PREFACE

This report describes the activities of the UNDP-World Bank Water and Sanitation Program during 1988. It is the first comprehensive overview of all aspects of Program activity and reflects the consolidation in 1988 of formerly separate projects into one cohesive Program. This organizational tightening demonstrates our belief that the sustainability of water and sanitation services depends on the integration of water supply, sanitation, waste management, and health education components. It reflects the importance of linking the Program’s operational and research activities, as well as the need to view all of what we are doing in light of growing environmental concerns.

The report leads off with a description of the Program, including its history and goals for the future. This is followed by a discussion of the Regional Water and Sanitation Groups, a new vehicle for delivery of services at the regional level. A summary of the global research activities of the Program is next, followed by a summary overview of the new Framework for Global Cooperation and a description of bilateral contributions to the Program. The report concludes with accounts of Program activities in individual countries during 1988, grouped into regions.

A more in-depth view of overall Program strategies within each country can be found in the latest edition of the “UNDP-World Bank Water and Sanitation Program Country Work Plan 1988-1990,” published in March 1989. An increased country focus is an important goal of the Program. In the near future we would like to see inputs from other agencies, as well as from bilateral donors, into the Program’s country work plans. The goal is to establish them as comprehensive strategies for extending coverage at the country level.

The sector faces a turning point as the International Drinking Water Supply and Sanitation Decade nears its close and the Framework for Global Cooperation emerges. Despite the fact that Decade efforts have fallen short of goals, much has been learned about appropriate technologies, the need for interaction with communities, and the importance of education in making water and sanitation services sustainable. As a Program, we have reorganized to take on the tasks that lie ahead. We must now use the lessons learned from Decade experience and our improved organization to increase the delivery of services into the 1990s and beyond.

Curt Carnemark
UNDP-World Bank
Water and Sanitation Program

ANNUAL REPORT 1988
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THE UNDP-WORLD BANK WATER 
AND SANITATION PROGRAM

The UNDP-World Bank Water and Sanitation Program is a key component in the global effort to bring clean water and better sanitation to those most in need in the developing world. Less than half the population in the world’s developing countries has access to an acceptable water supply, and only about one in five to satisfactory sanitation or sewerage services. Thirty-five thousand die every day from diarrheal diseases. Invariably, those who suffer the most are the poor. They generally live farther from water sources, lose more productive time carrying water, and suffer more infant deaths from waterborne diseases.

But the prospects of the poor are brightening. In 1980, with about 2 billion people lacking adequate water and sanitation worldwide, the UN General Assembly proclaimed 1981-90 as the International Drinking Water Supply and Sanitation Decade (IDWSSD). It urged governments to accept the challenge of extending water and sanitation services to all of their people by 1990. The international donor community was asked to support government efforts with financial resources, technical know-how, and aid coordination. The cost of serving 2 billion people with conventional piped water and sewage systems was estimated at a staggering $600 billion. Other barriers to widening water and sanitation coverage were fragmented sector policies, weak or nonexistent institutions, lack of adequately trained people, inappropriate technologies, little community involvement, inefficient operations and maintenance, and the absence of effective means of mobilizing financial resources.

UNDP, WHO, UNICEF, and the World Bank led the Decade effort in the international community to attack these constraints. UNDP assumed overall leadership at the global and country levels. WHO helped government efforts by setting up National Action Committees and formulating strategies. UNICEF supported community water supply and sanitation programs. The World Bank took responsibility for developing and promoting low-cost alternatives to conventional water supply and sewage systems, including helping governments to better prepare investment projects and to obtain investment financing.
The UNDP and the World Bank began developing and field testing affordable technologies in 1978 when they realized that global investment to achieve full water and sanitation coverage could be reduced by some $400 billion with lower service standards and widespread use of low-cost systems. When the Decade was launched, the Program expanded into a global effort to help bring basic services to low-income groups on a large scale. In some countries, this meant linking up with ongoing government programs; in others, it meant helping to start up such activities, with the ultimate aim of bringing them to national scale.

Part of the UNDP-World Bank Program’s approach is to develop innovative implementation strategies for extending service coverage to low-income groups that can be replicated on a national scale. These demonstration projects use low-cost technologies and involve communities, especially women, in the design, management, and financing of facilities. For example, in Lesotho, as part of a national program for rural sanitation based on self-help and health education, more than 200 local artisans have received certificates in latrine building. A fifth of them are women. In a rural water supply and
sanitation project in the Kwale District of southeastern Kenya, the charismatic leader of a nongovernmental organization has taught management and hygiene education to community water committees made up mainly of women. In Indonesia, a sanitation improvement demonstration project covering eight urban areas on the island of Java has provided families with credit to build latrines. The loan is repaid over three years into a community revolving fund, which in turn provides credit to more families. In Bolivia, water and sanitation programs for squatters in La Paz and several other cities have been based on neighborhood associations.

The Program conducts applied research and executes individual country programs that include demonstration projects, initiatives to foster cooperation among governments and support agencies, training activities, and help in the design and implementation of large-scale investments. Although working closely with the Bank’s lending operations, the Program does not lend money itself. Its core funding comes from UNDP, but additional money has been supplied by ten bilateral donors: Norway, Switzerland, Canada, the Federal Republic of Germany, France, the United Kingdom, Finland, the Netherlands, Italy, and Denmark. These, as well as others, notably Sweden, fund activities directly. The Program is active in more than 40 countries and will use some $30 million in resources from 1988 through 1990.

The world is still far from the Decade goal of clean water and adequate sanitation for all by 1990. Widening of coverage has been minimal. Indeed, efforts to reach more people often turn into a struggle to hold the line against a drop in the share of people served. Exploding urban populations are pushing up demand for services while making safe water more costly because of pollution. At the same time, global and local financial

In Lesotho, a village-trained local latrine builder lines a latrine pit with stones. Builders are private entrepreneurs paid directly by consumers for their services, thus adding an important income-generating component to Lesotho’s National Rural Sanitation Program.
resources are shrinking due in part to the debt crisis in some countries and to shifting priorities in others.

The Program has helped to build donor support and political commitment for low-cost water supply and sanitation projects and focused international attention on Decade goals. It has helped develop an array of technological and strategic tools for implementing these systems nationally and is moving toward countrywide action.

The newly created Framework for Global Cooperation (described more fully in Chapter IV) is an outgrowth of external support agency efforts to better mesh their activities. It will serve as a vehicle for more effective external assistance in the 1990s and beyond to provide sustainable water and sanitation services to low-income groups. The UNDP-World Bank Program has an important role to play in assisting the Framework in its efforts to maintain the momentum of the Decade beyond 1990.

What the Program Did in 1988: from Methodology to Large-Scale Demonstration

While the Program expanded and decentralized in some respects in 1988, it consolidated in others by integrating the formerly separate projects of the Program into one cohesive group. It tightened its organization and decentralized as much work as possible to the regional and country levels through newly built up Regional Water and Sanitation Groups (RWSGs). It also decided to limit major activities to 12 to 15 countries of primary focus where the need is greatest and governments are firmly committed to the Program's concepts and integrated approach. Limited support will be given in other countries. A comprehensive work plan was drawn up outlining overall Program strategy and activities at the country level. The plan, developed by the RWSGs and reviewed by the Bank's operational staff as well as governments, is a management tool to monitor progress of field activities and to ensure coherence of regional and country-level operations with the overall Program strategy. Details of the strategy are provided in the Program publication "Towards Equitable and Sustainable Development: A Strategy for the Remainder of the Decade and Beyond."

Program concepts are increasingly working their way into large-scale World Bank-financed water and sanitation projects. After pilot projects in Indonesia demonstrated the feasibility and benefits of community participation and low-cost sanitation, the government included low-cost urban waste and wastewater disposal components in Bank-financed projects in Jakarta. It is expected that a new large-scale water and sanitation demonstration project in Nigeria will tie in with two Bank-financed projects, Water I and Water II, totaling $400 million, slated for 1992. In Bolivia, the Program is participating in a Bank operational mission to help prepare a public project for four cities that will include a low-cost sanitation component. In India, the Program is providing support to operational staff in identifying and preparing a major rural water supply and
A child gets water from an India Mark II handpump developed by UNICEF for Indian conditions. The Program has tested more than 500 Mark II handpumps for suitability in other developing countries.

sanitation project, focusing on, among other things, private sector involvement in project planning and implementation. The Program is working with the Bank's operational staff in Pakistan on a major water supply and sanitation project due for appraisal in October 1989. The project hopes to strengthen local government and provide credit and training to bolster nongovernmental organizations and village decision making.

Several demonstration projects were launched by the Program in 1988. The above-mentioned Nigeria project, a $5.5 million, five-state community water supply and sanitation demonstration, is exploring, among other things, the role of women in development and innovative ways to involve the private sector in well drilling. It is the largest in-country demonstration project in rural water supply and sanitation ever executed by the Program. In China, the Program is implementing two large demonstration projects in the Inner Mongolia and Xinjiang Autonomous Regions following a three-step strategy begun in 1983 based on technology development and field testing. The goal is to help formulate policies for extending coverage, particularly in the minority regions of the country that have a population of more than 100 million. The demonstration projects cover 200,000 people each and promote implementation of alternative systems, community management, and local manufacturing of handpumps. And in Indonesia, plans have been drawn up for a large-scale community water supply and sanitation demonstration in rural and urban areas to be launched in 1989.

The Asia Sector Development Team (SDT), separately managed by the Bank's Asia Technical Department, has clarified its role within the Program. The Asia SDT will focus on urban services delivered through municipal institutions; the remainder of the Program will focus on peri-urban and rural poor communities. The RWSGs have been strengthened with more staff and have developed work programs for effective operation. Plans are under way for establishing additional RWSG offices. See page 7 for details, as well as a description of the RWSGs' organization, management, and goals.
The Next Step: Speeding up Delivery

The Program's pressing mandate is to accelerate delivery of services to the poor at the country level. Although progress has been made, more operational work needs to be done. More demonstration of innovative approaches is needed to achieve national, regional, and global impact. Risks have to be taken in trying out a wider variety of mechanisms, other than conventional institutions, to deliver services to the poor, such as the increased use of non-governmental organizations (NGOs) and the promotion of the small-scale private sector. The Program has to bring these approaches into its new projects and find ways to expand them to a larger scale to see how they work at regional, state, or national levels. To these ends, the Program will work closely with NGOs to intensify social development activities, including the integration of women into decision making as well as operation and maintenance of water supply and sanitation systems.

The Program made progress in 1988 in defining an applied research agenda in the areas of rural water supply and sanitation, urban sanitation, and municipal waste management. But it needs to do more to strengthen the intellectual foundation of its work to tackle complex institutional, financial, social, and technical issues that hinder sustainability of services. Particularly, it needs to look at the water supply and sanitation sector more broadly in the context of the issues that are growing rapidly in importance. These include mounting concern over water resources, protection of the environment, and solid waste management. The Program needs to determine how its mandate fits into the overall effort to address these global issues, and if and how it should modify its mandate in response to the growing attention and financing focused on work in these areas. The Program will place more emphasis in 1989 on environmental and broader waste management issues, moving from research to operational activities as it has with sanitation and rural water supply. It also plans to sharpen its focus on urban issues as it expands its activities in Latin America and the Middle East.

Organizationally, the Program needs to recruit new staff to key positions both at headquarters and in the regions. It needs to strengthen the South Asia RWSG and move forward with developing the teams in East Asia, Latin America and the Caribbean, and Europe-Middle East-North Africa. It is essential that the Program meet the difficult challenge of finding the numbers of experienced people needed in the right places. Especially crucial is recruiting national staff to work on rural water supply and sanitation projects to gain experience and translate Program concepts into concrete country programs. Also key to building local capacity is strengthening human resource development efforts in countries through the International Training Network. As one step, the Program is considering establishing a Fellowship Program under which selected young sector staff from developing countries would be posted in RWSGs for 12 to 18 months for on-the-job training that would expose them to a full range of Program activities. Only by building up local staffs, helping formulate and promote sound national strategies, and boldly exploring new ways to deliver services to the poor will the Program be able to make a sustained impact on the developing world.
Regional Water and Sanitation Groups: A New Approach to Sector Development

Perhaps the most important activity of 1988 for the UNDP-World Bank Program has been the strengthening of Regional Water and Sanitation Groups (RWSGs) both in West and East Africa, as well as the creation of a third group in New Delhi for South Asia. The RWSGs, located in sites with established communications services, usually attached to the World Bank resident missions, will be the focus of Program field operations in the future. In the fall of 1989 a RWSG for East Asia will be established, while a group for Latin America and the Caribbean may be initiated by the end of 1989.

The RWSGs represent a novel approach to international technical cooperation. Comprised of multidisciplinary teams of five to ten sector specialists, they are able to help governments in a full range of sector development: from overall sector planning and strategy formulation to the design and implementation of investment projects. Their goal is to develop, through working with individual country governments, the institutional capacity for large-scale investment in the sector.

Funded by UNDP and other donors, the teams bring together in strategic locations the expertise that was previously scattered among separate projects during the early years of the International Drinking Water Supply and Sanitation Decade. Faced with fragmented sector policies, together with weak or nonexistent sector institutions, widespread shortages of trained manpower, and inappropriate technologies, those involved in the Decade during the early years found it difficult to set priorities and to decide how to assist countries most effectively. The RWSGs are designed to coordinate these efforts, both among donors and with individual country governments with which they work closely.

The RWSGs are directed by managers within each region who have wide discretion and responsibility for day-to-day operations within the framework of agreed-upon country workplans. This decentralization ensures flexibility in meeting governments' needs. The groups are staffed by engineers, economists, financial analysts, and social scientists whose professional expertise is bolstered by access to consultants in specialized fields. Country coordinators or national project officers stationed in countries of primary focus manage and implement specific country activities and serve as liaisons between governments, UNDP, and the RWSGs.

RWSG activities are supervised and monitored by the World Bank's Water and Sanitation Division (INUWS) through the Program Manager and his staff. This ensures that RWSG activities are coordinated with the interregional elements of the UNDP-
World Bank Water and Sanitation Program. These include its applied research activities, information dissemination and exchange, waste management and recycling programs, and training activities of the International Training Network. INUWS also coordinates its work with and influences the World Bank's regional sector programs.

An important spin-off of the RWSGs is their potential for coordinating donor efforts in a particular country, in response to requests from governments. The need for such cooperation was clearly endorsed by a number of speakers at the Donor Consultative Meeting in the Hague in November 1988, during which the External Support Agency’s (ESA’s) Collaborative Council was formed. As the Decade winds down, the need for such mechanisms becomes increasingly clear.

Country Work Plans Mesh Sector Development With Implementation of Demonstration Projects

The RWSGs’ activities are defined in annual work plans drawn up by the RWSGs in consultation with governments, discussed with the World Bank regions and others, and finalized at headquarters. The work plan combines sector development with the planning and implementation of demonstration projects. As such it serves as a management tool both to monitor progress of field activities and to ensure coherence of country-level operations with the overall Program strategy. For further details see “UNDP-World Bank Water and Sanitation Work Plan, 1989-90.”

Striking the balance between planning and sector studies on the one hand, and implementation activities at the pilot, demonstration, or full-scale level on the other hand is a subject for much debate within the Program. Clearly both activities are needed: the first to develop the necessary policy and institutional frameworks and the second to
## LIST OF DEMONSTRATION PROJECTS

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*Note: Community water supply and sanitation includes both urban and rural areas.*
develop and demonstrate implementation strategies to provide sustained services on a large scale. Demonstration projects are an effective tool for governments to establish policies and strategies based on a “seeing is believing” approach.

During the past year, RWSG-East Africa (RWSG-EA) has concentrated on working with country governments to develop a methodology through which institutional capacity within the sector can be enhanced. It has developed a three-step approach to each country in which it is active. First, RWSG-EA prepares a position paper on the sector as a whole. This step is followed by the development of a sector strategy and action plan (SSAP), which serves as a basis for government decisions and donor collaboration. Finally, a comprehensive action plan consisting of sector advisory support, human resource development, demonstration projects, and technical research is implemented.

Although emphasis so far has been on analyzing the sector, in the future RWSG-EA will increasingly concentrate on mobilizing resources and coordinating donors' contributions in conjunction with implementing demonstration projects. Having laid the groundwork, it is now poised to encourage, in a well-thought-out and coordinated fashion, large-scale investments in the sector.

During 1988, RWSG-West Africa (RWSG-WA) presided over the preparation and launching of the Program's two largest demonstration projects in Africa. These are a rural water supply and sanitation project in Nigeria, described in the introduction, and an urban sanitation project in Kumasi City, Ghana, which will be one of the first uses of intermediate sanitation technologies in urban areas in West Africa.

RWSG-WA, together with headquarters staff, in 1988 also conducted a review of successful community-managed water supply projects in francophone West Africa. Among other activities, it organized workshops on sanitation for educational advisers, heads of schools, and health technicians in Côte d'Ivoire, as well as produced a film on sanitation and hygiene that was shown on local television. The CREPA (Centre régional pour l'eau potable et l'assainissement à faible coût) was launched in Ouagadougou, Burkina Faso, in 1988 and will set up training activities in Ouagadougou and at key institutions in other countries. CREPA also supervises the only scientifically monitored wastewater stabilization pond in the region.

Activities managed by both RWSG-EA and RWSG-WA during 1988 are described in detail in the Country Reports section of this report.

Looking to the Future

In its efforts to make the RWSGs the cornerstone of field operations through the remainder of the IDWSSD and beyond, the Program will continue to recruit staff to maintain the momentum created thus far.
By the end of 1989 the RWSG-South Asia in New Delhi will have a regional manager, a senior rural water and sanitation specialist, a community development specialist, and a water supply and sanitation specialist to be outposted as country coordinator in Pakistan. A financial analyst and a human resource development specialist will be added. The Asia RWSG will work closely with the Asia Sector Development Team managed by the Bank’s Asia Technical Department and funded under UNDP Project RAS/86/160 with collateral donor support.

The Program is in the process of establishing a RWSG-East Asia to deal mainly with China, Indonesia, Thailand, the Philippines, Burma, and other countries in the region. By the end of 1989 the first two staff will be in post.

In the Middle East, it is hoped that a waste management specialist will be posted in 1990 to form the basis of the RWSG. This will be part of a plan to strengthen a UNDP Project (RAB/88/009) already under way that is one of the few to assist governments in water, sanitation, and waste management as an integrated package. The project aims at developing a program in waste management and recycling for the Maghreb countries of North Africa. Three main activities will be the core of the work plan—a waste management project in collaboration with the World Health Organization (WHO) Regional Office and the UN Food and Agricultural Organization (FAO), the UNDP/Europe Resource Recovery Network, and a waste management project in the Maghreb, funded by the French government.

In Latin America, the RWSG will be staffed initially with a sector development adviser and a sanitary engineer.

Country Program Strategies

The work of the RWSGs will be based on the Program’s commitment to an integrated approach to sector development at the country level. This approach will consist of the following elements: sector work leading to the development of sound sector policies; demonstration projects to test and refine implementation strategies; human resource development and training; development of institutional capacity in both the public and private spheres; support to investment and development projects leading to large-scale implementation; and continual dialogue with the government and external support agencies active in the sector.

Of chief concern among these are: sector advisory support, demonstration projects, and human resource development and training. Sector advisory support will be given to those countries that undertake national demonstration programs. It will be made available to governments and public and private enterprises alike, as well as to NGOs and the manufacturing and construction industries. Through the development of
sector strategy and action plans, a task already underway in RWSG-EA, long-term development in the sector will be enhanced and the acceptance of low-cost water and sanitation approaches will be fostered.

Demonstration projects will consist of a three-stage approach, beginning with a pilot phase that leads, during the second stage, to larger-scale demonstration projects. These demonstration projects, based on their success, will be scaled up to implementation on a national level. The aim here is to lay the foundations for large-scale investment, as well as to encourage policy development by demonstrating successful low-cost approaches that can be replicated on a national scale.

Human resource development will address the needs of professionals and technicians in planning and implementing appropriate technologies. It will also combat one of the major constraints to increased investments in low-cost water and sanitation systems: the lack of interest and understanding among decision makers and engineers. More attention will also be paid to developing community training materials and programs and in preparing training workshops for those at community, national, and international levels.
Global Research and Training Activities: Meeting the World's Growing Needs

Despite the urgent need to reach more people, government and donor efforts to widen water and sanitation coverage in the developing world have turned into a struggle to meet ever-increasing demands. The need for clean water and adequate sanitation is rising, spurred by fast population growth, especially in the cities. At the same time, safe water sources are becoming more costly because of urban concentration. The resulting pollution necessitates additional treatment or piping from distant locations. Meanwhile, global and local financial resources for providing service are dwindling in the face of adverse economic conditions. The cost of achieving even slight increases in coverage over the period 1985-90 is estimated at $10 billion per year, of which the World Bank can provide barely 10 percent.

To make headway in this discouraging environment, the World Bank's Water and Sanitation Division has identified four key issues that need to be addressed.

First, ways must be found to make water resources available at acceptable costs to meet the growing demands of competing domestic, industrial, and agricultural uses. Few countries have developed the institutional capacity and mechanisms, such as regulation and pricing of water for competing uses, to manage water resources effectively. Where water laws exist, they often focus on irrigation and ignore groundwater and other surface water. Prices seldom cover the cost of providing water. Use of water for agricultural and rural drinking water purposes is generally more heavily subsidized than for urban and industrial uses, and existing prices do not provide appropriate signals for reallocating water as circumstances change. To solve the problem, available water must be efficiently reallocated among users, used water must be conserved, and new sources must be exploited. An appropriate mix must be found between the use of pricing and incentives on the one hand, and administrative measures on the other.

Second, the right incentives need to be found to improve the effectiveness of institutions generally, and the management and maintenance of facilities in particular, to make service sustainable. This means matching technologies and service levels with the communities' ability and willingness to pay and, in rural communities, selecting systems the community can maintain and repair itself. World Bank-financed projects often have been beset by intermittent service, faster-than-expected deterioration of facilities, unsold water, lower than planned revenues, and high levels of unaccounted-for water. Sector opinions on the cause of the institutional problem range from wrong organizational form to inadequately trained management to over-centralization to lack of community involvement, especially of women, to underdevelopment of the private sector. But at the heart of all of these problems is the incentive question: Does the
structure of controls inside the institution and in its surrounding environment let it function effectively? There has to be a payoff to spark management to become trained, to set tasks, and to make cost-effective investment choices. If a utility can rely on government subsidies or donor grants, there is no financial necessity forcing management to try, for instance, to reduce unaccounted-for water.

Third, environmentally safe collection and disposal of municipal waste and wastewater must be provided to reduce the already mounting costs of limited past attention to these matters. Waste management institutions are especially weak in the developing world’s cities, service levels are very low, and many countries lack national and local waste management strategies. The large amounts of domestic and industrial waste generated exceed the capacity for environmentally safe management despite the best-intentioned efforts of municipal authorities. Low priority is given to the subsector at the global, national, and municipal levels. Efforts to increase service coverage and collection rates will aggravate the disposal problem if appropriate disposal continues to be ignored, leading to higher health and treatment costs. Environmental impacts in social and economic terms must be better quantified, and research is needed to help municipalities improve waste management operations, perform strategic planning, and develop an appropriate regulatory and enforcement framework.

Fourth, the needed level of financial resources must be achieved and sectoral access to such resources made more reliable. Usually, when those in the sector talk about financial issues, the focus is on the need to raise the level of cost recovery from users of water supply and sanitation services. It is true that the Bank and the Program have found it hard to sustain advances in service without higher levels of cost recovery from users than achieved so far. But this is only part of the picture. A delicate balance must be struck in each case between making the service self-financing so that it is sustainable, and making service available to the poorest people through partial subsidy. Many questions still have to be answered about the most efficient ways for governments to raise the funds to make up the difference between what users pay and the cost of service. Those in the sector have to see the larger picture, which means looking at how financial flows to the supply institution are related to other fiscal responsibilities of local and higher level governments. It needs to analyze the effect different combinations of user charges and allocations of local and general tax revenues have on institutions, and the mechanisms through which taxes and fund transfers are organized. It also needs to study conditions under which sectoral institutions should finance more of their investments through capital markets.

UNDP-Bank Program Research

Within the framework of these issues, the UNDP-Bank Program is addressing a set of applied research priorities grouped into three areas of Program activity: rural water supply and sanitation, urban sanitation, and municipal waste management. The
Immediate goal is to link the research activities with the operational activities to address problems in the field and at the same time benefit from the field experiences. Likewise, the operational activities can adopt the results of the research.

One of the ways the Program is doing this is by preparing case studies on the implementation of projects. This gives the Program useful information for planning future demonstration projects and provides some of the data for the research program. Case studies were completed in 1988 in Lesotho, Botswana, Zimbabwe, Tanzania, the Philippines, Indonesia, and Guatemala. They are expected to be published by the end of 1989. A second series of case studies was completed in francophone West Africa in 1988 and circulated internally. Studies in India and Bangladesh will be completed in 1989. Also in 1989, studies on solid waste management are planned for West Africa, Asia, and Latin America. The Program plans to develop a number of publications drawing on these case studies: individual country studies, a volume of abstracts from the studies, and individual papers on project components such as social marketing, urban sanitation, and rural credit.

Rural Water Supply and Sanitation -- Community Management

There is a growing concern in the development community that the centralized provision of rural water and sanitation services as a public good is an ineffective approach to meeting needs. According to WHO's Review of Mid-Decade Progress (1985), only 42 percent of rural inhabitants have adequate water supplies and only 16 percent have proper sanitation facilities. As low as they are, these figures may even overstate the availability of properly functioning water and sanitation services. Many, if not most, rural systems, especially piped water supplies, operate far below capacity because of problems stemming from poor management, insufficient resources, and lack of community support. These problems appear to be particularly acute in systems implemented and controlled by central government agencies.

Where rural water systems are able to sustain adequate operation and maintenance over time, a crucial characteristic seems to be substantial community involvement in the management and operation of the facilities. Evidence of successful systems involving community management can be found in selected areas of Africa and Asia, as well as in Europe and the United States. The experience of these rural systems, particularly the institutional arrangements making users responsible for ultimate system sustainability, should provide valuable insights into the process of developing community water supply projects in other areas of the world.

The Program is completing a study of the institutional framework of small community water supply systems in the United States, with a final draft expected in May 1989. Over the past 50 years, there has been a significant growth of piped water systems to rural communities in the United States. This growth started as spontaneous improvements.
KWAHO, a nongovernmental organization in Kenya, has trained local water committees in organization, health and hygiene education, and water system maintenance. Here a group of women learn how to repair an Afridev handpump.

by commercial interests and the communities themselves, but in the past 20 years has been materially aided by the provision of government credit and, in some instances, technical assistance. The study is showing that local initiatives, the private sector, and community-based management and operations are the dominant characteristics of the United States' experience.

The Program also conducted a two-day workshop on the issue of community management of rural water and sanitation systems in December 1988 in collaboration with the Water and Sanitation for Health Project (WASH). The general conclusions were that the concept holds great potential for the promotion and implementation of sustainable rural water and sanitation programs in developing countries. Furthermore, it appears that the use of community management concepts in these programs may significantly improve the effectiveness of donor resources to expand sustainable coverage and thereby help countries meet their water and sanitation goals.

The Program is formulating a series of applied research activities on the subject of community management, several of which will be launched by mid-1989. The goal is to identify replicable institutional elements from systems in the developed world and adapt them to developing countries. The elements will be incorporated into demonstration projects and sector policy work. Actors in the institutional frameworks to be studied may include beneficiary communities, central and local governments, the private sector, nongovernmental organizations, and external support agencies. Related research will address demand generation through education and marketing; sources of finance, financial intermediaries, and the associated regulatory frameworks; policy formulation; project development management and system operations management; and human resource development and training.
The Program collaborates closely with PROWWESS (Promotion of the Role of Women in Water and Environmental Sanitation Services), a UNDP interregional project executed by UNDP in New York. The group has been particularly involved in developing participatory training and evaluation methodologies. PROWWESS has a staff member located in the West Africa Regional Water and Sanitation Group (RWSG) in Abidjan. Plans are under way to place PROWWESS staff in each RWSG and at Program headquarters in Washington. It has also provided substantial inputs into the training and software side of the Program's Kwale handpump project in Kenya and its rural sanitation project in Lesotho. The Program will prepare joint case studies with PROWWESS in 1989 on the Kwale and Lesotho experiences.

Case studies prepared by the Program in Togo, Burkina Faso, Mali, and Côte d'Ivoire in 1988 and circulated internally looked at community management of rural water supplies, particularly the role and structure of community organizations, financing, spare parts distribution, and sustainability.

Urban Sanitation -- Alternatives to Conventional Sewerage

The challenge in urban sanitation is to extend adequate services to medium- and low-income communities in the face of limited global and national resources. Constraints are the high cost of conventional sewerage, lack of methodologies for estimating effective demand, weakness of sanitation institutions, and the need for a rigorous analysis of the private and public benefits from investments in the sector. Lower-cost alternatives to conventional sewerage must be explored, institutions strengthened, demand stimulated, and the analytical basis for project choice improved to attract more investment to the sector.

Mathare Valley, a peri-urban area on the outskirts of Nairobi.
According to the United Nations, by the year 2020 half of Africa's population will have migrated from rural areas to the cities. Provision of water and sanitation services in these slum areas will be a major concern of the Program in future years.
A key institutional issue is that formal urban sanitation institutions lack incentives to find ways to reach the peri-urban poor. The question is how to mesh low-cost on-site systems affordable to the poor with utility-type institutions supplying the public service part of conventional sewerage, which traditionally has entailed little or no interaction with the consumer. Formal institutions are not necessarily capable of supporting on-site systems made up only of private service components. There is some question whether the two types of systems can or should be meshed at all. Either separate systems will have to be developed, or existing institutional mechanisms and structures will have to be modified to fit the choice of technology and to ensure that they are within the financial, technical, and managerial capacities of the target populations. A question that needs to be explored is the extent to which strategic management concepts and practices would be applicable.

Available data suggest the need for adequate sanitation is high, but that a big gap exists between need and effective demand. This is in part because of the high cost of sanitation, limited consumer access to credit, lack of an effective methodology for estimating and stimulating effective demand, lack of appreciation of the full benefits of improved sanitation, and lack of a methodology for marketing sanitation.

To address these issues, the Program has identified a number of applied research projects. Four of them are underway.

- A Handbook on Urban Sanitation will distill the experiences gained by the Program and highlight unresolved issues. The book will have two parts, the first addressed to policy makers and the second to technicians. The manuscript is due to be completed by the end of 1989.

- Second is a study of alternatives to conventional sewerage, such as shallow sewers; solids-free-sewerage, also known as small-bore sewerage; and simplified sewerage. The goal of the study is to document the design characteristics of these alternative technologies, assess the cost savings that they offer, and determine their suitability for application in other countries. The study also will provide guidelines on planning, design, construction, and operation and maintenance of these alternative sanitation facilities.

- The third project is a study of the association between the choice of sanitation technology and the income, education, and tenure of its owners. Data from housing surveys in four developing country cities were used for this study. The results are written up in draft form and will be finalized in 1989.

- The fourth project is aimed at determining the extent to which the techniques of social marketing can be used in stimulating demand for sanitation. The project will make use of case studies and lessons from other social sectors. A background paper has been completed and the first field study is about to start in India.
Projects under preparation include the following:

- A study of cost data and cost functions of sanitation systems from different regions of the world.

- A study of methodologies and determinants for urban sanitation demand. The first field study will start in Ghana in July 1989. This will be a groundbreaking effort to realize the above mentioned goal of closely linking Program operations and research, so that research responds quickly to the needs in the field. The study is, all at once, part of the Program's global research program, part of the Abidjan RWSG's regional operations, and part of Ghana's Kumasi Urban Sanitation Demonstration Project. The Program intends to replicate this approach elsewhere.

- The development and testing of a simulation model for analyzing and assessing various financial and economic trade-offs for the selection of alternative sanitation technologies in a citywide strategic planning effort.

Action on the following is slated for 1990:

- The development of a methodology for strategic sanitation planning; and

- A review of Bank experience in urban sanitation lending.

Municipal Waste Management -- Strengthening Institutions

Provision of water creates an associated cost for environmentally safe collection and disposal of wastewater. If these costs are not paid by providing appropriate treatment and disposal facilities, they will be paid later with adverse health and living conditions and increased spending to treat polluted water. Municipal wastes, consisting of domestic solid and liquid wastes, often have industrial and special wastes indiscriminately mixed in with them. Many can be considered hazardous and need special disposal facilities. Untreated sewage discharges pollute surface water resources. Leachates from solid waste dumps contaminate groundwater supplies. Uncollected garbage blocks drainage courses and provides opportunities for disease vectors to breed.

In several cities studied under a UNDP-Bank resource recovery project, on average only half of the population has benefited from solid waste collection services. Solid waste disposal is another critical problem, with open dumping the most common arrangement. Sewer systems in the cities studied reached only 12 percent of urban inhabitants in Africa and 41 percent in Latin America. Other data have shown that less than 10 percent of collected sewage receives any treatment before being discharged into the nearest water course or field.
In Lahore, Pakistan, a man sorts plastic wastes by type before selling to plastic recyclers. The sale of such wastes provides a livelihood for many in the informal recycling sector.

To overcome constraints to effective municipal solid waste management and resource recovery, the Program has identified new research priorities. These include: 1) strengthening the planning and management capacity of solid waste institutions; 2) defining affordable service levels, technology options, and delivery systems for low-income urban groups; 3) exploring ways to better use informal sector activities, for instance squatters who scavenge waste dumps, to help in waste recycling; 4) identifying options for effectively using the private sector; and 5) finding environmentally safe disposal options.

During the past year, the Program continued to carry out technical and socioeconomic research in several areas of liquid and solid waste management and recycling. It issued a contract for preparation of a landfill management manual for developing countries covering site selection and design and landfill operation, including resource recovery techniques such as materials recovery and landfill gas recovery. The final draft will be ready in December 1989. A survey of nearly 50 industrial waste exchanges was conducted to help formulate future activities in this area. Complementary to this and growing out of work in Mexico City, the Program contracted for the development of an industrial waste estimation and information system. Field testing of the system at one site in a developing country will start in August 1989. The final version of the computer software and a copy of a proprietary waste generation data base will be ready in early 1990. And the Harwell Environmental Safety Center in the United Kingdom is preparing a training module on strategic planning for municipal solid waste management. The module is expected to be incorporated into the Program’s ITN training materials by mid-1989.
Global Research and Training

The Lima wastewater aquaculture research, in collaboration with CEPIS, is proceeding with GTZ financial assistance. The first draft of an aquaculture state-of-the-art review was completed and distributed to the international experts the Program assembled in Calcutta for a major wastewater-fed aquaculture conference December 6-9, 1988. Jointly organized with ESCAP, the meeting had about 50 participants from India and the ESCAP countries. The main topics of the meeting included progress reports on the Lima research and investigation of the Calcutta wastewater fish ponds, which are the largest in the world. Publication of the proceedings is planned.

The Program initiated a new activity in 1988 on improving water supply, sanitation, and waste management in the Arab States region. The project includes both a training and a waste management component. The waste management component will be carried out jointly with operational staff in the Bank’s Europe-Middle East-North Africa Region, WHO, and FAO. An interagency field mission will go to the region in 1989 to study wastewater reuse and waste management and to identify potential project activities.

Ongoing activity on a European waste management and resource recovery network moved forward with preparation of a draft action plan during 1988, and a project document that was submitted to the UNDP European Program mid-term review meeting in Geneva.

Future directions in research include a greater emphasis on improved planning and management of solid wastes, including research into alternative management modes, financial requirements, and performance incentives. Research also will focus on the costs of providing waste management services, in particular the costs of achieving sustainable increases in coverage through various technical options that are suitable for different types of settings. To a lesser extent, research also will address the benefits of waste management services and the effectiveness of various interventions. The Program is expected to work closely with the World Bank’s Urban Development Division to prepare the division’s urban environmental issues paper. Case studies on solid waste management and resource recovery are planned. Initiation of briefs will be prepared by mid-1989 for three possible studies in West Africa, Asia, and Latin America on informal sector waste collection and recycling, with the studies to be completed by year-end.

The International Training Network for Water and Waste Management

During 1988 the International Training Network for Water and Waste Management (ITN) was strengthened with the integration of the World Bank-executed, externally funded water and sanitation projects into one Program. Of the 15 centers originally planned, eight are open, three of which are regional centers located in East Africa, francophone West Africa, and Southern Africa. Two centers are operating in both India and Indonesia and one has been established in Ghana.
ITN has produced an extensive set of audiovisual and printed materials on low-cost water supply and sanitation technologies, community participation, and hygiene education. The information and training materials incorporate the results of the applied research, testing, and field demonstration projects on low-cost technologies carried out over the past decade under the aegis of the UNDP-World Bank Program. The materials are now available in English and French. A limited number of copies of the materials in Spanish are also available. Adaptations and translations into Chinese, Bahasa Indonesia, and Portuguese are ongoing, with translations into Arabic planned. New modules are also being developed on the use of technical information, resource recovery, and human resource development. The ITN, together with the International Reference Center, is finalizing a bibliographic listing of selected materials available in English, French, and Spanish.

The ITN also carries out workshops for instructors from network centers and cooperating institutions on the teaching of low-cost, appropriate water supply and sanitation. In addition, training courses, workshops, and seminars are conducted for different levels of staff working in the sector as well as for consulting firms in industrialized and developing countries.

In 1988 the ITN worked toward the initiation of eight additional centers. In Brazil, three centers are proposed, one each in Natal, São Paulo, and Curitiba. The Brazilian Association of Sanitary Engineering will coordinate and monitor the centers and is translating and adapting the training materials into Portuguese. Reconnaissance missions have also been conducted in Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, Panama, and the Dominican Republic. The objective in Central America is to support sector institutions through improved human resource development programs using regional institutions linked with local ITN institutions. The Pan American Health Organization (PAHO) has played a major role in all seven countries in identifying training needs, making an inventory of existing training facilities, and writing proposals for establishing the ITN in the region.

A four-year proposal for network activities in the Philippines was finalized in 1988. A center hosted by the Local Water Utilities Association is expected to begin operating in 1989. The Bangladesh University of Engineering Technology has also agreed to host a center within its Civil Engineering Department.

Centers are also proposed for Nigeria, Thailand, China, and the Arab States.
Global Research and Training

ITN Centers In Operation in 1988

- The East Africa Regional Network Center (RNC), hosted by the Environmental Health Unit of the African Medical Research Foundation (AMREF) in Nairobi, Kenya, has been in operation since 1986. The RNC has held more than 30 workshops in Kenya, Tanzania, and Uganda with increasing emphasis on the training of trainers. Participants have come from national ministries of health and water, from universities and polytechnics, and from NGOs. The RNC is now decentralizing its activities, with the aim of having largely autonomous but coordinated activities in Tanzania and Uganda.

- The Centre régional pour l'eau potable et l'assainissement à faible coût (CREPA) is jointly hosted by the CIEH (Comité interafriacain d'études hydrauliques), EIER (École interétat des ingénieurs de l'équipement rural), and ETSHER (École interétat des techniciens supérieurs de l'hydraulique et de l'équipement rural), with CIEH as the lead host. The center is based in Burkina Faso and serves 12 francophone countries: Benin, Burkina Faso, Cameroon, Chad, Congo, Côte d'Ivoire, Gabon, Mali, Mauritania, Niger, Senegal, and Togo.

- The ITN was launched in India in February 1987 with the All-India Institute of Public Health and Hygiene in Calcutta and the Center for Environmental Studies of Anna University in Madras. The ITN framework for India was reviewed in 1988 and will proceed in two directions, one with a rural orientation, the other with an urban orientation.

- Two centers have been established in Indonesia— at Cipta Karya and the Institute of Technology in Bandung (ITB). Activities at Cipta Karya were started in June 1987 with funds provided by the government from the training component of the World Bank’s East Java II Water Supply Project. The ITB Network Center, supported by the government of the Netherlands, became operational in September 1987 and is hosted by the Environmental Engineering Department.

- A Regional Network Center at the Department of Civil Engineering of the University of Zimbabwe, established in 1988, will outreach to the Southern Africa Development Coordination Conference of States. Key staff have been selected and start-up activities are underway.

- A project document for a ITN Center to be established at the University of Science and Technology at Kumasi, Ghana, was signed in 1988. The center will be fully integrated in the Department of Civil Engineering. Its main activities will be in Ghana, but it may also offer services to other anglophone countries in West Africa.
The Framework for Global Cooperation:
Fostering Collaboration Among External Support Agencies

The UNDP-World Bank Program is an integral component of international efforts begun under the aegis of the International Drinking Water Supply and Sanitation Decade (IDWSSD). Conceived at the United Nations Water Conference in Mar del Plata, Argentina, in March 1977, the Decade was formally launched by the General Assembly of the United Nations in November 1980 with the goal “To provide all people with water of safe quality and adequate quantity and basic sanitary facilities by 1990.” The commitment to sustained efforts in support of the Decade has been reinforced since 1980 through six regional consultations of developing countries and three major consultations of external support agencies.

An important step toward better collaboration among external support agencies took place in The Hague from November 2 through 4, 1988, when bilateral, multilateral, and others established a Collaborative Council to “coordinate accelerated and expanded sector activities through to the year 2000.” The goal of the council is to facilitate the work of the Framework for Global Cooperation, which has the following mandate:

To maintain Decade momentum beyond 1990 and accelerate the provision of water supply and sanitation services to all, with emphasis on the unserved rural and periurban poor, by using a coordinated program approach.

The commitment to create a formal framework for international cooperation was made at the International Drinking Water Supply and Sanitation Consultation at Interlaken, Switzerland, in October 1987. The Interlaken Consultation suggested that a Collaborative Council be formed in which UN development organizations and multilateral and bilateral agencies would be strongly represented. The consultation also proposed the inclusion of NGOs and underlined, as a matter of principal, that developing countries “...must be brought into the consultative process and participate in The Council’s activities.”

A series of meetings were held throughout 1988 during which proposals for both the framework and the council were discussed. In October 1988 the Program hosted a working group meeting in Washington, D.C., in preparation of the Hague Consultation, during which a revised framework document was produced, together with a summary outlining the proposed organization of the Collaborative Council; an action plan for the council; an agenda for the Hague meeting; and a listing of progress made since the Interlaken Consultation.
The establishment of a Collaborative Council in November represented a major advance in the collaborative process. The council's chief responsibility will be to coordinate efforts of external support agencies (ESAs) at the country, regional, and global levels. Three main areas will be addressed: sector support (at the country level); communication of information; and applied research. Generally, sector support will be focused on coordinating international efforts at the country level, with the goal of substantially expanding service coverage. Through communication of information, the council will try to raise the profile of the water supply and sanitation sector at national and international levels. In the area of applied research, the Hague Consultation made it clear that there was still a need for studies and demonstration of new approaches over a wide spectrum, including both technological and socioeconomic aspects of water supply and sanitation and associated environmental issues.

The council will hold biennial meetings open to multilateral and bilateral agencies, nongovernmental organizations, international research organizations, and invited guests from developing countries. It will be supported by a secretariat formed by the existing Secretariat of the IDWSSD Steering Committee, which can call meetings of
temporary committees to help develop and monitor the council's work plans. One such interim committee, the 1990 Committee, has been established to help define a detailed work plan and to prepare activities for maintaining the momentum of the Decade. Results of the 1990 Committee meetings should be forthcoming in mid-1989.

The primary actors in water and sanitation development have been and will continue to be the developing countries themselves. Although external support is vital, success ultimately depends on the national efforts of individual countries; coordination of activities within countries will aid achievement of success. The need for closer collaboration in this area through the work of the council is being acknowledged by an increasing number of donors.

The UNDP-World Bank Program has an important role to play in assisting the new council, particularly by providing support to individual country governments through the Regional Water and Sanitation Groups. The applied research and information activities of the Program will also provide a substantial impetus to council activities. The Program is organizing a global meeting of senior government officials to be held in India in September 1990 during which major issues constraining the sector will be discussed. The meeting will hopefully pave the way for continued commitment to the sector into the 1990s.

Although the original Decade goals will not be met by 1990, the momentum gained during the International Drinking Water Supply and Sanitation Decade must be maintained in the future. As a creation of the donor community, the UNDP-World Bank Program is in an ideal situation to help governments and the donor community to extend service coverage to those most in need.

Following is a summary of joint activities of the UNDP-World Bank Program and its bilateral donors.
Program Financing

During its ten years of existence, the UNDP-World Bank Water and Sanitation Program has enjoyed stable core support from UNDP that has enabled it to attract millions of dollars in additional financing from more than ten donors. UNDP's core support has come from both the Division for Global and Interregional Projects and from five Regional Bureau Programme Divisions. In-country activities have been financed by UNDP country funds in 15 countries. In total, 43 separate UNDP water and sanitation projects have been financed. A list of the active projects in 1988 appears at the end of this section.

The following donor countries have contributed funds directly to the Program: Canada, Denmark, Federal Republic of Germany, Finland, France, Italy, the Netherlands, Norway, Switzerland, and the United Kingdom. Others, notably Sweden, have provided cash support through other means. All bilateral donors have provided millions of dollars in indirect support to the Program.

The Program has been active in more than 40 developing countries during the past decade, and some of these countries have made contributions to support the Program's work. These contributions have taken two primary forms: first, as counterpart contributions, in the form of staff, office space, and equipment; and second, and far more important, as investment in projects that have grown out of the Program's work. Although neither of these two kinds of contributions can be easily quantified, direct cash support can. Two developing countries--Tanzania and Malawi--used IDA funds to support Program activities, and three others--Brazil, India and Nigeria--invested their own capital in cost-sharing arrangements with UNDP to pay for Program activities.

The table on page 29 summarizes contributions of UNDP and external donors to date. UNDP has contributed US$50 million to the program; US$1.7 million has come from other sources, including cost-sharing contributions from developing countries mentioned above; and the donor community has financed the balance of approximately US$22.2 million. From all contributions to date, the Program has disbursed US$45.3 million through December 1988 leaving a balance available of US$28.7 million to finance program activities from 1989-92.

New Projects in 1988

During 1988 five new UNDP-financed activities were approved. These include three country-level projects in West Africa: in Ghana the Low-Cost Human Wastes Management Pilot Project for Kumasi (GHA/87/016, US$644,100); the Nigeria Rural Water Supply and Sanitation Project (NIR/87/011, US$4,145,278) that will cover four states and the federal capital territory; and preparation of a Strategic Sanitation Plan for Dakar, Senegal (SEN/87/026, US$380,000). In China, through an associated agency agreement with UNDP Project CPR/88/011 executed by the government, the Program
## Table 1: Funding by Donors for Projects Executed by the Water and Sanitation Division in US Dollars

<table>
<thead>
<tr>
<th>UNDP Water and Sanitation Projects:</th>
<th>Contributions 2</th>
<th>Disbursements 3</th>
<th>Available Future Years 4 (1989-92)</th>
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<td><strong>Global</strong></td>
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<td><strong>Denmark</strong></td>
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<tr>
<td><strong>The Netherlands</strong></td>
<td>3,375,000</td>
<td>0</td>
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<td><strong>Norway</strong></td>
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<td>5,101,306</td>
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<td><strong>Switzerland</strong></td>
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<td><strong>United Kingdom</strong></td>
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<td>430,749</td>
<td>53,811</td>
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<td><strong>Bilateral donor subtotal</strong></td>
<td>22,250,297</td>
<td>11,586,953</td>
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<td><strong>Other: 5</strong></td>
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<td>1,309,934</td>
<td>447,080</td>
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<td><strong>Grand Total:</strong></td>
<td>74,016,569 6</td>
<td>45,308,663 6</td>
<td>28,707,906</td>
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</table>

1/ Variations in total contributions are due to currency exchange rates applied.
2/ Excludes projects executed by the Urban Division approximately US$2.0 million.
3/ Includes overheads charged by management.
4/ Net.
5/ Includes cost sharing contributions by countries of India, Brazil, Tanzania, Malawi and Nigeria.
6/ Figure derived from unaudited, unofficial project files.
has assumed responsibility for implementing a US$260,000 component. A new regional project combining waste management and resource recovery with human resource development (RAB/88/009, US$475,000) was approved by the Arab States Bureau.

Four new donor-financed activities were approved in 1988. The Norwegian government, through the Ministry for Development Cooperation and the World Bank, signed a trust fund for US$4.5 million that it will use to support a variety of Program activities throughout the world into 1992. In November 1988 the Dutch government signed a cost-sharing agreement with UNDP to provide approximately US$2.6 million to support community water supply and sanitation in Indonesia. The Federal Republic of Germany, through the Ministry of Economic Cooperation (BMZ), approved a contribution of approximately US$300,000 for low-cost sanitation activities, mainly in West Africa. And in Nigeria, the Dutch government approved a cost-sharing contribution of US$775,000 to the Nigeria Water and Sanitation Demonstration Project (NIR/87/011).

**CANADA**

Contribution: US$3.1 million

The Canadian International Development Agency (CIDA) has played an important role in supporting projects in the water and sanitation sector. Since 1982, CIDA has made substantial contributions to activities of the UNDP-World Bank Water and Sanitation Program:

- CIDA has been active in handpump demonstration and testing in Sri Lanka, Côte d’Ivoire, and Ghana. In the first half of the Water Decade, CIDA supported a field trial to test the village-level operation and maintenance concept in Sri Lanka, Côte d’Ivoire, and Ghana. At present, CIDA support is being used in Bolgatanga, Ghana, where the Program is demonstrating a community-managed system of handpump-equipped water points.

- A draft Master Plan for Solid Waste Management has been prepared for Côte d’Ivoire, in which eight components for investment were identified, including extending services to low-income areas and investigating resource recovery options for municipal and solid wastes.

- CIDA financing was instrumental in the development and production of the information and training materials on rural water supply and low-cost sanitation (training modules and films) and its subsequent mass production.

- During 1988, CIDA funded the proposal that led to the establishment of an ITN Center at the University of Kumasi in Ghana that will serve anglophone West Africa. In addition, CIDA is supporting a Regional Network Center for Francophone Africa to serve 13 countries in West Africa through training, research, and information dissemination of low-cost technologies.

- The Mirzapur Field Study in Bangladesh has been conducted with funding from CIDA and help from the International Center for Diarrhoeal Disease Research (ICDDR,B).
The field study quantified health benefits of environmental sanitation interventions, including improved water supplies, hygiene education, and excreta disposal in sanitary latrines.

- The Program is also working closely with CIDA and the World Bank in planning a major rural water supply and sanitation program in Pakistan, and has proposed a demonstration project as part of a CIDA-supported rural water and sanitation project in Ethiopia.

Of a total contribution to date of approximately US$3.1 million, a balance of half a million dollars remained as of January 1989. It is earmarked for the community water supply demonstration project in Bolgatanga and for completion of work in Bangladesh.

**DENMARK**

Contribution US$250,000

Through the Danish International Development Agency (DANIDA), the government of Denmark has financed a regional staff position in the East Africa Water and Sanitation Group. This post, for a sector planning engineer and his associated operational costs, was financed through a cost-sharing agreement with UNDP spanning two years and totaling US$250,000. The engineer took up his post in the Nairobi RWSG in April 1988.

In addition, DANIDA has provided (indirectly rather than through cost sharing) an associate engineer to assist with the development and production of the Tara pump in Bangladesh, with the Mirzapur field study, and later with other water supply activities in South Asia. (A third position at Bank headquarters in the South Asia Urban and Water Supply Division was not directly part of the Program.)

The balance from this cost-sharing agreement is about US$150,000 as of January 1989.

**FEDERAL REPUBLIC OF GERMANY**

Cash Contribution: US$2.5 million

The German Ministry for Economic Cooperation (BMZ), through the Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ), is one of the most active donors in the UNDP-World Bank Program, providing support to handpump development and testing, research on integrated resource recovery, implementation of low-cost sanitation projects, and human resource development. Since 1983, GTZ has contributed US$2.5 million to the following projects:

- In China, the Chinese Academy of Agricultural Mechanization Sciences (CAAMS), GTZ, and the Program collaborated on laboratory and field testing of drinking water handpumps and animal or human-powered irrigation pumps. In 1986 the work was extended into another phase, through 1988, of testing and demonstration of selected Chinese and foreign-made handpumps appropriate for rural and urban-fringe areas in Xinjiang and Inner Mongolia Autonomous regions.
GTZ has helped with the production and translation (French, Spanish, and Chinese) of the information and training materials on low-cost water supply and sanitation. GTZ has also supported the Program's extension of the International Training Network for Water and Waste Management to Central America, Indonesia, and China and has provided a direct grant to start up the ITN Center at AMREF in Kenya.

Research on integrated resource recovery (waste management and recycling) was undertaken in China, Nepal, Thailand and Peru with GTZ support. In China, the Shanghai Resource Recovery and Utilization Company (SRRUC) was studied in detail and a technical and economic/financial analysis prepared. The results were presented in an International Resource Recovery and Utilization Seminar held in Shanghai in November 1984. In Nepal, a case study was written on glass recovery and reprocessing in the Kathmandu Valley. The UNDP-World Bank Decade Program has also provided technical support to a pilot project directly funded by GTZ on landfill gas recovery and utilization in Sierra Leone.

GTZ has supported a series of research and dissemination activities on sewage-fed aquaculture, including the San Juan Aquaculture Demonstration Project in Lima, Peru, an Expert Meeting on Aquaculture in Lima in March 1985, the preparation of a scientific review of sewage-fed aquaculture, and the International Seminar on Wastewater Reclamation and Reuse for Aquaculture in Calcutta, India, in December 1988. The direct support to the Program for this activity was coupled with US$270,000 contributed directly to the Peruvian authorities for the aquaculture demonstration project.

GTZ has also been active in support of the Program's low-cost sanitation activities in Africa: in Tanzania and Benin, where the Program technically backstopped GTZ-financed sanitation advisers; in Zimbabwe, where the Program supported a GTZ-financed project; and in Ghana and Cameroon, where efforts have been directed at laying the groundwork for introduction of low-cost sanitation technologies on a large scale.

In early 1988 GTZ placed a sanitary engineer in the West Africa RWSG and provided DM560,000 for his support and other sanitation activities in the region. The GTZ-financed program officer has focused his efforts on programs in Benin, Congo, Guinea, and Zaire, with a view to creating a balanced program of activities in rural water and sanitation, waste management and resource recovery, and advisory support.

The present status of GTZ-financed activities is as follows: from the total contribution of approximately US$2.5 million, all funds have been exhausted, except for US$132,000 which will be utilized by the Resource Recovery Program in 1989 and US$170,000 that is available for the GTZ-funded expert in Abidjan and associated low-cost sanitation work.

FINLAND

Contribution: US$633,551

The government of Finland, through the Finnish International Development Agency (FINNIDA), has provided US$633,551 in support of Program activities, including:

- In 1982, FINNIDA funding (US$296,000) was used to start up and finance activities of the project preparation units in Nairobi and Abidjan until UNDP funds became available the following year. These units were the predecessors of the Regional Water and Sanitation Groups now operating in East and West Africa.
International Donor Coordination

- A US$20,000 contribution helped finance production of three films during 1983-84 which were part of information and training materials on low-cost water supply and sanitation.

- FINNIDA funds totaling US$51,000 supported the work of a handpump engineer (UN volunteer) in Nairobi for two years (1984-86), including local travel and a vehicle.

- FINNIDA is supporting, through a US$250,000 cost-sharing contribution with UNDP, a sector planning engineer in the Nairobi RWSG for two years. The engineer took up his post in the RWSG in September 1988.

The FINNIDA contribution to the UNDP-World Bank Program components managed by INUWS totals US$633,551, of which $206,000 remained as of January 1989. Another US$250,000 (through the same cost-sharing agreement as the Finnida engineer in the East Africa RWSG) is financing an engineer stationed in Bangkok. This post is part of the East Asia Sector Development Team managed by the World Bank's Asia Technical Department. Inclusion of this US$250,000 contribution brings the total Finnish contribution to US$883,551.

FRANCE

Cash Contribution: US$957,000

In January 1987 the French Ministry of Development Cooperation signed an agreement with UNDP that provided a total of FF8.0 million (about US$1.3 million) to support Program activities. Of this total, US$957,000 was cost sharing with UNDP; an additional amount, approximately US$365,000, was retained to fund certain components through CEFIGRE. This contribution has allowed the Program to undertake the following activities:

- French funding supported three staff positions (two of them through CEFIGRE and one through UNDP) for sector development in Sub-Saharan Africa. These positions (two in the Abidjan RWSG and one in the Nairobi RWSG) added professional and language skills that greatly expanded the Program's capacity to work in francophone countries.

- The contribution enabled the program to proceed with the translation into French and the printing of information and training materials in low-cost water supply and sanitation. Moreover, French funds were used to translate into French and print Community Water Supply:

  The Handpumps Option. This translation will enable francophone countries to use the book's guidance for rural water supply projects.

  A prefeasibility study and follow-up technical report on waste management and resource recovery systems in Dakar were made possible by the support of the French government. Unfortunately, there has not been any further progress in developing follow-up feasibility or pilot operations for waste management and resource recovery in Dakar. However, technical assistance has been provided to identify a number of short-term, low-cost measures to improve solid waste management in Dakar, along with medium-term measures that require more investigation and analysis.

All the work financed by the French contribution has now been completed and funds exhausted, except for US$53,000, which is committed for resource recovery activities in 1989. The French government has extended the contracts, through CEFIGRE, of one staff member in both the East and West Africa RWSGs for an additional 15 months.
ITALY

Cash Contribution: US$300,000

The Italian government, through the Department for Development Cooperation (DDC), was an early supporter of the integrated resource recovery project. DDC's support enabled the Program to complete a study of formal and informal waste management and resource recovery within the Mexico City metropolitan area during 1987-88. The study made proposals for follow-up demonstration activities, including establishment of a full-scale industrial reuse zone and construction of a wastewater treatment plant and distribution system. Negotiations are under way between the governments of Italy and Mexico to secure grant funding, to be channeled through UNDP, for this demonstration activity.

The study also resulted in development of a methodology for predicting industrial waste generation in urban areas. Because of the general applicability of the method to other cities, it was decided to develop a microcomputer software system that would include the industrial waste prediction model as well as a database of waste generation coefficients by industrial type. DDC is also financing this effort via a special cofinancing contribution to the Italian consultant trust fund maintained by the Bank.

NETHERLANDS

Cash Contribution: US$3,375,000

In November 1988 the Dutch government signed a cost-sharing agreement with UNDP to provide approximately US$2.6 million to support community water supply and sanitation activities in Indonesia. These funds will make up a major part of the financing for a UNDP project (INS88005) in preparation and expected to be approved by mid 1989. In 1988 the government of the Netherlands also made a cash contribution of US$775,000 to the Program to support the rural water supply and sanitation demonstration project in Nigeria for three years (through 1991). This project is also financed by UNDP (NIR87/011) and the Nigerian federal and state governments. The Dutch funds will be provided for consultants for geophysical work, for the appointment of an expert on women in development to work on the project, and for resources to strengthen personnel for institutional development for training and for water resource development.

In addition, the Dutch government, through direct support to the International Reference Centre (IRC) in The Hague, is helping the Program develop and disseminate information and training materials for low-cost water supply and sanitation.

The government of the Netherlands as of the end of 1988 was considering financing a large demonstration project in Bolivia for US$38 million. The proposed project would concentrate on the provision of water supply and sanitation services to the dispersed rural population of the Altiplano region of the country as a demonstration of the feasibility of widespread low-cost service to Bolivia's rural poor.
NORWAY

Cash Contribution: US$7.3 million

The government of Norway, through the Ministry of Development Cooperation (MDC), has made the largest contribution (US$7,277,000) to the Decade Program through cost-sharing agreements with UNDP and through trust agreements with the World Bank. There are six agreements to date. Four of them are cost-sharing agreements through UNDP totalling US$2,581,000. Two are trust fund agreements: one is for US$196,000 and the most recent, for US$4,500,000 (the largest single contribution to the Program from any source), was signed with the Bank on December 18, 1988.

Since 1984, MDC has supported the following activities:

- In Zimbabwe, beginning in 1984, a Rural Water Supply and Sanitation Adviser has been posted in the Public Health Inspectorate of the Ministry of Health. The adviser has helped execute the National Master Plan for water supply and sanitation in the communal lands and resettlement areas. Approximately 3,500 water points and 40,000 latrines have been developed with the help of the project.

- In Kenya, a country of special interest to MDC, there have been three projects. From 1984 through 1987, MDC supported the activities of a Sanitation Adviser in the Ministry of Water Development. Also in the same ministry, funds were made available for a specialist and for research activities in the Research Division. From mid-1986 through mid-1988, a Sanitation Sociological Adviser was placed in the Public Health Inspectorate of the Ministry of Health. She planned and ran workshops for trainers involved in water and sanitation activities and developed a Sanitation Field Manual that was published recently.

- Since mid-1988, MDC has funded two positions in the Nairobi RWSG: a community development and training specialist (the Sanitation Sociological Adviser from the Kenyan Ministry of Health) and a Senior Planning Engineer (seconded from WHO). Both of these staff have been fully integrated into the work program of the RWSG and are actively involved in various countries in the region.

- MDC has financed two positions at program headquarters in Washington: the first, beginning in late 1987, is a Program Officer to help with program support and development, particularly in Indonesia; the second, beginning in early 1988, is a Senior Program Officer, who provides headquarters support to the Nairobi RWSG and its work in the Eastern and Southern regions of Africa.

As of January 1989, about US$565,000 remains from the cost-sharing agreements that have been committed but not disbursed as of December 1988. During 1989 these funds will be used to support the activities for which they were designated until they are exhausted.

The new MDC contribution of US$4.5 million will be used to support water and sanitation program activities from 1989 through 1992 in the following key areas:

- design, implementation and evaluation of community water supply and sanitation demonstration projects in three countries:

1 The trust fund supports a global research project to improve the effectiveness of investment in the water sector. It is being undertaken by the Bank's Urban Development Division and is not formally a part of the UNDP-World Bank Water and Sanitation Program.
tentatively, Zambia, Pakistan and Guatemala;

- financing of the two staff in the East Africa RWSG through 1991 and support of another regional position, probably in Latin America;

- together with UNDP, cofinancing of an ITN Center at the University of Zimbabwe;

- extension of the project in the Ministry of Health in Zimbabwe into 1991; and another country-level project to be identified;

- continuation of the headquarters' posts and additional consultancy services.

**SWEDEN**

Contribution (through UNDP’s Office for Project Services): US$300,000

The Swedish International Development Authority (SIDA) has provided funds to the Program through UNDP/OPS and has been particularly active in work in Kenya.

With funding from SIDA (through UNDP/OPS), the South Coast Handpumps Project was initiated in the Kwale District of southeastern Kenya in 1983. The project formed part of the interregional handpump testing and development project, and sought to test a number of different types of handpumps and to promote village-level operation and maintenance. Following a sociocultural study recommending promotion of more active participation, a local non-governmental organization, the Kenya Water for Health Organization (KWAHO), was brought in to train communities in organization, management of maintenance, and health education. This activity was funded by UNIFEM, with PROWWESS support.

In 1986 the South Coast Handpumps Project was expanded into the new district-wide Kwale District Water Supply and Sanitation Project, supported bilaterally by SIDA. Communities are taking over ownership and responsibility for service in an important demonstration of community management.

Since 1986 SIDA has also supported a UNDP associate expert position with the Nairobi RWSG, to assist the Kwale Project and with rural water supply and sanitation issues in general.

**SWITZERLAND**

Contribution: US$3.4 million

Formal cooperation between the Swiss Development Cooperation (SDC) and the Program began in 1984 with the signing of an agreement through which SDC made a US$1.2 million contribution to the Program. In 1987 a second agreement was signed that has increased the contribution to approximately US$3.4 million to date, making the Swiss government the second largest contributor to the Program. SDC funds have supported:
International Donor Coordination

- Prefeasibility and feasibility studies on resource recovery and waste recycling options in Douala, Cameroon, and Colombo, Sri Lanka, were completed. Demonstration proposals are being discussed with the governments, including community-based refuse collection in low-income areas, co-composting of latrine sludge with domestic waste, or recycling brewer's grains as animal feed or compost. Help was given in identifying new landfill sites. Operational support is being provided to identify and prepare a solid waste management component in a World Bank urban project.

- In community water supply, SDC has funded the work of the Swiss Center for Appropriate Technology (SKAT) in the design and manufacture of plastic components for the Afridev handpump in East Africa, as well as providing engineering support for handpump production in Bolivia, India, Pakistan, and Bangladesh. Funds were also provided for the All-Africa Low-Cost Community Water Supply and Sanitation Meeting in Abidjan in October 1986. This meeting produced the "Abidjan Statement," which has influenced the rural water supply policies of many governments. A Regional Project Officer funded in large part by SDC had major responsibility for the Program's community water supply activities in West Africa during the period 1984-88.

- In low-cost sanitation, the bulk of the Swiss contribution has been directed toward francophone West Africa, specifically for a sanitation specialist in the Abidjan RWSG. He is concentrating on developing on-site sanitation and solid waste management programs in Cameroon, Mali, Senegal, and Zaire.

- To support the Program's human resource development efforts, SDC has provided funding for one post at headquarters to help implement the International Training Network. In addition, SDC directly supports the Regional Network Center for East Africa based at AMREF in Kenya and the Regional Network Center for Francophone West Africa (CREPA) jointly hosted by three regional training and research institutions in West Africa.

As of December 1988, about 80 percent of the Swiss contribution had been disbursed. During 1989, the remainder will be used to help the program fund the sanitation specialist in West Africa, and the regional program officer supporting training activities in East and West Africa in conjunction with the Regional Office in Abidjan. Approximately US$300,000 will also be spent on proposed resource recovery demonstration activities in Colombo, Sri Lanka, on low-lying land reclamation with solid waste and composting of solid waste; and in Douala, Cameroon, on composting and community-based waste management as a follow-up on Swiss-funded city studies.

UNITED KINGDOM

Contribution: US$485,000

Through the Overseas Development Administration (ODA), the United Kingdom has supported the UNDP-Bank Program through two trust fund agreements with the Bank totalling $484,660. In addition, it has made available substantial amounts of money for core Program activities through parallel financing arrangements. ODA has provided funds directly for the following:

- ODA financed a sanitation training adviser in Kenya's Ministry of Health during the period 1984-88. The adviser has conducted a series of workshops on low-cost water supply and
sanitation and was instrumental in the writing and publication of a *Sanitation Field Manual for Kenya*.

- ODA provided almost £160,000 for the production of information and training materials on low-cost water supply and sanitation. These funds were directed to finalization of the entire set of materials in English, including artwork, graphics, and typesetting.

In addition to these direct cash contributions to the Program, ODA has funded the following activities:

- Start-up funds for establishing International Network Training Centers in India on low-cost water supply and sanitation, at the All-India Institute of Public Health and Hygiene (AIIPHH) in Calcutta and at the Center for Environmental Studies (CES) of Anna University in Madras.

- Research on handpump design, financed jointly with the Program, at the Consumer Research Laboratory in Harpenden, England, the results of which have been published in *Community Water Supply: The Handpumps Option*.

- With ODA assistance, distinct strategies for a national rural sanitation program were tested in three districts in Lesotho and funding was secured for a total of five districts.
TECHNICAL ASSISTANCE PROJECTS FUNDED BY
THE UNDP-WORLD BANK PROGRAM
1988

Global and Interregional Projects

GLO/80/004  Research and Development in Integrated Resource Recovery
GLO/84/007  Research and Development in Integrated Resource Recovery--Waste Recycling
INT/87/035  Integrated Resource Recovery
INT/81/026  Laboratory and Field Testing and Technological Development of Rural Water Supply Handpumps
INT/87/013  Water Supply for Low-Income Communities
INT/81/047  Development and Implementation of Low-Cost Sanitation Investment Projects
INT/87/014  Sanitation for Low-Income Communities
INT/86/027  International Training Network for Water and Waste Management
INT/88/711  Information and Training Program in Low-Cost Water Supply and Sanitation: Inventory of Training Materials (executed by UNDP)

Regional Projects

RAF/86/038  Water Supply and Sanitation Sector Development Teams (SDTs) for Sub-Saharan Africa (Phase II)
RAF/87/049  Water Supply for Low-Income Communities in Africa
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

39
Country Projects

BDG/85/004  Low-Cost Sanitation Programme for 51 Pourashavas (Bangladesh)
BOT/79/003  Public Health Engineer (Botswana)
CPR/88/011  Low-Cost Rural Water Supply and Sanitation (China, executed by government)
ETH/85/019  Investment Planning and Management for the Water Supply and Sewerage Authority (Ethiopia)
GHA/87/016  Low-Cost Human Wastes Management - Pilot Project for Kumasi (Ghana)
INS/84/005  Urban Sanitation Investment Support (Indonesia)
LES/86/011  Assistance to Pilot Rural Sanitation Programme (Lesotho)
SEN/87/026  Sanitation Plans for Dakar (Senegal)
NIR/87/011  Rural Water Supply and Sanitation (Nigeria)
THA/7/002  Development of Standard Handpump and Community Maintenance System for Rural Water Supply (Thailand)
UGA/84/008  Sector Development and Investment Planning (Uganda)
URT/84/004  Technical Support to the National Action Committee (NAC) for the Water Decade (Tanzania)
In West Africa, the Program's commitment to extending service coverage was demonstrated in 1988 by the formation and strengthening of a Regional Water and Sanitation Group in Abidjan, Côte d'Ivoire. RWSG-WA has participated in a variety of activities, including the preparation of a review of successful community-managed water supply projects in francophone West Africa and the launching of a Training Network Center in Ouagadougou, Burkina Faso. The group is in a building stage and greater emphasis in the future will be placed on developing an overall strategy for Program activities.

Nigeria, with a population of more than 100 million, remains a country of concentration for the Program. In 1988, more than US$5.5 million was committed for the development of a rural water supply and sanitation demonstration project in five states in that country. Other activities in the region during 1988 included the launching of the Bolgatanga Community Water Supply Demonstration Project in Ghana and creation of a project in Kumasi City, Ghana, involving the use of intermediate sanitation technologies.

**Benin**

Although the economy of Benin has been deteriorating for quite some time, the water supply and sanitation sector is among the most successful in the country. Thirty-eight urban centers are served with piped water supplies, but the operation and maintenance costs are prohibitive, and low-cost options are now being recognized as an alternative solution to increasing coverage. Although there is no national water supply plan, feasibility studies are either completed or underway for about 50 secondary centers as well as for Cotonou and Porto Novo.

Benin has been receiving Program
support since 1984 in the planning of UNDP low-cost sanitation project BEN/89/003. The project, with activities centered in Cotonou and Borgou provinces, was initiated at the beginning of 1988 and input from the Program has been extensive since then.

During 1988 RWSG-WA staff carried out a socioeconomic review in selected districts where the first latrines will be constructed under the low-cost sanitation project. These will be located mainly in public buildings (hospitals and schools), but some will also be built in private dwellings. In addition, RWSG-WA staff trained masons in latrine construction and assisted in the training of health workers who will educate the population. Staff activities included preparing drawings for construction of multiple-pit public latrines, training and equipping a local workshop for digging pits and producing prefabricated concrete beams and slabs for the latrines, and preparing project training materials.

In general, progress has been slow. There has been no technical support based in the country, so RWSG-WA staff must provide support through frequent visits. A GTZ technical assistance expert should be posted to Benin in 1989 to provide extensive support to the project and to speed up its implementation.

Burkina Faso

Burkina Faso, a flat, land-locked country in the Sahel, has only two perennial rivers within its borders, the Volta Noire and the Comoe. Groundwater resources are therefore of paramount importance in the provision of water supplies. Community participation has been promoted in rural water supply and sanitation projects since the late 1970s, and the need for low-cost approaches fits well into the overall government development policy.

Burkina Faso has benefited from a large amount of donor support, especially for rural water supply, and was one of the sites for the Program's handpump testing program in the early 1980s. After its initial involvement in Burkina Faso, the UNDP-World Bank Program became active again in 1986-87 when the then sector development team helped the government prepare on-site sanitation standards and regulations. These regulations were completed during 1988.

During 1988 RWSG-WA agreed to assist the government in formulating a strategic sanitation plan for Ouagadougou, and initial discussions were held to this end. In 1989 RWSG-WA will draft terms of reference for the preparation of this plan and help the government supervise the consultants who will develop it. RWSG-WA will also begin discussions for the preparation of a low-cost sanitation pilot project.

The francophone Africa regional Training Network Center (CREPA) is based in Burkina Faso. It became fully operational in 1988. As part of its support to activities within the country, it has constructed demonstration latrines in the capital. It is also in the process of conducting applied research activities, together with local institutions, on stabilization ponds and the reuse of effluent in irrigation.

Cameroon

With the exception of the urban water utility and the agency for rural water, sector institutions in Cameroon are underdeveloped. Responsibility is shared by a number of institutions, and bureaucratic administrative procedures pose a major constraint. A recent reorganizational effort by the government has clarified responsibilities for some of these agencies.

Program involvement in Cameroon began in 1986 with a draft proposal for a Sanitation Development Program (SDP) comprising six interrelated projects. These projects focus on low-cost sanitation technology and development of sector institutions to improve their handling of investment, planning, and programming in urban sanitation. They are linked to other
Counity Reports: West Africa

watersupply, urban development, sanitation, and health projects financed by the World Bank and the Federal Republic of Germany (GTZ and KfW), as well as nationally financed urban development programs.

A solid waste management study carried out in Douala in 1988 with Swiss (SDC) support identified landfill sites and possible resource recovery demonstration projects, and a proposal for a follow-up project was prepared. The Douala resource recovery demonstration project would comprise a pilot project for nonconventional garbage collection in poor areas and a pilot project for co-composting of urban organic wastes with brewer's grains, septage, and other compostable materials.

In 1988 the government approved the SDP and the Resource Recovery Study, and requested assistance in identifying and obtaining funds for the various projects. The government, in consultation with KfW, which is financing the Sanitation Study Project for 22 Towns (DM2.0 million), has revised the project's terms of reference. The tender documents are now ready to be submitted to five preselected German consulting firms.

The World Bank's Second Urban Development Project, originally for Douala, was revised in 1988 to include Yaounde and other towns. This project also includes a sanitation component for low-cost sanitation in Douala resettlement areas and for the study of solid waste management improvement for the city. In addition, a Rural Sanitation Study Tour and Workshop, financed through the GTZ-assisted Primary Health Care (PHC) Program and hosted by the Ministry of Health-Zimbabwe, was organized for PHC Program counterpart staff.

As a result of interest expressed by the government, future Program assistance could include the development of sector institutional capabilities in dealing not only with urban but with rural sanitation programming, planning, investment, and management. In addition, the Program could help the government prepare an urban and rural sanitation project; a resource recovery and community solid waste management project; and, together with one of the Bank's Africa Departments (AFIIN), a sector review, strategy, and action plan for rural water supply.

Cape Verde

As a result of previous discussions with the government of Cape Verde, RWSG-WA drafted terms of reference during 1988 for the sanitation part of the water supply and sanitation study for 14 secondary centers. This activity will include excreta disposal, sullage, drainage, and solid waste disposal. The study, financed by AFDB, will focus on low-cost technologies, community participation, health education, involvement of local small contractors, and use of local materials. In addition, RWSG-WA has helped to introduce the PROWESS approach into government activities in poor peri-urban areas.

Congo

Congo is a country in which the Program has had very little input. Sanitation coverage in both urban and rural areas is low. Water supply services—both rural and urban—fare better than sanitation. The RWSG conducted a mission to Congo early in 1988 to discuss preparations for a Decade consultative meeting. At this time it was agreed that further action would be taken when the government had defined a national strategy for water supply and sanitation. The Ministry of Planning set up a task force to look into this issue, and initial reports were awaited as of the end of 1988.

Côte d'Ivoire

Despite an economic crisis linked to the fall of world commodity prices, water supply service levels in Côte d'Ivoire are among the highest in West Africa. Handpumps were adopted as a means to serve rural areas even
before the onset of Decade activities. Over 14,000 rural wells have been equipped with handpumps, and the government has set a goal to increase this figure to 15,000 by 1990. The government is also committed to solving the problems of pump maintenance. A rehabilitation project for existing water supply systems, which would entail organizing a new system of maintenance, is in the process of being financed by the World Bank.

Both urban and rural sanitation coverage rates are much lower than those for water supply. To remedy this, the government declared 1988 the “Year of Sanitation” and has accepted the use of low-cost approaches, which are being promoted through a national health education program.

The Program first became active in Côte d’Ivoire in 1985 when it helped the government develop, prepare, and implement (with KfW) a low-cost sanitation (LCS) pilot project and developed a LCS pilot component for the KfW-assisted 5th water supply project. Other Program activities involved preparing project documents for CIDA-, UNICEF-, and UNDP-proposed LCS projects, and assistance in developing an urban sanitation program.

In 1988 the RWSG continued support to the central municipality of Abidjan in promoting awareness in primary schools on issues of sanitation, hygiene, and health. It organized two workshops (each lasting three days) for community trainers of 10 Abidjan municipalities; organized six one-day information sessions with school headmasters in Abidjan (522 administrators participated out of a total of 730); and produced training materials for educating primary school pupils and for people living in urban areas. A film prepared for this purpose was shown in May 1988 on Ivorian television.

RWSG-WA also worked on a proposal during 1988 for the introduction of sanitation components in an agricultural development project in the central region, which is financed by the Sixth FED (European Development Fund). The CIDA-supported Master Plan Study on Solid Waste Management and Resource Recovery for Abidjan was executed in 1988 and associated training activities carried out. Assistance with sector activities through a study of municipal waste management services in Bouafle and other secondary towns is continuing.

During 1988 Program support was also given to the government in the rehabilitation of the handpump program in Divo. Work on a project document for implementation of a joint demonstration project within the Divo area has been initiated. The project would focus on user management and maintenance of the water points.

RWSG-WA continued to assist Direction de l’Eau and ENSTP (Ecole nationale supérieure des travaux publics) with a specific program of training activities (in addition to planned support of CREPA to the country). This support comprises provision of technical assistance, training materials, and funding for various workshops. After a training of trainers workshop was held in June 1988, a second trainers workshop was held in November. Another television presentation, in which ITN training materials were used, was made in August as part of the national program of promoting sanitation. Subsequently, four radio broadcasts and a workshop for village sanitation workers were held.

In 1989, government agency workshops for technicians and engineers will be conducted with RWSG-WA assistance. Support will continue for the construction of latrines adapted for schools. The Program will complete a case study of the Eau Toujours rural water supply project. It will also continue helping implement LCS and solid waste disposal in Abidjan. The Program will help the government put in motion a project demonstrating community management of rural water supply, as well as implement handpump manufacture in the country. Another proposal is that a one-day seminar be held for donors working within Côte d’Ivoire to share lessons that have been learned in promoting improved sanitation in the country.
Gambia

In early May 1988, RWSG staff visited Gambia to determine what assistance, if any, the government needs to improve urban low-cost sanitation. A preliminary review of the urban sanitation situation was carried out, together with a Bank mission (AF51N). Further action will be considered if follow-up is requested by the government.

Ghana

The Ghana Water and Sewerage Corporation (GWSC) has achieved 70 percent water supply coverage in urban areas. GWSC is seeking US$125 million for rehabilitation and expansion of those facilities. Rural water supply coverage is about 40 percent, largely due to handpump-based projects financed by Canada and Germany.

Innovative Strategies for Ghana:
Intermediate Sanitation Technologies for Kumasi

A project for Kumasi City approved in 1988, to be executed by the UNDP-World Bank Program, will develop and promote the principle of strategic planning and management of sanitation service. This allows the designer to consider both conventional and lower-cost alternative sewer systems and on-site sanitation technologies.

The project will be a pioneer demonstration of the use of intermediate sanitation technologies in West Africa. Countries have been reluctant to use lower-cost technologies because of skepticism about their feasibility and the difficulty of allocating them to different segments of the community. The project will use a willingness to pay approach (contingent evaluation method) to assess the demand for different levels of sanitation technology. If successful, it will be a model for sewerage and sanitation throughout West Africa.

The three-year project will include: a workshop to prepare the detailed workplan; a feasibility report with an overview of sanitation in Kumasi; a pilot project based on technology acceptable to the community and City Council; a program to provide sanitation services to Kumasi; and a program that will strengthen institutional capacity in Ghana to design and implement urban sanitation projects.
develop an implementation strategy for establishing such an approach. The project will also include on-site sanitation, promotion of environmental hygiene, and income-generation activities. GWSC is executing the project in collaboration with RWSG-WA, and it is being funded by CIDA. Another project begun during the past year is the Kumasi Human Waste Management Project, which is supported by UNDP through GHA/87/016.

1988 also saw initiation of a Training Network Center within UST to be funded by UNDP (the Center is funded jointly with the Kumasi Human Waste Management Pilot Project). The Center will build on the existing capabilities of the Department of Civil Engineering, providing a focal point in Ghana for information on water and sanitation technologies appropriate for low-income communities and the strategies and communications skills necessary to implement projects based on these technologies.

The Program's overall goals in Ghana include assisting the government in developing human resources by continuing support for the Training Center; the goal being to help the country establish community-based management of rural water supply and sanitation and to initiate local manufacture of VLOM handpumps. Further objectives involve identifying and preparing urban waste management projects for low-income communities and helping to demonstrate their utility. The Program will also assist the government in the coordination of donor activities in the sector.

A country coordinator, to be stationed in Accra, is being recruited and should be in post by mid-1989.

Guinea

Compared with neighboring countries, Guinea is well endowed with annual rainfall. The water and sanitation sector has received limited attention in the past, and rehabilitation needs are considerable. Urban sanitation coverage is low—part of Conakry has conventional sewerage, but it is functioning poorly. Extending conventional sewerage has proved to be unaffordable, and there is a need to introduce lower cost alternatives.

During 1988 RWSG-WA support activities began with the preparation of community involvement and low-cost sanitation components for a UNDP project in Conakry. This included holding a three-day workshop in mid-1988 for workers in Lanséboundji district. Subsequently, parents of schoolchildren hired these workers to construct latrines in their schools.

Subject to endorsement by the government, the Program plans to intensify its activities in 1989-90, in particular to help the country address institutional and implementation issues in the sector. This will be done, in part, through collaborating with the World Bank in providing assistance for sector review, including institutional and policy review.

Another avenue for future Program support is through the introduction of lower cost sanitation options in strategic sanitation planning and in the preparation of project packages for Conakry and secondary towns. The Program can also supply operational support in the preparation of the community involvement component of the Bank's Second Water Supply Project and for rural water supply.

Mali

Mali, like other Sahelian countries, has a rural population in great need of an adequate water supply. There are currently several ongoing rural water supply projects in the country, but their impact could be strengthened with increased sector coordination. Urban sanitation coverage is high due to a concerted effort in the sector carried out between 1980 and 1985. Sanitation coverage in the rural areas, however, is low.
CIDA is very active in Mali, and is supporting a number of small urban and rural projects. UNICEF's support in water supply and sanitation is continuing within the program of Mali-UNICEF cooperation for 1988-92. Program support activities began in 1988 with assistance to the sanitation component of a CIDA-financed water supply project. This component has now become a freestanding sanitation project. Dialogue with UNICEF and the government of Mali has resulted in the definition of RWSG-WA support to both.

The Program's short-term objectives for Mali are to identify sector support needs, to prepare a sector strategy, and to increase sector coordination. The preparation of a position paper will take into account the outputs and experience of the individual projects supported. Except for agreements in principle in coordination of sanitation subsector activities with CIDA and UNICEF, these objectives have not yet been addressed. A draft proposal for the CIDA-financed sanitation project for Goundam and Niafunke has been prepared and RWSG-WA's collaboration in the project defined.

Niger

The water needs of the population of Niger are met mainly by groundwater. About 35 percent of urban dwellers have access to a water supply through piped systems of various types. Rural inhabitants, who account for more than 80 percent of the total, are served by about 6,000 modern wells. Until recently, sanitation has been neglected, although there has been some work on the strengthening and further development of the sector's institutions.

During 1988 RWSG-WA collaborated with GTZ to design and implement a rural water supply project and maintained support to UNDP and UNICEF on a project to establish community maintenance of 1,124 water points in the Zinder region. RWSG-WA will continue helping with community sensitization in projects in 1989.

Nigeria

Nigeria has a total population of more than 100 million, and a high percentage of the people live in rural communities. Current estimates of rural water supply and sanitation coverage are that safe drinking water reaches less than 20 percent of the population and that sanitation services are lower yet.

The 1980s, however, have seen an interesting, rapid development of rural water supply and sanitation projects as part of primary health care activities, which in five years time went from only a few relatively small demonstration projects initiated with UNICEF to a nationwide program supported by external support agencies, notably UNICEF and the World Bank. In urban areas, coverage is higher but there are problems with service reliability. The government is trying to improve the situation with assistance from the World Bank and other agencies.

The Program's activities in Nigeria started in 1983, when advisory support was
provided to UNICEF in the implementation of the sanitation component of its program support. This was followed by the posting of a Water Supply and Sanitation Adviser in 1985 to assist the Nigerian government in delivery of services to low-income communities. In 1987 a handpump testing program was established in Bauchi State and preparatory work is well advanced toward establishing handpump manufacture. Training programs were established for staff working on sanitation, and as of 1988 the Federal Ministry of Health's

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**Nigeria Project Launched:**

**Sociocultural Study Begins**

With funding from the UNDP and the Netherlands, the largest in-country demonstration project in rural water supply and sanitation ever executed by the UNDP-World Bank Program is being implemented in Nigeria. In October 1988 a Project Document was signed that commits US$3 million from UNDP for the project, which will be active in the states of Bauchi, Benue, Borno, Plateau, and the Federal Capital Territory of Abuja. The Dutch government has contributed US$775,000 to the project, and other contributions are expected to bring total financial support to US$5.5 million.

The Nigerian project, named RUSAFTY, an acronym in Hausa for water, sanitation, and health, gives the Nigerian government and the donor community a chance to build on the successful completion of the Program's first stage of work in Nigeria. That stage involved testing and disseminating information on low-cost technologies and the on-going handpump testing project in Bauchi State. The new project provides a chance to design and carry out an implementation strategy based on community participation. The goal is to set up systems that local governments can operate, integrating water, hygiene education, and sanitation.

The project first studied the sociocultural environment of Plateau State and developed a survey, the results of which will be used to plan the project and to develop a simplified survey methodology for the remaining project states that can be used in other water and sanitation projects in Nigeria.

Other activities planned under the project include:

- developing a local government (LGA) and community-based institutional model for planning and implementing activities;
- helping the territory and states to improve planning, management, and logistical support in installing 500 water points and 1,600 demonstration latrines in five LGAs;
- helping develop sustainable strategies by strengthening drilling agencies;
- providing training for people at community and LGA levels;
- promoting and establishing an improved policy on ownership and cost recovery for community water supply and sanitation; and
- improving personal and environmental hygiene.
sanitation team was conducting its own training courses. The government requested support from UNDP in the rural water supply and sanitation sector. It was agreed that a project be prepared as part of the activity of the Sanitation Adviser. The project document (NIR/87/011) was signed in October 1988.

The handpumps testing demonstration project in Bauchi State made significant progress during 1988. It was initiated to help the government assess the appropriateness of different pumps and their subsequent local manufacture. The project is also developing an approach to community management of water points in collaboration with the Missau Local Government Council. Community development and health staff were recruited and LGA extension agents assigned to the project to help. A draft technical report on handpumps testing, to be finalized in 1989, will form the basis for the government's selection and recommendation of pumps for local manufacture.

RWSG-WA assisted during 1988 with the preparation of rural water supply and sanitation sector memoranda for Anambra and Katsina states (the Katsina state memorandum was completed at the end of the year). As a follow-up to the Anambra State support, a plan of action will now be prepared beginning in 1989. Also during 1988 plans were made together with the British Council to conduct a needs assessment leading to the establishment of Training Network Centers in Nigeria.

Objectives for the coming year will include providing support for the multistate demonstration project in rural water supply and sanitation and the Bauchi demonstration project. They will also include assisting the government with the local manufacture of handpumps and preparing a plan of action for Anambra State. In addition, support will be initiated for implementation of integrated waste management in secondary towns, and a needs assessment for network centers will be completed and funding secured.

Senegal

The government of Senegal has been attempting to address the country’s water supply and sanitation needs since the launch of the Decade in 1981. Provision of urban water supply has kept pace with the population growth, yet rural water supply still lags behind. In sanitation, urban services are improving but rural services, as in so many other countries, are very poor.

RWSG-WA has been active in Senegal since 1986 when it assisted UNDP-Dakar in identifying and preparing several water supply and sanitation projects. Subsequently, the RWSG helped draft a project document (UNDP SEN/87/026) for a Strategic Sanitation Plan for Dakar. The project has now been approved, and implementation will begin in 1989. It is to be executed by the World Bank and supervised by RWSG-WA. Results of this activity will supplement those of other agencies currently working in the sector. Support provided so far has been well received.

In 1988 the Water Resources Planning Project document was reviewed by UNDTCD (acting as executing agency), during which RWSG-WA liaised with DTCD and the government. The Village Waterpoint Management project document, which had been finalized at the end of 1987, was discussed with ILO, the possible executing agency, and with the government. The expected output from this project is effective maintenance systems for water points equipped with handpumps.

A Program Strategy Paper will be prepared in 1989 that will outline possible areas of Program support within the country. This strategy will take into account the lending activities of the Bank and aid provided by other donors. The Program will continue assistance to the government in the sector and has allocated time for the preparation and implementation of a rural water supply
and sanitation demonstration project. Other areas of advisory support are community management and handpump selection and manufacture. The country has asked for Program help in urban sanitation and solid waste management.

Zaire

Zaire is the second largest African country and among the poorest. It supports one of the continent's highest populations and needs development support in all sectors.

Urban water supply is the responsibility of REGIDESO, the country's strong and well-managed water authority. REGIDESO has an extensive training program and is responsible to the Ministry of Energy on technical aspects, and to the Ministry of Investments on financial issues of urban water supply. Rural water supply is the responsibility of SNHR (Service National du l'Hydraulique Rurale) under the Department of Rural Development of the Ministry of Agriculture.

In July 1988 two reconnaissance missions were undertaken to assess the prospects for joint RWSG-KfW-GTZ efforts in promoting the urban sanitation sector as well as in determining rural water supply support. At the request of the French Ministry for Cooperation, a third RWSG mission was organized in December 1988 to assess the rural water supply sector and to propose a plan of action for French cooperation.
During 1988 the Regional Water and Sanitation Group based in Nairobi (RWSG-EA) was strengthened by the addition of four staff members. RWSG-EA’s mission is twofold. Its major goal is to develop, through working with individual country governments, the institutional capacity for large-scale investment in the sector. This includes looking at the sector as a whole and developing a strategy of action that will ensure long-term, sustained development. RWSG-EA also offers a unique opportunity for donor coordination by serving as a mechanism through which governments can request assistance to coordinate donor activities within their countries.

In East Africa, three sanitation projects in which the Program has been active have achieved marked success. In Botswana, major policy shifts toward low-cost technologies have helped widen sanitation coverage. District programs integrating water supply, sanitation, and health education have been launched. In Lesotho, a rural sanitation project, begun as a pilot project in one district, has helped develop the private sector and expanded into a national program covering six districts, with funding guaranteed for the remaining four districts. And in Zimbabwe, a Rural Water and Sanitation Adviser placed in the Ministry of Health has influenced policy significantly through the government’s adoption of a National Master Plan for rural water supply and sanitation.

Botswana

Botswana is a relatively large landlocked country with an arid to semi-arid climate, characterized by low, irregular annual rainfall and frequent drought. The government is devoting considerable effort to assessing and managing its limited water resources, which are now the major constraint to development. Like many African countries,
Botswana has experienced a high urban growth rate. This has resulted in the need to develop appropriate sanitation technology and delivery systems for both informal housing in the urban fringe areas and the formal government urban development program. Populations in the rural areas are often concentrated in large villages that have a similar need for improved sanitation facilities.

Program advisory support started in 1980 under UNDP Project BOT/79/003 with assistance given to the Ministry of Local Government and Lands for the provision of sanitation services, initially concentrated in urban areas. Coverage was gradually extended to rural areas and help given to the activities of the District Councils. Botswana has now made major policy shifts and has generally accepted the principles of appropriate technology. As a result, there has been a substantial increase in water supply and sanitation coverage. In addition, preparation of district programs integrating water supply, sanitation, and health education has also begun.

During the last two years, Program support increased to provide assistance in overall institutional development. Organizational and manpower studies were prepared for the water supply and sanitation sector and recommendations made on specific steps to be taken for strengthening sector institutions. The possibility of further action is presently being reviewed by the government. A tariff study has been prepared separately for rural water supply and sanitation and is to be extended to include urban sanitation. This would provide the basis for the establishment of sector policies on financing and cost recovery.

Preparation for a National Water Master Plan (NWMP) has been an ongoing activity. Terms of reference for consultant assistance have been thoroughly reviewed and finalized; a short list has been made of consulting firms invited to submit proposals. Technical assistance for the NWMP is provided under a UNDP project.

During 1989 the Program will concentrate on supporting the formulation of an overall sector development policy. The Program discontinued its support of a full-time resident adviser in Botswana when BOT/79/003 ended in February 1989. Now any direct support will be provided from RWSGEA. UNDP is financing and OPS executing a technical assistance post that will support the coordination of Master Plan activities. The UNDP project has been extended for a two-year period (through August 1990) and given a wider focus to cover sector development activities.

Ethiopia

After Nigeria and Egypt, Ethiopia is the most populous African country. Present potable water services to the rural population are extremely limited. Government is prepared to devote resources to accelerate the rate of improving and extending services. The external input to the sector is lower per capita than in most of the other countries in the Sub-Saharan region.

The Program has been actively involved in Ethiopia in helping the government prepare a Ten Year Sector Plan and project packages for financing. A US$1.6 million UNDP-financed project (ETH/85/019), including provisions for technical assistance and organizational studies, has been formulated and is under implementation. The two main objectives of the project are to assist the Water Supply and Sanitation Authority (WSSA) in building up its capacity to attract external funding for sector development and to strengthen the WSSA.

During 1988 an organizational report was prepared and approved by WSSA with some modifications. One of the main recommendations in the report is that the status of WSSA be upgraded to that of the Ethiopia Water Works Construction Authority (EWWCA). A government decision on this is needed before other recommendations in the organizational study can be implemented.
and before additional UNDP funds for the implementation phase can be secured. In the meantime, the Urban Demonstration Project will be formulated, and a new accounting manual and procedures implemented in one region and at WSSA headquarters. A tariff study for both urban and rural water supplies is under preparation. Several projects have been formulated through technical assistance and are under review by funding agencies.

A sanitation sector strategy paper has also been completed, discussed at a workshop, and approved by the government. In addition, CIDA funding has been secured for a rural water supply and sanitation demonstration project. Preparation has begun on an Urban Demonstration Project, and assistance provided in preparing a World Bank urban project with a water supply and sanitation component. Handpump manufacturing was given government support.

Future Program plans include completion of the third and final phase of the organizational and management study and formulation of national investment study and formulation of national investment programs for rural water supply, sanitation, and health education, as well as for urban water supply and sanitation. Other objectives are to prepare and implement an integrated rural water supply, sanitation, and health education demonstration project, and an urban sanitation, solid waste management, and resource recovery demonstration project. Program support will also go toward strengthening local handpump manufacturing capacity, and to donor activities and Bank lending operations in project preparation, supervision, and monitoring.

Kenya

Considerable investments have been made in the rural water supply sector in Kenya over the past two decades. During the 1970s and early 1980s, the emphasis was on conventional technologies designed by consulting firms, constructed by contractors, and operated and maintained by the Ministry of Water Development with little participation from the communities concerned. Inadequate resource allocations for operation and maintenance led to widespread malfunctioning of facilities. This has led to a shift in attitude both among the external support agencies and within the government. Donor agencies are now not willing to support conventional technology selections, and the development policy within the government is focused at the district level.

Program activities started in Kenya in 1981. A sanitary engineer and a sociologist were posted in the Ministry of Health during 1985-87. They contributed to turning the Ministry of Health's attention to sanitation, health education, and low-cost water supply activities.

The South Coast Handpumps Project (1983-85) resulted in widespread acceptance and application of handpumps as a viable technology for the provision of community water supplies and the development of a suitable pump for Kenya conditions—the Afridev. In 1985 the project was scaled up into the Kwale District Water Supply and Sanitation Project, financed by SIDA and government, with a local NGO (KWAHO) playing a leading role.

Activities planned for Kenya include support to the government in the formulation of a project document on sector development for UNDP funding; mapping of external support agency (ESA) involvement; support to regular informal meetings (initiated by UNICEF) of ministry representatives and ESAs concerned; assistance to the government and ESAs in project evaluations and in the identification, preparation, and appraisal of integrated projects; and assistance in the extension of local handpump manufacturing capacity. In addition, the Program will help supervise and monitor the Kwale project, and support the Bank's East Africa Department in identifying and initiating projects for Bank lending operations. A multipurpose demonstration water supply project for pastoralists has also been agreed upon.
The International Training Network Within AMREF

For more than 30 years, the African Medical and Research Foundation (AMREF) has been working to improve the health of people in Eastern Africa, mostly in Kenya, Tanzania, southern Sudan, and Uganda. A nonprofit organization, AMREF runs a variety of projects, ranging from disaster response to malaria research. Project funds come from government and nongovernment agencies in Africa, Europe, and North America, as well as from private donors.

Since 1986 the Regional Training Network Center (RNC) for East Africa has been working within the Environmental Health Unit of AMREF. The center, which works with local trainers from Kenya, Ethiopia, Somalia, Sudan, Tanzania, and Uganda in promoting low-cost water supply and sanitation technologies, is jointly supported by the Swiss Development Cooperation and the GTZ. Training workshops on construction of VIP latrines, environmental health, management of water resources, and the promotion of the role of women in water and sanitation are among those given on a regular basis.

Since its inception, the RNC has held more than 30 workshops in Kenya, Tanzania, and Uganda, and is increasingly focusing on the training of trainers. Courses are given to representatives from ministries of health and water, from universities and polytechnics, and from NGOs. Demonstration latrines have been built on the AMREF compound in Nairobi, and information and documentation services are being provided.

In 1989 the RNC will be decentralizing, with the aim of having largely autonomous activities in Tanzania and Uganda.
Lesotho

Lesotho is primarily a mountainous country, physically surrounded and economically dominated by the Republic of South Africa. Surface water of good quality is available from mountain springs throughout the country; however, much of the rural population has no access to a safe water supply.

Program support in Lesotho was provided initially through indirect assistance to an urban sanitation adviser. In 1983 direct support was provided to establish a pilot rural sanitation program in collaboration with UNICEF. This subsequently evolved into a national implementation program integrated into the rural water supply program. In 1987 a new project (LES/86/011) began, which provides support to the second phase of Lesotho's National Rural Sanitation Program (NRSP). By 1988, district programs under the NRSP were operational in six districts. Efforts toward involving the private sector in latrine construction continued during the year. More than 2,500 latrines were constructed in 1988 through the district rural sanitation programs alone.

Significant policy changes have been made and have resulted in a substantial improvement of sanitation coverage, particularly in urban areas. Lesotho's Fourth Five-Year Development Plan, covering fiscal years 1987 through 1991, contained detailed sections on the water supply and sanitation sector, including the NRSP target to have all district sanitation programs underway by the end of 1991.

In 1988 a Health Evaluation Impact Study was completed with funding by UNICEF, ODA, and UNDP. The study, carried out in the Mohales' Hoek district, found that children who live in households with latrines may suffer 24 percent less diarrhea than children living in homes without latrines.

Future plans in Lesotho include the preparation of a water supply and sanitation sector strategy and action plan. The plan will provide a base document for institutional development and for processing integrated projects for donor financing. In addition, future Program support will entail completion of the rural sanitation program and assistance to the World Bank's East Africa Department in sector activities supported through Bank lending operations.

Malawi

While Malawi is a densely populated and poor country, it nevertheless has a remarkable reputation for successful rural water supply development. This reputation is founded on the gravity-fed piped water program that was initiated in the 1960s. The program is still successfully implemented by the Department of Water with substantial support from USAID.

The rural groundwater supply program, which is planned to eventually provide 75 percent of Malawi's population, has had a more problematic history; operation and maintenance are both expensive and inefficient. However, the government is now seriously addressing this problem by endorsing...
a strategy of enhanced community participation in the siting, construction, and maintenance of handpump-equipped wells and boreholes. Provision of sanitation, particularly in fringe areas, lags behind.

The Program has helped promote community management of handpumps and supported local handpump manufacture (Afridev), and in 1985 posted a sanitation adviser, funded from the First Lilongwe Water Supply Project (World Bank), in the Department of Water. In mid-1987 the sanitation adviser was relocated to the Ministry of Local Government to help plan and implement on a wide scale urban sanitation.

During 1988 the Program assisted the government in preparing a Sector Position Paper, an Action Plan, and a Sanitation Sector Strategy Paper. Proposed activities include assisting in the development of a borehole rehabilitation project by establishing operation and maintenance procedures for community management and strengthening relevant institutions as required.

Support will also be given to implement low-cost sanitation in urban areas, as part of the World Bank Lilongwe Water Supply Project, and to plan for sanitation in other urban centers. The Program will also be involved in a USAID-initiated "willingness-to-pay" study. It will help establish policies on recurrent cost recovery for the rural water supply program aimed at a gradual phasing out of government subsidies. The Program also will finalize handpump prototype and performance tests, enhance handpump manufacturing capacity, help the Bank's East Africa Department supervise and review the IDA First Infrastructure Project, and help prepare a training program as a follow-up on recommendations in the Water Master Plan.

Rwanda

For some years, the government of Rwanda has displayed great concern regarding the supply of drinking water to the population, both urban and rural. As a result, water coverage is relatively high compared with many other African countries: 70 percent in urban areas, 64 percent in rural areas. Sanitation in both urban and rural areas is poorly developed. Related sector organizations require substantial strengthening, and there is a lack of qualified personnel at all levels. No public systems exist for excreta disposal or stormwater drainage; in urban areas, solid waste collection is difficult due to lack of personnel and equipment.

Program activities began in Rwanda in 1986-87 with preparation of a UNDP low-cost sanitation (LCS) pilot project in Kigali. During 1988 the Program also supported missions to assist the World Bank in preparation of the LCS component of the Urban Institutions Project. Additional activities included providing technical assistance to the Ministry of Public Works and Energy; preparing and implementing a Sanitation Sector Strategy Seminar; and helping the Bank's East Africa Department in appraising, supervising, and monitoring Bank sector lending operations. A new UNDP project (RWA/89/001) has been initiated that will deal with strengthening institutions that deal with the sanitation subsector.

Sudan

Sector development in Sudan is progressing gradually but service levels are still far from targets. At present, about 47 percent of the urban and 30 percent of the rural population are covered by improved water supplies. It is estimated that adequate sanitation coverage is significantly lower. Sector organizations are inefficient, and planning and coordination of sector activities inadequate. The government, stressing improvement, increased allocations for sector investments in the current four-year plan.

Support through Program activities started in Sudan in 1987 with assistance to the government of Sudan to prepare a Sector Review and Action Plan (SRAP). During 1988, RWSG-EA revised the SRAP document
and prepared a draft proposal for a UNDP technical assistance project, "Strengthening of the Water Supply and Sanitation Sector in Sudan." The two documents and the general concept of the proposed UNDP project were discussed during a November RWSG mission in Khartoum. Final comments on the documents were being received at the end of the year. The idea of improved sector management and coordination was well received by the donor agencies active in the sector. The SRAP process has already improved cooperation among donors, resulting in regular donor meetings with government of Sudan representation.

The government is considering starting handpump manufacture locally in Sudan and has approached UNDP for assistance. RWSG-EA agreed to provide technical assistance in formulating the project. During a December 1988 field mission, it investigated the handpump demand and manufacturing potential in Sudan.

RWSG-EA is also planning to finalize the project proposal to support local manufacture of handpumps. The Program also will help prepare a human resources development plan and work with the World Bank on emergency water supply.

**Tanzania**

The government of Tanzania is strongly committed to the water and sanitation sector, as seen by the creation of an Independent Ministry of Water in 1987. Over 80 percent of the population lives in rural areas, and considerable investments have been made, with the support of several bilateral donors, in preparing and implementing regional water master plans using low-cost solutions. However, as elsewhere, organization and financing of maintenance remain unresolved, leading to severe deterioration of facilities.

In the past the Program has provided support to both the water supply and sanitation subsectors (through UNDP Project URT/84/004). It helped the government plan and implement a large-scale rural sanitation project funded through UNICEF, and prepared and implemented the sanitation components of the Regional Water Master Plans financed by NORAD, DANIDA, and FINNIDA. The Program also promoted the VLOM concept, integrating it into the planning of rural water supply systems; carried out handpump testing; and set up local handpump manufacture.

In 1988 a Sector Position Paper and a final draft of a Sector Strategy and Action Plan (SSAP) were written (the latter included comments received at a donors meeting). To implement the recommendations of the SSAP, a technical assistance project was prepared and discussions initiated with UNDP and bilateral donors to support the project. The project is expected to strengthen the Ministry of Water in investment planning, project preparation, organizational improvements, planning of human resource development, and improving the management of financial and technical information within the Ministry.

The Program in 1988 began a study to develop national guidelines for community participation in rural water and sanitation. It also assisted DANIDA in the evaluation of its rural water supply program. Support was provided to the World Bank in its Public Expenditure Review relating to the sector and in supervising IDA Credit 1312-TA, and workshops were conducted to develop guidelines for operation and maintenance of rural water supply systems. In addition, the Program provided technical advice for improvements in handpump production and set up training visits to neighboring countries for national sector staff. Case studies of sector experience in Tanzania were prepared, and assistance provided in initiating the UNDP/PROWWESS program in Tanzania.

**Uganda**

In the early 1980s fairly elaborate plans were drawn up in Uganda for achieving Decade goals of improved water supply and sanitation coverage for both the urban and
rural populations. However, because of the political upheavals and devastation of war during the past few years, these goals have not been realized.

Since early 1986 the government has renewed its commitment to the water supply and sanitation sector. Unfortunately, much of Uganda's water supply and sewerage/sanitation infrastructure has seriously deteriorated from the last twenty or so years of neglect.

The Program provided support in 1988 during the preparation and implementation of the sanitation component of the IDA Water I Project. It also assisted, under UNDP Project UGA/84/008, in preparing a Sector Strategy and Action Plan (SSAP); in assessing present and projected water well construction activities; and in preparing an on-site sanitation strategy paper.

**Zambia**

Only 32 percent of Zambia's rural population has access to safe water. About 75 percent of rural water supply systems using groundwater sources are boreholes fitted with handpumps. Nearly all urban centers have a public water supply system; however, lack of proper maintenance, combined with rapid population growth, has led to only 70 percent coverage. Most urban centers have waterborne sewerage systems that are inadequate for the growing population. Provision of rural sanitation is considered an individual responsibility, except in rural townships.

Program activities started with participation in an IDWSSD Conference held in Lusaka in November 1986. During the conference the government especially requested assistance in a review of sector management and institutional structures. A reorganizational study was completed under RWSG-EA supervision in January 1988 by a consultant financed mainly by GTZ. Based on the recommendations of this study, a technical assistance project document was prepared (in UNDP format) to implement the study recommendations. UNDP, NORAD, and GTZ are willing to share the cost of the project. The Program also gave engineering assistance for handpump production.

In 1988 a Cabinet Paper was prepared calling for institutional changes based on the reorganization study's recommendations. The paper is being processed through various government departments and should be presented to the Cabinet for approval in 1989. Implementation could follow fairly quickly. The Program is preparing a study on human resource development needs, and providing technical support for handpump production.

**Zimbabwe**

In the past, water supply and sanitation services have been high in the urban areas of Zimbabwe, yet lacking in rural towns and villages. As a result, since independence the government has emphasized improving levels of service in rural areas. A number of planning studies, including a National Master Plan for Rural Water Supply and Sanitation, have been developed.

Program activities began in Zimbabwe in 1984 when a Norwegian-funded Rural Water Supply and Sanitation Adviser was placed in the Ministry of Health to help develop a national rural water supply and sanitation program. Since then, significant policy changes have occurred through the government's adoption of recommendations and guidelines developed through the National Master Plan Study completed in 1984.

During 1988, the Rural Water Supply and Sanitation Adviser in Harare worked with the National Action Committee, which is executing the recommendations of the National Master Plan. He has continued to support development of a proposal to upgrade environmental health aspects in the National Health Information system. In addition, he is assisting in developing a plan to achieve full implementation of monitoring systems and
computer programs on Ministry of Health water and sanitation projects.

Training activities have continued at all levels, from in-service training of health assistants and inspectors to a government-organized national workshop on Community Participation in Water and Sanitation.

During 1988 the Program was involved in establishing a Regional Training Network Center, co-funded by UNDP (ZIM/88/006) and Norway in the Department of Civil Engineering at the University of Zimbabwe. Recruitment of center staff is in progress and initiation of center activities is planned for the second quarter of 1989. After an initial period, the center is expected to reach out to countries included in the Southern Africa Development Coordination Conference of States (SADCC) and will support training and dissemination activities within the university and various government agencies.

A Tripartite Review was held in December 1988, during which it was agreed that the work plan for 1989 should place greater emphasis on new areas of sector planning. Particular focus would be on urban low-cost sanitation, support to planning for sector services to commercial farm workers, and training activities. The Program is also in the process of carrying out a study to determine technical options and their managerial implications for providing district and rural service centers with acceptable and affordable water and sanitation services.
In East Asia, the Program is helping governments address the issues of water pollution and growing demand for service using a wide range of low-cost technology and community-based approaches. Low-cost sanitation components already have been incorporated into World Bank projects in Indonesia, and similar inputs into Bank projects in Thailand are hoped for in the near future. In China and Thailand, the Program has helped with testing and standardizing the design of handpumps, and in Indonesia with developing and promoting the use of low-cost sanitation technologies. In all three countries, the Program has been active in helping governments coordinate decentralization efforts. Thailand and Indonesia offer examples of how nongovernmental organizations with nationwide networks can be used to promote health education and community participation in connection with water and sanitation use. The Program has been less active in the Philippines, but past activity has included assistance with a handpump field trial. The Program plans to step up training support in the Philippines and may in the future work with the Bank on a rural water supply and sanitation project.

China

About 500 million people are without safe water and adequate sanitation in China, about 300 million of them minority groups living in sparsely populated areas in the north and west. The government through the National Patriotic Health Campaign Committee (NPHCC), has placed high priority on providing services to meet basic needs, striving for health improvements that lead to greater productivity. The NPHCC is interested in developing new approaches to providing sustainable community water supply and sanitation facilities, particularly in remote areas.
Program involvement in China began with signing of a handpump testing agreement in 1983. The following year field testing of handpumps began in Hunan and Shanxi Provinces, handpump testing laboratories were set up in Beijing and Changsha, and surveys of locally made handpumps and drilling rigs were carried out. Bilateral support from the Federal Republic of Germany through GTZ provided a drilling rig, a truck, and a drilling expert. A demonstration project conducted in Langfang near Beijing in 1986-87 showed the potential of well drilling, deep well pumps, and village-based maintenance in providing small village water supplies.

During 1988 the Program worked closely with the NPHCC in developing a strategy to provide groundwater-based, community-managed rural water supply systems, and promote improved sanitation and health education. In two large demonstration projects in Inner Mongolia and Xinjiang Autonomous Regions covering 200,000 people each, the Program is helping NPHCC work with minority groups to promote community management and local production of handpumps. Four hundred wells will be drilled in four counties of the two regions, and Ventilated Improved Pit (VIP) latrines will be installed. The pumps will be manufactured at the provincial level. One or two factories in Urumqi that are producing sample pumps will be picked to supply the pumps. Two Training Network Centers are being considered in Beijing and Shanghai to support the projects by training sector professionals, technicians, and trainers.

For the future, the Program office needs to be expanded and staff assignments revised to accommodate the addition of sanitation and operational support activities to the Program's work in China. Operational support is currently limited to supervision of a World Bank Rural Water Supply project and help with preparing a second project, which will include sanitation and primary health care and will cover up to 10 provinces. Problems that slowed the start of the two large demonstration projects, including delays in preparing agreements between different government agencies, are being resolved.

Thailand

Thailand has a long-established rural water supply and sanitation program, with responsibilities spread throughout the various national and local sector institutions. The government is working to better coordinate these agencies and thereby improve policies and performance and reduce costs. Water systems generally are the responsibility of local governments in coordination with the Department of Local Government (DOLA). The Rural Water Supply Master Plan emphasizes the expansion of rain water catchment systems and upgrading, and rehabilitation and construction of wells equipped with handpumps.

Between 1982 and 1986, the Program helped develop and test handpump technology. In 1987 a rural water supply demonstration project helped establish an institutionally coordinated community water supply program, demonstrate village-level maintenance concepts, and standardize handpump design. This helped establish the principle of community management of handpump-based rural water supply services and is leading to the likely adoption of a handpump based on the Korat 608 CTS as the national standard, with support from UNDP (THA/87/002).

The Program's objectives in Thailand are to support Thai efforts to coordinate sector institutions and formulate policies to improve service delivery and maintenance, help prepare a low-cost sanitation component for a Bank project, strengthen the low-cost technology focus of existing human resources development programs through a Network Training Center, and identify possible activities in hazardous waste management. During 1988, the Program cooperated with two government committees, one comprised of the Regional Directors of the various agencies
and the other an Interagency Task Force convened by the Ministry of the Interior, to establish the TP-60 pumphead as a national standard and to promote a national policy of village-level maintenance of handpumps. It also made progress in setting up a Network Training Center hosted by the Provincial Waterworks Authority in collaboration with educational institutions, NGOs, and other sector institutions.

The Program will continue to provide help in implementing a pilot rural water supply project and in installing, monitoring, and standardizing locally manufactured handpumps. The Program will also help with entering plastic direct action handpumps into serial production.

Indonesia

Indonesia's economic adjustments to cope with the impact of reduced oil prices have hampered the government's ability to extend basic services, particularly to the poorest people. The government's goals in the sector are to improve coordination among government units to offset fragmentation of responsibility; strengthen sector capacity, particularly at the local government and community levels, to respond to public demands; facilitate decentralization and integrated infrastructure planning; and develop replicable and sustainable implementation models.

Program activity in Indonesia began in 1982 and has included one project (INS/81/002), which promoted on-site sanitation technologies in low-income urban communities, and a second (INS/84/005), which took a broader approach to introducing lower-cost technologies into government sanitation programs.

During 1988 the latter project supported two groups of demonstrations cofinanced by the World Bank and the Asian Development Bank that tested a community-based approach to providing financial assistance for families to provide their own sanitation improvement. The demonstrations, covering eight urban areas in the province of Central Java, provided families who asked with a small credit to build a private, shared, or communal latrine. The loans are repaid over three years into a community revolving fund. This in turn will provide credits to more families in an on-going program supervised by a community sanitation group in each location. Approximately 1,000 families have participated and the program has expanded to four other large cities and three provinces.

The pilot projects have demonstrated the importance of community participation in providing sustainable on-site, privately owned sanitation facilities. This has led to inclusion of a low-cost urban waste and wastewater disposal component in current World Bank-financed projects in Jakarta and of low-cost sanitation concepts in the formulation of a national human waste disposal strategy. The country's Fifth Development Plan will reflect this emphasis. Low-cost sanitation programs are expected to be implemented on a broad scale. Two Training

Open sewers in Semarang, Indonesia.
Network Centers have been set up, one at the Institut Teknologi Bandung and another at Cipta Karya.

The Program's objectives are to speed sanitation development by helping the government improve sector policies, develop guidelines, improve management and institutions, and build a foundation for their continued development. The Program is launching a project in 1989 (INS/88/005, funded by UNDP and the Dutch government) to help the government develop policies and guidelines for community water supply and sanitation implementation and apply them to a large-scale demonstration in rural and urban areas, develop a social marketing program to increase awareness and demand, and train local government staff in sanitation planning.

The initial phase of assistance to the Training Network Centers will terminate in 1989. A new combined project encompassing three lines of training through the Ministries of Public Works, Health, and Education is proposed. The project will be coordinated by an interministerial group, and probably will be closely linked to the Community Water and Sanitation Project. Funding has not been secured.

Philippines

The Republic of the Philippines in 1986 reallocated responsibilities in its water supply and sanitation sector. The Local Water Utilities Administration (LWUA), which had been responsible for water supply in provincial urban areas, was given the added mandate of village water supply. LWUA also has moved into sanitation activities, and the Department of Health's primary health care program has an extensive network of rural sanitarians. The Water Supply, Sewerage, and Sanitation Master Plan outlines sector policy and investment programs. The government has expressed interest in receiving technical assistance to support its activities.

The Program has provided technical assistance on microcomputers for planning and design of water supply systems, and helped with a handpump field trial. Preparatory steps have been taken for establishment of a Training Network Center. During 1988 a project proposal for establishment of the center was appraised by the Dutch government. In addition, a case study on the Bank's First Rural Water Supply and Sanitation Project was done to draw lessons for training purposes.

The Program is considering extending technical assistance to practicing engineers on appropriate technologies and approaches in water supply and sanitation. The Program will also help implement an ongoing information project to integrate hygiene, health, water, and sanitation concepts in primary and secondary education. The proposed Training Network Center will institutionalize these activities. Future activities in the Philippines could also include close collaboration with the Bank in preparing a rural water supply and sanitation project.
India, Pakistan, and Bangladesh have made impressive efforts to expand water and sanitation coverage and have ambitious national programs to widen their reach even further, but resources are limited and the number of uncovered poor remains great. Moreover, not everyone in the covered areas has benefited, and this has diluted the health benefits of the projects. The same problems of increasing urban populations and fast-growing demand plague these countries as they do East Asian nations.

The Program's work in South Asia runs the gamut: from the Mirzapur integrated water-sanitation-hygiene education demonstration project in Bangladesh, which showed positive health results, to testing and developing handpump and inexpensive sanitation technologies in India and Bangladesh, and solid waste management and resource recovery technologies in Sri Lanka. The Program is working with the Bank to prepare major rural water supply and sanitation projects in India and Pakistan.

During 1988 a Regional Water and Sanitation Group for South Asia was set up in New Delhi to coordinate donor assistance in the country and region and in all aspects of sector development.

India

Of India’s 800 million people, an estimated 273 million live in absolute poverty. Of these, 80 percent live in rural areas where health standards are much lower as evidenced by higher infant mortality rates. The country has an impressive rural water supply program. A borehole drilling program operates in 18 states. Over 3,000 borehole drilling rigs from the public and private sector sink some 50,000 tube wells annually. An estimated 2 million
Strategy Paper Prepared for India

The UNDP-World Bank Program has been instrumental in the development of a Rural Water Supply and Sanitation Strategy Paper for India, prepared in conjunction with the World Bank's Country Operations Division. The paper was prepared following a joint mission in June 1988 to seven states to review the rural water supply and sanitation sector. The paper will set the stage for increased involvement by the Bank in the rural water supply and sanitation sector in India.

There are currently an estimated two million handpumps in operation in India. Over the past ten years the government has provided one protected water source in each problem village, a problem village being one that has no source closer than 1.6 km, has contaminated groundwater, or suffers from endemic disease such as guinea worm. However, because villages are often large and may consist of small subdivisions or housing groups, not all residents benefit equally. In reality, coverage appears to be much less than the 85 percent claimed by the government. It is estimated that less than 50 percent of the population use protected water sources. Levels of sanitation service are even lower, with less than 2 percent of the rural population having access to a latrine. Seweragesystems for villages and small towns are virtually nonexistent.

Strategies for combating this problem, as outlined in the paper, include strengthening the capacity of government to mobilize resources, involving the private sector and communities more in project planning and implementation, improving financial performance and cost recovery for capital investment and operation and maintenance, and developing mechanisms for effective coordination between sector institutions.

Handpumps are in operation, including about one million India Mark II pumps developed with the help of UNICEF. Regional piped water schemes are common where tube wells are less viable. The government program has succeeded in providing one protected water source for 85 percent of all villages with distant or contaminated water supplies.

But still less than half the population of covered villages use protected water sources, and this dilutes the health benefits of the effort. To maximize health benefits, an integrated approach to service provision including water, sanitation, and health education must be used. Flexibility is needed in choosing service levels and technologies to stimulate and respond to demand. And institutions must be strengthened through involvement of communities, nongovernmental organizations, and the private sector.

The Program has helped the government move toward low-cost sanitation policies and programs since 1978 through preparing feasibility studies for large-scale projects and building demonstration latrines. It also helped refine the modified India Mark II handpump and promote village-based operation and maintenance systems, and technical assistance was provided to the Central Ganga Project on wastewater management, wastewater aquaculture, and agriculture. India is giving low-cost sanitation serious attention across the country, with US$230 million allocated for rural sanitation alone in the
Seventh Five-Year Plan. The World Bank has allocated about US$55 million for low-cost sanitation components in its water and urban projects. The government is expected to commit significant resources to rural and urban water and sanitation in its Eighth Five-Year Plan.

The Program is helping the World Bank identify and prepare a major rural water supply and sanitation project in India. The project will address, among other things, strengthening local governments' capacity to mobilize resources, promoting involvement of communities and the private sector in projects, and improving financial performance and cost recovery for capital investment and operations and maintenance. The Program is conducting demonstration projects in four states that will develop strategies for community-managed and financed maintenance systems for rural water supplies and for integrated sanitation and health education.

The Program will continue to help refine the design of the modified India Mark II handpump, analyze the economic viability of biogas from human wastes and other intermediate technologies, and further develop the Ganga Action Plan. Training Network Centers were in operation in Madras and Calcutta in 1988. The Program will continue to provide assistance to a variety of projects funded by multi- and bilateral sources in Tamil Nadu, Kerala, Gujarat, and Madhya Pradesh.

Pakistan

Pakistan has very low rural water supply and sanitation coverage and a rapidly growing unserved peri-urban population. The government's Five-Point Program covering 1986-90 aims at providing 26 million more rural people with water supply and 7 million with sanitation or drainage, or both, at a cost of about $500 million. This ambitious plan is being carried out by sector institutions with limited resources and experience in the range of alternative technologies and management systems to ensure sustainable services.

The Program worked with the World Bank's Europe-Middle East-North Africa Country Department (EM11N) during 1987-88 in preparing a Rural Water Supply and Sanitation sector review and a follow-up sector workshop and conference held in Pakistan, and in launching a major investment planning and project preparation exercise. The Program also has advised on groundwater resource and waste management aspects of urban projects. Efforts have promoted policy shifts and major investment in the sector, marked by innovative approaches to sector development.

A major step-up in the Program's activities in Pakistan is scheduled in 1989. The Program will work with the Bank on a major water supply and sanitation project, due for appraisal in October, to help the government increase rural poor coverage. Alternative models to the Central Public Engineering department will be developed to give local government a stronger role and to provide credit and training to strengthen nongovernmental organizations and village...
decision making. A country coordinator will be stationed at the Bank's resident mission in mid-1989.

The Program will actively help the provincial and federal governments in investment planning and preparation, designing of demonstration projects, training of sector personnel, institutional development, and support of the private sector. It will broaden urban sanitation and waste management activities through work on the proposed urban environments project. An early task for the country coordinator and the new South Asia RWSG will be development of a Program strategy, in close consultation with the government.

**Bangladesh**

Bangladesh has made significant progress in the water supply and sanitation sector with financial assistance from UNICEF, financial and technical assistance from the World Bank, and support from private voluntary agencies. The government plans to install 50,000 Tara handpumps during the third Five-Year Plan and is preparing a national sanitation plan.

The Program has been active in rural water supply in Bangladesh since 1983 and in low-cost sanitation since 1985. During 1988 it executed a Low-Cost Sanitation Project (BGD/85/004) under which demonstration latrines have been built in 51 towns, local municipal officials trained, and a national urban sanitation investment plan for small towns prepared. These procedures and standardized designs will be replicated throughout the country, and a strategy paper for urban sanitation implementation is being prepared. Based on this experience, the Bank has included a low-cost sanitation component in its Dhaka and Chittagong projects.

During 1988 the Program continued to manage the Mirzapur rural water supply, sanitation, and hygiene education demonstration project and health impact study which began in 1983. Under the project, village women are taking on the role of managing multifamily water supply systems and building latrines. A health impact study was conducted during 1988 to see if the project had succeeded in reducing child mortality and morbidity due to water- and excreta-related diseases. The study involved an intervention community and a control community in which no intervention took place. The study showed that the rate of incidence of diarrhea in children under five years fell in both the study areas, but significantly more so in the intervention area.

The results of the study have important policy implications in that they prove that community involvement in project activities is important for the acceptance and sustained use of the improved facilities and that integrated water, sanitation, and health education components are essential.

Plans are also underway in Bangladesh to set up a Training Network Center. As an extension of the Mirzapur project, the Program will also help the government set up a monitoring system to check the performance of Tara handpump installations; develop community-based management guidelines; and finalize assessments of the impact of water supply, sanitation, and health education on child mortality and morbidity. The Program will help develop other related projects in both rural and urban areas, extend the existing Low-Cost Sanitation Project, and develop a case study on rural water supply and sanitation.

**Sri Lanka**

Political and social unrest have hampered activity in Sri Lanka's water supply and sanitation sector in recent years and the Program has only had limited involvement since 1984. The sector will likely receive high priority in reconstruction efforts, and the Program will assist the government and
bilateralas in preparing a rural water supply and sanitation project and support standardization of handpumps.

Subject to discussions with the government and potential donors, the Program will also help implement a pilot resource recovery project demonstrating low-lying land reclamation with refuse and composting of solid waste. This is expected to complement the Bank-financed Municipal Management Project. The Program will also study the potential for setting up a Training Network.

Nepal

Nepal is one of the poorest countries in the world, land-locked and isolated by natural and other barriers, with a low level of economic development. The government, as part of a program to provide basic needs to the population by the year 2000, is working to improve rural water supply and rural and urban sanitation service levels.

The Program was not active in Nepal in 1988 except to provide technical assistance to the World Bank's operations. The main sector goals as identified by the Bank are to strengthen management and operations of the water agencies, help improve service delivery and financial viability in urban areas, and develop a rural water supply and sanitation strategy and treatment program, particularly emphasizing sanitation improvement. The Program will focus its support on this latter objective.
From 1980 to 1985, some 69 million additional people benefited from water supply and 50 million from sewerage services in Latin America. However, almost one out of four people still do not have access to adequate drinking water and 157 million (41 percent of the population) lack excreta disposal facilities.

Program activities in Latin America have been limited to date. A Regional Water and Sanitation Group will be established in Latin America in 1989, and activities will be focused primarily in four countries: Bolivia, Brazil, Peru, and Guatemala.

In Bolivia, demonstration and testing of handpump designs has started and village level operation and maintenance is being promoted. Sector work and a large-scale demonstration project should start soon. In Brazil, initial pilot work has been done on use of appropriate sanitation technology. A research and development project on water conservation through wastewater treatment and reuse for aquaculture financed by GTZ under Program direction is being executed in Peru. A similar project is being organized in Mexico. Training materials have been adapted and translated into Spanish and Portuguese, and training centers are being established in Central America.

**Bolivia**

Bolivia has one of the lowest service levels for water supply and sanitation in Latin America. It also has the second highest infant mortality rate and lowest life expectancy in the region. Low service levels are particularly acute in the rural areas where 56 percent of the population lives. Only 10 percent of the rural population has installed potable water systems, and almost all of those served are in the larger rural towns. Almost none of the
dispersed rural population has access to an adequate water supply. There is a recognized need for lower cost and more maintainable alternatives for rural water supply systems.

Low-cost sanitation is needed in urban fringe areas and the larger rural towns where conventional sewerage is not affordable. Urban migration is proceeding at a rapid rate, and the urban population is soon expected to account for over 50 percent of the total population. This will result in expanding urban fringe areas with inadequate services. The principal issues impeding sector development are: often inappropriate technology choices, limited institutional capacity, and inadequate investment levels.

Activities of the Program in Bolivia have focused primarily on the urban areas where the majority of the poor and unserved population are found. However, increasing attention will be given to the serious and rapidly growing needs of peri-urban areas.

During 1988 the Program tested and demonstrated handpump design and promotion of village-level operation and maintenance and helped establish in-country handpump manufacture. The Program also developed a project package for financing by UNDP; it comprises a small-scale (4,000 beneficiaries) demonstration project and rural project, including a sector study and technical assistance. A large-scale (up to 100,000 beneficiaries) demonstration project was prepared and submitted to the Dutch government for funding; approval is likely and the demonstration should begin by the end of 1989.

The Program is also participating in identifying and appraising an Integrated Health Development Project to be financed by the World Bank. The project would include a substantial basic sanitation component for peri-urban areas for the cities of Santa Cruz, Cochabamba, and El Alto. A major focus will be on community participation, health education, and partial cost recovery.

**Mexico**

The Program has been working on the preparation of a water conservation program through waste management and industrial waste treatment in Mexico City. A proposal for funding of the project (US$6 million) has been submitted to the Italian government. The project will demonstrate the possibility of the reuse of wastewater in areas like Mexico City where water is scarce.

At the World Bank's request, the Program will co-sponsor a water and sanitation seminar to take place in Mexico City with participation of people from Mexico and Central America. The seminar will focus on intermediate solutions and will provide an opportunity for the dissemination of the translated training materials prepared by ITN.

The Program will also assist the Bank's operational department for Mexico in identifying and appraising water and sanitation projects where nonconventional approaches could be applied.

**Peru**

In 1988, the demonstration project on sewage-fed aquaculture at the San Juan ponds (Lima, Peru) continued research. It is being executed by CEPIS/PAHO in cooperation with Peruvian water and sewerage authorities (SENAPA). Funding comes from the UNDP-World Bank Program and GTZ.

The project is a follow-up to a research project that established the technical feasibility of growing tilapia and carp in well-managed fishponds receiving treated effluents from waste stabilization ponds. Survival, growth, and sanitary quality of fish, and pond water quality, proved satisfactory. The demonstration's aim was to determine the best combination of stocking density, loading rates, and seasonal growing periods to optimize fish production, and the economic feasibility.
Latin Americans Commit to Poor
At Recife Meeting Sponsored by Program

Representatives of 21 Latin American countries expressed support for extending water supply and sanitation services to low-income groups at a seminar sponsored by the Program and held in Recife, Brazil, September 29 to October 5, 1988. The Latin American Seminar on Water Supply and Sanitation for Low-Income Populations attracted more than 130 participants from 45 countries including observer-experts from China, India, Egypt, Tanzania, and Nigeria and bilateral and multilateral donors. A statement drawn up by meeting participants declared that “the numbers of individuals without service will reach alarming proportions unless radical measures are taken to make water and sanitation top priorities.”

Conference participants agreed in the Recife Statement that much can be done to reach the unserved by cooperating regionally, mapping an overall strategy, using low-cost technologies, and spurring community involvement. They called for discussions with communities at risk to see what action to take in the sector, and establishment of mechanisms to enable women to participate in all project planning and implementation. The statement also urged placement of higher priority on areas with little or no service coverage and the decentralization of funds and decision making.

After the conference, the Program's Advisory Panel met in Recife for two days to discuss future Program activities. Panel members included China's Zhang Chong-Hua, Chief Engineer, Federal Environmental Protection Agency; Tanzania’s M.K. Msimbira, Principal Secretary for the Ministry of Water; and representatives of WHO, UNICEF, Alexandria University's High Institute of Public Health, and the University of Mexico’s Institution of Applied Mathematics.

and social acceptability of sewage-fed fishculture.

Progress in 1988 included construction of a large-scale facility for controlled replicate experiments and a special reproduction and rearing facility for juvenile fish. The first of four planned experiments was completed in December. It tested the effect of fish stocking densities at a constant sewage fertilization (loading) rate during the winter season. The results showed acceptable productivity despite unusually cold temperatures. It is expected that the repetition of this experiment during the warm season will significantly improve productivity.

Two papers on the San Juan sewage-fed fishculture project were presented at a recent international seminar on Wastewater Reclamation and Reuse for Aquaculture that was held in Calcutta. The results obtained at San Juan are influencing design criteria for fishculture systems in India and elsewhere.
Regional Activities in the Europe, Middle East and North Africa Region

Waste management problems in the Europe-Middle East-North Africa (EMENA) region are exacerbated by high population growth, rapid urbanization, and inadequate social and economic infrastructure. Semi-arid areas are plagued by additional water resource problems, including competition among people and animals for limited water, which fuels the desertification process. The Program is supporting waste management improvement efforts in the area through two regional UNDP projects, one dealing with municipal solid waste resource recovery technologies in European countries, the other, executed by the UN’s Food and Agriculture Organization (FAO), promoting wastewater reuse in the Middle East. Representatives from 20 countries identified the most pressing solid waste management problems facing the region at a symposium on Integrated Resource Recovery from Municipal Solid Waste in Bled, Yugoslavia, in early 1988, sponsored by the Program in conjunction with the International Center for Chemical Studies, Ljubljana, Yugoslavia. The Program also collaborated with FAO in organizing a regional seminar on wastewater reuse.

Resource Recovery—European Network

The objective of the European regional resource recovery project (RER/87/023) is to achieve cost-effective, safe, and environmentally sound recovery and recycling of municipal solid wastes in the European countries of the region. To do this, it will identify replicable resource recovery and recycling systems through a case study survey;
design a Regional Action Program of training, technical assistance, and exchange of information on the basis of the survey; and initiate a self-sustaining Regional Network to implement the action program. The first two objectives were achieved in 1988 with the organization of the symposium in Bled, Yugoslavia, and the issuance of an action program.

### Bled Symposium: Recycling of Municipal Solid Wastes

From February 24 to March 1, 1988, a regional UNDP-World Bank Symposium on Integrated Resource Recovery from Municipal Solid Wastes in Europe was held in Bled, Yugoslavia. The symposium was initiated by the Program following a UNDP-European Task Group decision to include a resource recovery program in UNDP activities in Europe.

Organized by the International Centre for Chemical Studies of the University of Ljubljana, the symposium was attended by participants from ten UNDP-assisted countries and by experts from nine observer countries. The meeting focused on four subject areas: 1) materials recovery and recycling from municipal solid wastes (MSW); 2) MSW incineration and energy recovery; 3) landfill gas recovery; and 4) composting of MSW in Europe. Representatives from UNDP IPF-countries presented papers during the meeting, as did representatives from observer countries. The material will be published in the journal *Resources and Conservation* as proceedings of the symposium.

The meeting concluded with the participants' endorsement of the "Bled Statement," which outlines the importance of resource recovery and recycling as an effective means of improved waste management, together with a recommendation for the establishment of a regional network for information exchange, monitoring, research, and technology transfer among European and Mediterranean countries. Considerable interest was expressed during the meeting in low-cost, appropriate technology systems, with a major constraint being the need for sufficient, clear, and unbiased information for effective decision making. The proposed network will play a major role in making such information available.

In 1989 the Program will focus on creating a self-sustaining Regional Solid Waste Management Network in the region. A project document for establishing the network is being drafted. As proposed, the network would address four areas: materials and energy recovery; composting; landfill management and landfill gas recovery; and
policy planning and infrastructure support. The project document will be presented to
UNDP and UNDP-assisted countries of the region, and other European countries will
be approached to support the Network's activities. The Network will probably be based
at the International Center for Chemical Studies in Ljubljana, Yugoslavia.

Water Supply, Sanitation, and Waste Management
in the Arab States Region

Approved during 1988, this project (RAB/88/009) has three major objectives:
human resource development; improvement of water supply and sanitation services; and
improvement of waste management/resource recovery practices. By linking these
objectives into one project, the Program has acknowledged the damage to water
resources (and the environment in general) caused by the improper handling of wastes.
The Program has also recognized the role of local decision makers in implementing
solutions to the problem.

Specific activities will include extending the UNDP-World Bank International
Training Network (ITN) for water and waste management to the region; translating and
adapting ITN materials; completing a survey of waste management and resource
recovery practices in ten countries of the region; identifying, promoting, and implementing
pre-investment projects in waste management; and organizing regional and country
workshops on waste management/resource recovery and appropriate water supply and
sanitation technologies.

The survey will be done in 1989 in collaboration with the World Bank. Discussions
are under way for the participation of WHO and FAO in this mission by providing
specialists and local coordination.

A proposal is being discussed with the French government for support of
activities related to project RAB/88/009 in three Maghreb countries (Algeria, Morocco,
Tunisia). The project would provide for improvement of water supply and sanitation
coverage and waste management and recycling practices in the region, and a full-time
waste management specialist would be appointed to oversee project activities in the
Maghreb region and to coordinate project activities with other countries. This specialist
could later become part of a Regional Water and Sanitation Group planned in the
EMENA region.
ANNEX: 1988 GLOBAL OUTPUTS

MEETINGS


PUBLICATIONS


"Material de Información y Capacitación en Abastecimiento de Agua y Saneamiento de Bajo Costo" (instructor and participant manuals), September 1988; (audio cassettes), December 1988. Spanish translation.

Matièrils de documentation et de formation sur l'alimentation en eau et l'assainissement à faible coût (slides, instructors manuals, participants manuals, audio cassettes, and three movies), May 1988. French translation.


JOURNAL ARTICLES


CONFERENCE PAPERS


Bartone, Carl. "Reuse of Treated Pond Effluents for Fish Culture in Lima, Peru." Presented at the International Seminar on Wastewater Reclamation and Reuse for Aquaculture, Calcutta, India, December 6-9, 1988.


WORLD BANK TECHNICAL PAPERS AND DISCUSSION PAPERS


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