. A follow-up project, Management and Decentralization for WSSA, was approved in March 1991 and provides for a continuation of the engineer assignment. The project complements the technical assistance component of the IDA-funded Market Towns Project, which was prepared and appraised by World Bank operations staff with assistance from RWSG-EA.

In collaboration with UNICEF, RWSG-EA continues to support WSSA in developing local handpump manufacturing. Assistance to the Water Resources Commission has established a program of training in community management using PROWWESS approaches with additional support from UNICEF. The RWSG staff prepared two new demonstration projects: a rural water supply, sanitation, and health education project funded by CIDA; and an urban sanitation demonstration project in a secondary town funded by NORAD.

Political developments in the past year have slowed the pace of project implementation, but with the return of stability it is likely that investment flows to the sector will increase substantially. The Program is well placed to assist when the time comes.

Lesotho

UNDP support to the National Rural Water and Sanitation Program came to a conclusion in 1989. During 1990-91, a discussion paper, Rural Sanitation in Lesotho, was published, detailing the successful development of the program and the keys to its sustainability. A complementary discussion paper on the Urban Sanitation Program in Lesotho will be published later this year. RWSG-EA staff also made preparations for posting an adviser to the national sector coordinator, with Swiss financing (SDC) and supervision by RWSG-EA. Beginning later this year, the new adviser will work with the sector coordinator to assist in initiating integrated rural water and sanitation programs, including district-level monitoring and evaluation.

Madagascar

Earlier Program work on a sector position paper led during the past year to the preparation of a strategy and action plan financed by UNDP and supervised by RWSG-EA. The work is being undertaken by the National Water and Sanitation Committee with the help of local consultants. The box on page 59 describes the approach and progress thus far.
**Rwanda**

The past year saw initial implementation of a UNDP-financed urban sanitation pilot project in Kigali. RWSG-EA provides supervision to the project with the help of a resident sanitation adviser and a locally based NGO. The project has been building demonstration pit latrines, solid waste collection points, and canals for rainwater drainage.

**Tanzania**

RWSG-EA provided technical support and advisory services to three projects during the past year: a sector advisory team in the Ministry of Water, Energy, and Mines, financed by UNDP and several other UN agencies. RWSG staff organized a training workshop on PROWESS participatory meth-

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**Madagascar Formulates a Sector Strategy and Action Plan**

Madagascar is one of the poorest countries in Africa and suffers from a high rate of waterborne disease and water-related mortality. Only half the people in cities have access to safe water, and fewer than one in thirty have adequate sanitation. Service levels in rural water and sanitation are far worse than in urban areas. For years, progress in the sector has been held back by the fragmented institutional structure and by uncoordinated donor action. A lack of overall sector objectives and unclear policies have plagued project implementation and skewed resource allocations. Poor management has stifled efforts in system operation and maintenance.

Developing a water and sanitation system to benefit the people of Madagascar required formulating a national sector strategy and action plan and efforts to coordinate donors. National sector strategy and action plans (often called SSAPs) have been widely adopted in the region to develop a comprehensive picture that can lead to increased investment and policy reforms. With support provided by a UNDP planning project, national consultants have been preparing a strategy and action plan during the past year, using the support of one foreign consultant and the supervision of RWSG-EA.

Initially, the RWSG-EA staff undertook a brief review of the status of water and sanitation services in Madagascar and drafted a preliminary paper for the National Water and Sanitation Committee. Next, a local consulting team was brought in to incorporate its own investigation and the committee's comments into a revised position paper, forming the basis for a strategy and action plan.

Most often SSAPs have been drawn up by RWSG-EA staff or foreign consultants. Madagascar was the first country in the region where local officials and consultants themselves undertook this fundamental policy work. In the summer of 1990, bids from local consultants were widely solicited. By October, the firm was selected and the National Water and Sanitation Committee held a "launch workshop," attended by representatives of all the agencies concerned (ministries, parastatals, NGOs, and donors).

The completed report was sent to the committee in mid-1991, and another discussion workshop for all concerned agencies will proceed with the strategy and action plan, which is expected to be completed later this year. In all, the foreign consultant spent about six weeks and contributed an important chapter of the report, but responsibility clearly rested with the local consulting firm.

While the process has taken longer and has incurred some additional costs, the agreement on a national strategy and action plan forged through the work of local experts and officials should revitalize the development of water and sanitation services in Madagascar.
with the interministerial National Action Committee in the development of sector policy and plans. They also provide training to local staff, carry out policy studies to strengthen national sector policy, and assist in developing projects and financing by bilaterals, multilaterals, and NGOs.

Preparatory work on two new demonstration projects was completed in 1990-91. One is a national project for water and sanitation development on commercial farms, and the other is a program to upgrade family wells. In addition, the Ministry of Energy and Water Resources and Development has requested assistance in drawing up a national plan for water and sanitation.

Since 1989, RWSG-EA has assisted the University of Zimbabwe in establishing a regional training network center. The Training Centre for Water and Sanitation conducted its first classes last year and provided a range of short- to medium-length sector courses to participants mainly from Zimbabwe and neighboring countries. The courses attracted considerable interest, and attendance was high despite fees set to recover all costs except staff salaries. The center staff have also undertaken occasional evaluation and applied research activities on a contractual basis. (See page 16, "Zimbabwe: Providing a Quality Technical-Training Program.")
South Asia

The Program concentrates on water and sanitation issues in three countries in the region—Bangladesh, India, and Pakistan. During the past year, sector planning activities were initiated in Nepal and Sri Lanka. RWSG-SA has also recently initiated activities in Bhutan and Myanmar and it is likely that systematic national workplans can be completed in the coming year.

Sector advisory support has been the entry point and primary Program activity in South Asia. During this year, the RWSG-SA shifted its emphasis in Bangladesh, India, and Pakistan from sector planning to the process of large-scale expansion of coverage, supporting new investment projects in cooperation with the World Bank and several bilateral donors. In Nepal and Sri Lanka, sector work is also under way that will lay the groundwork for new investment projects, including donor support from the Asian Development Bank and the World Bank.

Similarly, human resource capacity building is gaining momentum. In India, ITN operations are rapidly expanding. A project supporting an ITN center in Bangladesh was appraised by DANIDA for funding consideration. In Sri Lanka, an ITN center proposal is being developed, and an initial ITN identification mission for Nepal took place in June 1991.

The RWSG-SA works with WHO and UNICEF in the region by joining efforts in ongoing sector work and presenting workshops, such as one in late 1991 organized with WHO that focused on drainage. RWSG staff and UNICEF most often collaborate in the field of technology development, particularly in handpump field testing and demonstration projects that feature community management approaches.

The RWSG Technology Unit in New Delhi now holds responsibility for the Program’s tech-
nology promotion activities and support to private industry. These include technical assistance to manufacturers of handpump and sanitation hardware, development of quality control mechanisms, assistance to countries in selecting technologies, research and development of low-cost hardware, and feasibility studies for local hardware production. The Technology Unit also provided support in the past year to UNCDF, UNICEF, and Bank operations, and it is presently preparing a strategy paper for industrial support activities to the mid-1990s.

Urban environmental problems require great attention, especially in Bangladesh and India; and in most countries, solid waste management and drainage operations are fast becoming the predominant areas of work.

Now fully staffed and with a balanced mix of skills, RWSG-SA is prepared to meet broader challenges. The Regional core group includes two sanitary engineers, one human resource development specialist, and one sector planner with a background in sanitary engineering. The Technology Unit is made up of two mechanical engineers and one environmental engineer. The India team is staffed by two sanitary engineers, one financial and institutional specialist, and one communication specialist. The Bangladesh team is composed of two sanitary engineers; one planner and one coordinator for the activities of UNDP project RAS/86/160 (the Asia Sector Development Team). The Pakistan team consists of a country coordinator, one financial analyst, one sanitary engineer, and one community specialist (the financial analyst and a sanitary engineer are shared with project RAS/86/160). Overall, RWSG-SA has 6 international staff and 12 national staff members. The international staff are funded by the Norway Trust Fund, DANIDA, ODA, and UNDP. All national staff are funded under UNDP "INT" projects.

In November 1990, the Global Consultation on Safe Water and Sanitation (Safe Water 2000) was held in New Delhi. More than 600 participants from 115 countries and 60 external support agencies gathered to discuss the institutional, financial, and social requisites for the delivery of water and sanitation services. For the RWSG staff, the consultation offered a rich opportunity to interact with professionals from other countries and regions. Moreover, the strong consensus generated by the consultation added impetus to ongoing efforts throughout the region.

In most countries of the region, solid waste management and drainage operations are fast becoming the predominant areas of work.

Bangladesh

Despite limited natural resources and one of the highest population densities in the world, Bangladesh has progressed significantly, expanding water supply to cover 72 percent in rural areas and 37 percent in urban zones. As of early 1990, nearly 765,000 handpumps and over 900,000 household latrines had been installed by the government. In addition, there are also nearly 650,000 private handpumps. This achievement has been made possible by ideal hydrogeological conditions that permit installation of simple and cheap handpump-equipped tubewells in most of the country. Partners in this progress include the external support agencies (UNICEF, WHO, DANIDA, DGIP, and the World Bank) as well as the national and interna-
tional NGOs and community-based organizations that play an important role in promotion, community organization, and private participation—the critical efforts underlying production and installation of handpumps and pour-flush toilets.

The Program’s activities during 1990-91 concentrated on the following areas: (a) sector advisory support; (b) demonstration projects in community management and case studies that can be replicated through NGOs; (c) affordable community-based approaches to urban sanitation through support to IDA and DANIDA-funded projects; (d) capacity building and institutional strengthening through project monitoring and the establishment of an ITN center; and (e) design improvements of handpumps, production quality control, and establishment of a decentralized spare-parts manufacturing and distribution system.

In the rural water supply sector, the Program’s major achievement is the Tara pump support package, which includes a computerized performance-monitoring system and a caretaker training package. These training materials are used in the UNICEF-supported rural water supply program. RWSG-SA also assisted the Department of Public Health Engineering in preparing a rural water supply training and monitoring project that DANIDA has agreed to finance ($0.7 million). With the successful completion of the Mirzapur Community Management Project, the Program has finalized a case study and prepared a replicable model project for expanded implementation through NGOs.

Bangladesh’s fourth five-year plan sets a new focus on improving sanitation in both rural and urban areas. Recently, the Program completed a demonstration project on urban sanitation and held dissemination seminars in 75 municipalities. An urban sanitation strategy paper is being formulated to shape future strategic sanitation planning in the country. The new five-year plan will focus on promotion of the private sector and development of low-cost sanitation projects for urban centers. The Program also revised the sanitation activities of the ongoing IDA-funded projects in the cities of Dhaka and Chittagong.

The Program has carried out an assessment of human resources and prepared an International Training Network project proposal, with the Bangladesh University of Engineering and Technology as the host institute. DANIDA reviewed the proposal in late 1990 and agreed to contribute $0.8 million.
India's Expanding Training Network

To improve water supply and sanitation services for the world's second largest rural population, sector training in India needs to be strengthened. In pursuit of this objective, the International Training Network (ITN) embarked last year on an ambitious program of expansion in India. The ITN center in Calcutta began training activities in April 1991. Located in the All India Institute of Hygiene and Public Health (AIIPH), the center began offering courses in low-cost sanitation, operation and maintenance of rural water supplies, training for trainers, health aspects of rural water and sanitation, and rainwater harvesting. In 1991 alone, the center conducted more than 25 courses for over five hundred participants.

India's variety of languages and cultures and diverse physical environment complicate the task of human resource development and require substantial investment in educational materials. To build a national network, the ITN center aims to work with key institutions in every state in the country. Already, six institutions in Gujarat, Tamil Nadu, Karnataka, and Uttar Pradesh are formally included. Efforts have focused on developing a "twinning" strategy that matches institutions oriented toward hardware and software.

In three years, the India network is expected to include up to 30 institutions. Serving as a foundation for sector development, the India Department of Rural Development. The committee includes representatives of the United Kingdom and the Netherlands, network institutions, and a human resource development adviser from the RWSG, supported by the British Overseas Development Administration. ODA also supports an exchange program between the ITN and the Water Engineering and Development Centre (WEDC) of Loughborough University in the United Kingdom, which provides consultancy inputs and training in India and some overseas training for senior academics from key institutions.

More donor support will be needed to expand the India ITN network and to provide the means to build sustainable institutions, train future trainers, and develop educational materials. The government's commitment has already been demonstrated by progress over the last year, and India is ready to aid in the development of the ITN in neighboring countries. To that end, the ITN center in Calcutta will assist and support the new ITN center in Dhaka, Bangladesh, and Indian institutions will provide similar support to new ITN initiatives in Sri Lanka and Nepal.
RWSG-SA activities accelerated during the year as the rural water supply and environmental sanitation demonstration project in West Bengal moved into implementation. Populous and ethnically diverse, the project area is an excellent site to develop and demonstrate replicable community management strategies. RWSG staff have already completed an initial situation analysis, and planning for communications and training activities is in progress. Large-scale implementation will commence next year.

To increase coverage in rural areas, the RWSG-SA has also been helping the government to issue a project preparation manual for rural water supply and sanitation. The three-part manual focuses on the project cycle and the roles and responsibilities of users, project staff, and policy makers.

Several donor-supported projects are under way in the country, including the DANIDA-assisted, integrated rural water supply and sanitation projects in Tamil Nadu and Karnataka. The RWSG has given substantial support to these projects and has assisted the operations of the World Bank in preparation of rural water supply and environmental sanitation projects in Maharashtra, Karnataka, and Uttar Pradesh. RWSG-SA provides technical assistance to the World Bank and national agencies in the planning and implementation of low-cost sanitation project components in several other states.

The government has selected Goa State for a solid waste management and resource recovery project. Designed to demonstrate the benefits of community participation and community education in solid waste management, the project was approved by the government after it received a report from the RWSG-SA on management of municipal solid waste.

The RWSG staff is now developing a monitoring and evaluation system for the recently launched, nationwide program of low-cost urban sanitation. The aim is not only to provide needed improvements in sanitation but also to liberate the "waste pickers" who presently service bucket latrines. In the town of Vadodara in Gujarat State, the RWSG-SA has also prepared an urban environmental sanitation project to demonstrate community-based delivery of basic services in selected slums. The project will be implemented through a local nongovernmental organization.

To promote human resource development and training, the RWSG-SA has linked numerous training institutions to the ITN center at the All India Institute of Hygiene and Public Health in Calcutta. This has been achieved with financial assistance from ODA and DGIS. The Program is also assisting in a training assessment in the urban subsector.
Nepal

The RWSG-SA began expanding its work in Nepal in late 1989 based on a plan of action developed with government authorities, the World Bank, and WHO, with UNDP support from RAS/86/160. In collaboration with WHO, RWSG-SA has prepared a rural water supply and sanitation sector review, along with a development strategy and action plan for the 1990s. This will form the basis for planning and soliciting external support for the sector in the coming years. A donor consultative meeting will review the sector development strategy during the next fiscal year. RWSG-SA has also assisted the government and donor agencies in preparing new technical assistance projects for rural water supply and sanitation sector planning, urban low-cost sanitation, and staff training and reassignment. RWSG-SA assistance in Nepal will expand in the coming year to encompass an ITN linkage and to support new investment projects funded by the development banks and bilateral agencies.

Pakistan

Program activity in Pakistan started in 1987 with a rural water supply and environmental sanitation sector review, prepared in collaboration with the World Bank and CIDA. This was followed by a sector workshop and policy conference in April 1988. As a result, strategy and investment planning is under way, culminating this year in the completion of provincial strategic investment plans for rural water supply and sanitation throughout the country. Presently, country efforts focus on the implementation of projects funded by the World Bank, the Asian Development Bank, DGIS, KfW, and other agencies.

RWSG-SA has assembled a small, interdisciplinary team of national professionals to promote policy reforms and new investments in the sector and to coordinate external and domestic support. With funding from UNDP and UNICEF, the country team is establishing a national technical support cell within the Ministry of Local Government and Rural Development to provide guidance and technical assistance to provincial governments. At the national level, a policy review committee has been established to guide sector development and to assist communication between donors and the government.

The unserved population is growing rapidly in poor urban areas where environmental sanitation and drainage are major problems, but initial results of community-based approaches are encouraging. NGOs have demonstrated their ability to mobilize communities to construct and manage infrastructure services—including waste management—in squatter settlements.

The Program’s country team is exploring ways to incorporate community management approaches and NGOs into larger investment projects. To reinforce this approach, and to lead to practical demonstrations, the team is supervising applied research that examines the role of women and technology options in urban sanitation. Finally, the establishment of an ITN center in Pakistan will be investigated during the coming year.

Sri Lanka

Program activities in Sri Lanka have focused primarily on handpump standardization. But during 1990-91, RWSG staff initi-
ated several new activities, including participation in evaluation and appraisal missions to FINNIDA-funded rural water and sanitation programs. UNDP and the World Bank have requested the RWSG to monitor water and sanitation plans for three districts in the southern part of the country. This work will result in a 10-year development plan for these areas and an investment program for donor funding. Next year, RWSG-SA will assist the government in developing a water and sanitation sector strategy that will improve donor coordination and funding of new projects by the World Bank and ADB.

To complement this sector development work, the Program has assisted the National Water Supply and Drainage Board in organizing a workshop on handpump standardization. DANIDA, FINNIDA, GTZ, and UNICEF joined these efforts. The workshop resulted in a consensus for standardization on two handpump models. Standard drawings and specifications are now being finalized, and funding for industrial support to manufacturers is being secured from bilateral sources.

Human resource development is becoming a key part of sector development plans in Sri Lanka. RWSG-SA held discussions during the past year with the government and various technical training institutions to explore the possibility of establishing an ITN center in the country. Negotiations with one institution and a local NGO continue with the aim of opening an ITN center during the next fiscal year.

**Handpumps: Breakthroughs in Performance and Savings**

Alongside the successful development of the Tara handpump, which was adopted nationally in Bangladesh and is now used around the world, the Program has concentrated on refining other designs to make them cheaper and more reliable to operate.

The result of these research efforts, the newly developed India Mark III deepwell handpump sets new standards for ease of operation and maintenance. Since there is no need to pull out the rising main and cylinder to replace cupseal or piston or to check valve assembly, the new pump is easy to maintain. Because it is now possible for a village mechanic to carry out most Mark III repairs, downtime is reduced, maintenance costs are lower, and there is little need for mobile team intervention.

The India Mark III is being adopted by countries around the world, including China, India, Nigeria, and Uganda. Further development work continues on handpump designs that are in the public domain. As a result, the specifications of Afridev deepwell and Tara direct action handpumps are now being revised. One research project, to be undertaken with the Consumer Research Laboratory in the United Kingdom, will test uPVC rising mains and solvent cement more suitable to field conditions.

In conjunction with the government of India and UNICEF, the Program has also played an instrumental role in design improvements to the India Mark II deepwell handpumps. As a result, the largest-ever field modification program, involving over 1.5 million India Mark II handpumps, is now being carried out by the various state governments in India. When implemented nationwide, the new improvements in the India Mark II will result in substantially reduced maintenance costs and frequency.

In May 1990, a national workshop sponsored by the Indian Department of Rural Development and cosponsored by UNICEF and RWSG-SA endorsed the field modification of the existing 1.5 million India Mark II deepwell handpumps and adoption of India Mark III handpump on all new deep borewells. The Bureau of Indian Standards also published national standard specifications on the India Mark III and modified India Mark II handpumps.
More than half of the world's population lives in East Asia and the Pacific. Continuing population growth and rapid economic development are creating severe pressures on the social and environmental infrastructure in many countries of the region. A large number of the poor live without even the most basic water supply and sanitation services.

The RWSG for East Asia and the Pacific focuses especially on the region's low-income groups. Together with governments and other development agencies, the RWSG works to formulate comprehensive technical assistance strategies to achieve sustainable development in the region. Many country activities predate the opening of the regional office in 1989. The Program's primary activities in China and Indonesia have been under way for almost a decade. Secondary activities in the Philippines, Thailand, Mongolia, and Viet Nam were launched in the past few years. RWSG-EAP maintains a small regional staff in Jakarta and country offices in Beijing and Jakarta, staffed mainly by local experts with expatriate support. The International Training Network is active in the Philippines and Indonesia, and new ITN activities in China are now being formalized.

The Program has recently embarked on new initiatives and collaborative work in several other countries. In Viet Nam, a joint UNDP-World Bank-WHO-PEPAS (Regional Center for the Promotion of Environmental Planning and Applied Studies) reconnaissance mission is formulating an action plan on waste management and resource recovery. The infrastructure division of the World Bank's Asia Country Department II has also sought Program assistance in undertaking a rural water supply and sanitation study. In Laos, the Program trained technicians in the construction of rainwater catchment systems in cooperation with the team based in Bangkok as part of project RAS/86/
An updated sector master plan for Laos is currently being discussed and the Program's role is being defined. In Singapore, the RWSG-EAP held discussions with the Ministry of Foreign Affairs to encourage experts in the Ministry of the Environment and the Public Utilities Board to participate in Program activities. The issue is currently under review by the government.

Regionally, the Program conducted a high-level seminar on integrated waste management in July 1991 in Singapore. Twenty senior policy makers from 11 countries examined policy options to encourage wider use of resource recovery in national waste management strategies. The workshop was conducted in close cooperation with WHO-PEPAS, and PEPAS is now planning a follow-up workshop in Kuala Lumpur.

Reports on activities in individual countries during 1990-91 follow.

China

The Program's work in China started eight years ago with technology research and development, demonstration projects, and investment support through UNDP projects INT/81/026, INT/87/013, and later CPR/88/011. These activities have expanded into policy advisory work at the national level and projects targeting low-income groups estimated at 100-150 million people.

In poor rural communities, the Program has been actively promoting water supply based on community-managed handpumps as an alternative to piped water systems. Following laboratory and field tests in Beijing, Hunan, and Shanxi on various local and imported handpumps, demonstrations were carried out in Hebei, Inner Mongolia, and Xinjiang. The handpumps have proven to be an effective choice. Durable and popular among the users, they are probably the only sustainable and affordable system in remote rural areas. Standardized handpumps are now being manufactured under strict quality control in two regions.

The successes in Inner Mongolia and Xinjiang with locally produced handpumps and with low-cost sanitation technologies were important milestones toward large-scale replication. Project CPR/88/011 has made impressive progress in building institutional capacity in the two regions as well as at the national level. The feasibility of extending water supply to millions of poor, rural inhabitants has also been demonstrated. Financial support from Germany provided through GTZ underwrote these groundbreaking activities.

Building on the project work carried out under Rural Water Supply and Sanitation I and CPR/88/011, the Program aided in the appraisal of an IDA-financed $120 million rural water
supply and sanitation project to benefit an estimated four to eight million people in the provinces of Inner Mongolia, Xinjiang, Yunnan, Hunan, Guangzhou, and Gansu. More than 50 percent of this population will be served through new low-cost water and sanitation systems.

Program activities in waste management began in 1982 with advisory services and the evaluation of Shanghai resource recovery operations. This led to the Program's involvement in the Guangzhou landfill project, which was carried out with German financial support through GTZ. The Chinese government has since designated the Guangzhou landfill a national environmental demonstration site, and the Program's productive collaboration with the Ministry of Construction continues.

China is working to develop a waste management strategy that makes full use of resource recovery opportunities. Through new demonstration and training activities in the poorer sections of urban centers, the Program will be assisting the Ministry of Construction in improving solid waste management via more efficient, safe disposal and recycling. A workshop on urban solid waste management was conducted in Zhuhai in July 1990.

International Training Network centers are being established to support the demonstration activities through the training of sector professionals, technicians, and trainers. Two training network centers, one for water supply and sanitation and the other for waste management, have been selected and funding is being arranged.

A new project funded by UNDP—CPR/91/141, Capacity Building and Investment Preparation for Rural Water Supply and Sanitation in Poor and Remote Areas—was recently approved by the government and UNDP. It supports the adoption of sound implementation strategies and policies and promotes technology transfer, institution building and training, and demonstration of proven approaches and technologies. Linked to the IDA-assisted Rural Water Supply and Sanitation II, the project will support the integration and replication of low-cost systems on a nationwide basis.

During the past year, the Program has also participated in a variety of other activities for sector development. A national Drilling Rigs Workshop was organized as the final activity under project CPR/88/011. It was attended by 35 drilling rig manufacturers and other counterparts professionals. Collaboration continues with Guangzhou municipal authorities on the Dae Tian Shan demonstration and sanitary landfill-gas recovery site. The Program is also providing technical advice to the Bank-assisted Beijing and Tianjin environmental projects.
Program activities aimed at promoting improved sanitation in Indonesia began in the early 1980s with demonstration projects and an information campaign. Working with the Department of Public Works and the Department of Health, Program staff have hastened the development of environmental sanitation in poor communities by assisting the government in improving sector policies, developing guidelines, improving management, and building institutions. The Program is now broadening its support to encompass rural development, women's participation, environmental management, and investment activities, and it is expanding coverage on a large scale through financing from the World Bank.

A prime example of this process is the Community Water Supply and Sanitation Project (INS/88/005), the RWSG's primary demonstration activity, which is supported by UNDP and the Dutch government. The project assists in the development of policies and guidelines for community water supply and sanitation planning and implementation, and through social marketing approaches seeks to increase public awareness and demand for services. Key staff from local government offices are trained in strategic sanitation planning, implementation of demonstration projects, and applied research methods that support demonstration activities.

By 1990, INS/88/005 was in full operation with demonstration activities in Sidoarjo (East Java) and Badung (Bali), and the institution-building and social-marketing components of the project were under way. Workshops were held in 1990-91 in Ciloto, Solo, and Malang to acquaint local officials with the issues associated with large community-based sanitation projects.

Building on this experience, the Program is increasing its involvement in planning and ex-
ecution of another project: Water Supply and Sanitation for Low-Income Communities (WSSLIC), a new, Bank-assisted undertaking that focuses on community development and management. The $100 million project draws on lessons from a workshop organized by the Program in January 1991 to assess field experiences in implementing community-managed projects. As a result of the workshop, sector policies and guidelines in Indonesia are increasingly being reshaped toward community management.

The Program will provide similar support for a parallel project financed by the Asian Development Bank; for the World Bank-financed Third Health Project; and for the East Java-Bali Urban Development Project, where Program concepts for community management, capacity building, and credit mechanisms will be applied.

The RWSG-EAP recently participated in the formulation of a national solid waste management strategy and in the preparation of solid waste management systems for 75 districts in Jakarta, thus promoting widespread use of low-cost, on-site sanitation in current investment projects. Indonesia's Fifth National Development Plan reflects this emphasis on low-cost sanitation in urban and rural areas.

With Program support, Indonesia has also made rapid strides in capacity building. Two International Training Network centers are fully operational (Institute Teknologi Bandung and Cipta Karya) and Bahasa language adaptations of the ITN training materials are being used. The supporting project, which is entering its third phase of operation, is funded jointly by the Indonesian and Dutch governments and will continue to support ITN activities at Cipta Karya under the Ministry of Public Works and at the Institute of Technology.

The project will be supervised by an interministerial group and the Community Water Supply and Sanitation Project.
Mongolia

One basic aim of the government is to improve rural living conditions rapidly. However, the national and local governments need assistance in planning and carrying out a nationwide rural water supply and sanitation program.

Following the government’s request to UNDP (Ulaanbaatar), a UNDP-World Bank mission was sent to identify rural water supply and environmental sanitation technical assistance projects. The mission’s project identification report submitted to the government, UNDP, and the Program includes numerous activities: demonstration of low-cost water and environmental sanitation technologies such as handpumps, ventilated improved pit latrines, and water treatment; a hydrological pilot study in the Gobi zone; training programs on sector planning, project management, hydro-geology, well drilling, operation and maintenance, and other topics; assistance in the formulation of a water quality program; and assistance to local handpump manufacturers.

Philippines

The government’s strong commitment to safe and dependable water supply and sanitation facilities is manifested in the “Water Supply and Sanitation Master Plan, 1988-2000.” To help meet master plan objectives, the Program has been building national capacity to plan and construct community-based water supply and environmental sanitation systems.

Program assistance focuses on raising awareness among practicing engineers of appropriate technologies and approaches, and on assisting educational institutions in revising curricula to respond better to sector needs.

The newly established International Training Network center, which is boosting these activities, became fully operational in 1990. ITN-Philippines is a collaborative venture of sector and educational institutions led by a core group composed of the Local Water Utilities Administration, the Department of Health, the Project Management Office for Rural Water Supply of the Department of Public Works and Highways, the College of Engineering (University of the Philippines), and Tulungan sa Tubigan (an NGO). Other private, public, and nongovernment institutions also participate in its activities, and local and external funding up to 1994 has been secured.

The Program also continues to provide assistance through Bank-supported investments and planned country projects. RWSG-EAP staff are improving Afridev handpump manufacturing and internal quality control, well construction techniques, and hardware specifications, and are aiding in the introduction of Tara direct-action pumps.
Thailand

Thailand is endowed with abundant water resources, although some areas in the north-east have a prolonged annual dry period. The government has a long-established rural water supply and sanitation program, with responsibilities divided among several sector institutions. Efforts are now under way to improve performance and coordination among these institutions. To support these efforts, the Program is helping the government to formulate sound sector strategies and establish a national and regional policy framework for the provision of services to poor rural communities.

Work on handpump standardization and successful community maintenance systems was completed in 1990. To reduce dependence on unreliable centralized maintenance, the project (THA/87/002) promoted the use of handpump designs that incorporate VLOM features. Program staff prepared a study to persuade sector agencies of the benefits of minimizing the number of handpump designs in the country. The study also recommends formal adoption of national specifications with strict quality control and encourages competition among private manufacturers.

The National Economic and Social Development Board and the World Bank have endorsed a Program mission to prepare a project document and action plan that will apply nationally the lessons from THA/87/002 and other technical assistance projects.

Waste management has become a pressing issue in Thailand, which up to now has not taken sufficient advantage of resource recovery opportunities. This key issue is high on the agenda for future Program collaboration with the Thai...
Latin America

One person in four still lacks access to adequate drinking water in Latin America, and two out of five have no facilities for disposal of human waste. The urban population will exceed 400 million by the year 2000, an increase of 66 percent over 1985, and at least half of these persons will live under precarious conditions in shantytowns. Despite a small, expected decline in the rural population, the service coverage deficits in rural and urban areas will remain large at the end of this century.

The Program is addressing these problems in a select number of countries by promoting low-cost and intermediate technologies, building community-level capacity with the help of PROWLESS, and strengthening human resources and institutions through the International Training Network. When a critical mass of activities has been reached, the Program will establish two regional networks, one in South America (based in Bolivia) and one in Central America (based in Guatemala). They will be similar to the RWSGs in structure and function and will manage regional operations, as recommended by the Program Assessment Report.

The Program is working closely with the World Bank’s LAC operations departments to coordinate sector activities in the region. Collaboration is currently being organized with UNICEF, UNDP, USAID/WASH, PAHO, and bilateral agencies to provide sector coordination and technical support in Central America—support that is closely linked to development of the various national social investment funds.

During the past year, the Program established an in-country Coordination Unit in La Paz, Bolivia, to supervise and manage two new projects. The first of these is a rural water and sanitation demonstration project in the Department of Potosi, funded by the Dutch government. Built on the
Program's initial work with handpumps and community participation in Oruro Department, the new project aims to develop a sustainable rural water and sanitation strategy through the provision of facilities to about 75,000 people. The second project involves supervision of two periurban water and sanitation pilot schemes in Cochabamba and Santa Cruz, as part of the World Bank-Government of Bolivia Integrated Health Project.

In 1990 the Program participated in the 22nd AIDIS Congress (Asociación Interamericana de Ingeniería Sanitaria y Ambiental) in Puerto Rico and presented the TAG (Technical Advisory Group) computer-based design programs for water and sewerage networks.

To address the need for capacity building, Spanish versions of the ITN training materials were prepared by CEPIS, the Centro Panamericano de Ingeniería Sanitaria y Ciencias del Ambiente. Currently, several case studies that highlight issues specific to the region are being finished and distributed.

Reports on activities in individual countries during 1990-91 follow.

**Bolivia**

Bolivia has the third lowest water service level and the second lowest sanitation service level in the western hemisphere. It also has the highest infant mortality rate and the lowest life expectancy in Latin America: 54 years (34 years in the Department of Potosi). Low service levels are particularly acute in the rural areas (where more than half of the population lives) and in the rapidly expanding slums surrounding Bolivia's cities. Only 24 percent of the rural population is served by potable water systems. The urban population is doubling every 16 years.

Program activities in Bolivia began in 1982 with field testing of handpumps throughout the country. Then in 1988-89, the Program carried out a project in the Department of Oruro to produce and field test local handpumps in 60 dispersed rural communities. The Program provided technical assistance for the national production of direct-action Yaku handpumps based on the Tara design from Bangladesh. Working with PROWESS and local NGOs the project demonstrated the ability and willingness of small communities to manage and finance their own water supply.

The Oruro handpump project demonstrated the ability and willingness of small communities to manage and finance their own water supply.

Building on the experiences of Oruro, a larger project was subsequently prepared for the Department of Potosi. Bolivian authorities approved the project in 1990, and the government of the Netherlands provided the financing. Operations began at the end of 1990 with the establishment of an in-country Coordination Unit. The Potosi project is working closely with the Regional Development Corporation and the Directorate of Sanitation of the Ministry of Health to develop sustainable water and sanitation services for more than 75,000 people. Monitoring and documentation are being undertaken to ensure that the results can be used in policy and strategy formulation at the national and regional levels.

The Program also participated in identifying and appraising water and sanitation components of an integrated health development project financed by the World Bank. Periurban sanitation projects in the cities of Cochabamba and Santa Cruz are...
Brazil

The Program has provided sector advisory support to the World Bank-financed Northeast Rural Development Program and is assisting in the preparation and supervision of the Rural Water Supply and Sanitation Project. Program staff also developed links for technical cooperation between Brazil and Bolivia for the local production of handpumps.

In the past year, the Program has launched support to the technical assistance component of a new $100 million, World Bank-funded water supply and waste disposal project, aimed at the underserved in selected municipalities across Brazil. The project will develop and test new guidelines for project implementation and monitoring. The work focuses on documentation and analysis of appropriate technology design standards, cost estimates, selection criteria, and operation and maintenance requirements.

The Program will also evaluate current institutional arrangements and the potential for community and private sector participation. This project is being carried out in close collaboration with Brazilian research institutions and will provide a comprehensive framework for data collection and synthesis.
Central America

Central America’s economic and social situation deteriorated steadily during the 1980s as a result of recession, civil unrest, and natural disasters. Public spending on infrastructure has fallen even though the population, particularly the urban population, is increasing rapidly, typically more than three percent per year. The provision of water and sanitation has barely kept pace with population growth, and services in most periurban and rural areas are wholly deficient.

To address this crisis, the Program has launched a new initiative to enhance cooperation and coordination among sector agencies. A mission made up of representatives from the Program, UNICEF, USAID/WASH, PAHO, and WHO visited El Salvador, Nicaragua, Honduras, and Guatemala. The working group identified extensive support and endorsement for three proposed common objectives: to facilitate the exchange of information and experiences, to provide access to external technical assistance, and to promote appropriate technologies. In the next year, the Program will play a key role in developing this collaborative program by establishing a core group of regional specialists. Beginning at the regional level, this support should help foster national activities through capacity building, resource management, policy development, and sector planning—making a valuable contribution to sector development in all seven countries of Central America. Regional activities will parallel the Program’s assistance to specific countries that are using national social investment funds being established by the World Bank.

With UNICEF, the Program is already assisting in Guatemala in the production of a simplified, direct-action handpump called the Maya, based on Bolivia’s adaptation of the Tara. Both Latin models are now being exported, and regional demand is growing. Plans are also set to establish similar production plants in El Salvador and Honduras. And, as in Bolivia, strategies are being considered to establish a new RWSG to maintain and expand Program activities in the subregion, as recommended by the Program Assessment Report.
The Program has principally been involved in waste management and resource recovery in the EMENA region. Planning in water supply and sanitation for rural and low-income urban areas is advancing along an exploratory path, as the Program worked during the past year to plan and implement regionwide activities. Country-specific collaboration on water and sanitation demonstration projects and preinvestment activities were identified for further work in the coming year.

Over the long term, the Program aims to assist countries of the region in rural water supply and sanitation, human resource development, water resource management, urban sanitation and waste management, and promotion of interagency collaboration at the country level. The Program continues to work with governments, NGOs, ESAs, and the World Bank in executing this set of activities related to regional and global objectives.

To foster regional coordination of research and project implementation, a Rural Water and Sanitation Group for EMENA is being planned that would emulate the other RWSGs in scope and function. Under UNDP project RAB/88/009, work is proceeding on the improvement of water supply, sanitation, and waste management in the Arab States region. The project is helping to stimulate the development of sector services through a variety of activities: conducting surveys of existing facilities and present and projected needs; promoting greater interagency collaboration in operations and research; identifying suitable country projects; developing human resources through the preparation of training materials; and organizing national and regional workshops on wastewater reuse and waste management.
Promoting Indigenous Waste Management Strategies

Looming water shortages and pollution from improper waste disposal are two principal challenges to sector development in the region. The urban and rural poor are the most affected. Slum dwellers are faced with uncollected garbage and rat-infested neighborhoods, and farmers on the urban fringe must use untreated wastewater to irrigate their crops. Over the past five years, countries throughout the region have focused attention on improving the collection of solid and liquid wastes, primarily in major urban areas. Greater support to more “home-grown” solutions is required to ensure that these plans include services for small towns and low-income urban and rural areas.

The region is composed mostly of middle-income countries that report urban water supply and sanitation coverage rates between 70 and 100 percent. In most countries waste management is a municipal responsibility while in others it is a combined responsibility of local authorities and private enterprise. But rural areas are much less well supplied, with national coverage rates under 30 percent in many countries. One priority for action, therefore, is improvement in quality and quantity of rural water supplies and the development and promotion of adequate rural sanitation systems.

Success will require strong partnerships at two levels. First, countries in the region must pursue coordinated strategies for research and implementation of innovative projects. This should include the exchange of information on appropriate wastewater treatment technologies and on the formation of community associations for delivery of water in rural areas. Second, most of the problems hindering water supply, sanitation, and waste management services in the region are multisectoral, and their solution at the policy and project-implementation levels requires an interdisciplinary approach. In EMENA, most water issues in the rural areas (and even in the urban areas of some countries) come under the responsibility of ministries of agriculture or irrigation. Although the need for interdisciplinary approaches is widely acknowledged, integrated rural development projects ironically have often been criticized for being too complex. Greater community participation could well be the planning ingredient that allows the necessary integration by defining priorities in rural development projects according to local needs.

Waste Management and Resource Recovery

In countries throughout the region, the available water resources are barely sufficient, and at current rates of use, severe water shortages could occur within the next decade. Moreover, agricultural demands compete heavily with domestic and industrial uses, straining scarce resources. New studies will focus on specific problems, such as more efficient use of water in industry and reducing unaccounted-for water in municipal water supply operations. Adopting stricter management controls is an essential component of conserving scarce resources. Master plans for water resources exist in most Arab countries, but action plans to implement them are either nonexistent or lack financing.

To maximize the use of water resources, the Program is developing strategies for wastewater reuse. Currently, most wastewater is collected from public sewerage systems where a high volume of water is consumed. Future efforts will concentrate on developing systems that require lower volumes of water. To achieve greater overall efficiency in wastewater reuse, the Program will provide institutional advice to enhance efficient distribution, develop pricing guidelines for effective cost recovery, and study the potential for artificial recharge of groundwater using treated wastewater.

Through collaborative applied research in liq-
uid and solid waste management, treatment, and recycling, the Program is assisting countries in developing comprehensive policies aimed at wastewater reuse and solid waste collection and disposal. A country-by-country report on wastewater reuse is scheduled to be presented for government approval next year. This multiagency effort includes both regional and country dimensions. It proposes a regional framework for intercountry distribution of research, training, and demonstration projects. Country-specific preinvestment activities are also being proposed that link reuse to the expansion of sanitation networks, especially in large urban areas. The Program is already collaborating in these activities in Cyprus, Egypt, Morocco, and Tunisia.

Human Resource Development

Adaptation and Arabic translation of eight of the Program's ITN training modules have been under way during the past year. They are scheduled to be distributed for use in the coming year, and work will begin on the second series of materials. The modules provide information on appropriate, community-based technologies for water supply, sanitation, and waste management. In addition, the Program will organize and participate in regional and country meetings on these issues.

Rural Water Supply and Sanitation

Although modest, the efforts toward improving rural water supply in Morocco and rural sanitation in Yemen are significant. Improved knowledge of local conditions allows the Program to determine appropriate approaches and, whenever possible, to transfer its experience with sector development into practical local programs. In surveying the rural water and sanitation needs of these water-short communities, the Program focuses on promoting the role of women in water supply, stimulating cost recovery, and strengthening the linkages between health, area economics (mainly agriculture), and water and sanitation.
Annex: 1990-91 Program Outputs

Articles


Working Papers


Program Discussion Papers


Program Reports

Papers


Reports


Proceedings

“Proceedings of the National Workshop on Potential Improvements in India Mark II Deepwell Handpump Design.” May 24-25, 1990, New Delhi, India.

Training Materials


Publications


Feedback Between Headquarters and Field Staff, June 1990.

Feedback Between Headquarters and Field Staff, December 1990.

Feedback Between Headquarters and Field Staff, June 1991.


Water and Sanitation UPDATE, September 1990.


**Infrastructure Notes**


