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ENVIRONMENTAL SERIES NO.3

Drinking Water Supply and Sanitation: The International Decade in the Americas

for
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World Bank

INCLUDES FEATURES ON:

- Planning
- Community Participation
- Appropriate Technology
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Resource Development
- Financing

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The United Nations symbols shown here represent two major social goals to which the citizens and leaders of countries throughout the world aspire. One, "health for all by the year 2000," targets the attainment by everyone everywhere by this century's end of a level of health that would permit them to lead socially and economically productive lives. The other goal, depicted by ten small drops of water within a larger, all-encompassing one, suggests the ten years and the ultimate aim of the International Drinking Water Supply and Sanitation Decade, 1981-1990.

The two symbols are here joined with a purpose, namely to reflect that access to drinking water and sanitation services is a critical precondition to the attainment of universal health. The challenge implied in providing these services is a formidable one: today only about one-third of those living in the world's least developed countries have dependable access to a safe water supply and adequate sanitary facilities.

In comparison to other parts of the developing world, the Region of the Americas has advanced much farther down the road toward the provision of social services and the achievement of collective well-being. Still, to paraphrase the words of one American poet, there remain promises to keep and miles to go before we sleep. In pursuit of the challenge ahead, the Pan American Health Organization, working in concert with all the governments of the continent, is applying its energies and resources to achieve the goals of water, sanitation, and health for all.



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**Drinking Water Supply and Sanitation:
The International Decade
in the Americas**

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ENVIRONMENTAL SERIES NO. 3

**PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION
525 Twenty-third St., N.W.
Washington, D.C. 20037, U.S.A.**

1983

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PREFACE

In the Region of the Americas, in consonance with the goal of the International Drinking Water Supply and Sanitation Decade, the Member Governments of the Pan American Health Organization, at the PAHO Directing Council held in 1979, resolved to adopt strategies aimed at providing those services to as many people as possible by 1990. The strategies singled out in that resolution are, simply put: planning, community participation, appropriate technology, institutional and human resource development, and financing.¹

In order to more fully understand the context of the Decade in the Americas, the need was perceived to describe the historical background leading up to its launching, the current situation regarding the strategies to be employed, and the challenge implied in their future application. It is in response to that need that this volume is published.

Drinking Water Supply and Sanitation: The International Decade in the Americas represents the third issue in a PAHO series on environmental health.² The purpose of the series is to provide information on the environmental health problems experienced by the countries of Latin America and the Caribbean and the measures they are applying to solve them. PAHO serves to cooperate technically with the countries in their efforts to prevent and control environmental conditions and factors that adversely affect the health of man. Resources at the Organization's disposal to provide that cooperation include: regional advisers in the Environmental Health Program (HPE) at PAHO Headquarters in Washington, D.C.; the Pan American Centers for Sanitary Engineering and Environmental Sciences (CEPIS) in Lima, Peru, and for Human Ecology and Health (ECO) in Metepec, Mexico; and PAHO engineers working in the countries. National authorities interested in seeking the Organization's technical cooperation in the area of environmental health should contact the PAHO Country Representations in the respective countries.

¹Further information provided in *Strategies for Extending and Improving Water Supply and Excreta Disposal Services during the Decade of the 1980s*. PAHO Scientific Publication 390. Washington, D.C., 1979, which can be obtained by writing: Distribution and Sales, PAHO, 525 Twenty-Third St., N.W. Washington, D.C. 20037, U.S.A.

²The first two issues were: *Environmental Health Activities of the Pan American Health Organization* (1981) and *Environmental Health: Country and Regional Activities in the Americas* (1982). Both issues are also available in Spanish under the titles *Actividades en salud ambiental de la Organización Panamericana de la Salud* and *Salud ambiental: Actividades nacionales y regionales en las Americas*. Copies can be obtained by writing the Environmental Health Program (HPE), PAHO, 525 Twenty-Third St., N.W., Washington, D.C. 20037, U.S.A.

Chapter I

The Decade: Historical Background and Challenge for the Future

“Between 20 and 25 million children below the age of five die every year in developing countries, and a third of these deaths are from diarrhea caught from polluted water. All these deaths cannot be eliminated just by providing safe water and sanitation; but there can be no lasting improvement of public health without them.”

*Report of the First Independent Commission on
International Development (commonly known as the Brandt Commission)*

Drinking Water and Sanitation: The Road to Health

More acutely than ever before, recent years have witnessed a growing awareness among Governments throughout the Americas, reflective of a global consciousness, that health is a human right, that it can no longer be considered a privilege. That awareness has triggered a collective commitment of countries, hemisphere wide and the world over, to act so that everyone might enjoy health and thus lead full lives.

Countries from every continent—in an effort to devise their strategies, set their targets, and plan their actions for assurance of the well-being, worldwide, of their people—participated in the International Conference on Primary Health Care (Alma-Ata, U.S.S.R., 1978). In closing, they issued a Declaration, salient points of which are that Governments should:

- Seek attainment for all people by the year 2000 of a level of health that will permit them to lead socially and economically productive lives.
- Formulate action plans to launch and sustain primary health care, mobilize national resources, and use available external resources rationally.
- Support national and international commitment to primary health care and channel increased technical and financial support to it, particularly in developing countries.

The Conference described primary health care as including: education concerning prevailing health problems and the methods of preventing and

controlling them; promotion of food supply and proper nutrition; *an adequate supply of safe water and basic sanitation*; maternal and child health care, including family planning; immunization against the major infectious diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries; and provision of essential drugs.

The Conference thus echoed the realization, voiced by a number of international assemblies, that the attainment of health is inextricably linked to the provision of safe water supplies and sanitation. In fact, of all types of development projects, water supply and sanitation stand out as having the greatest potential for directly benefitting people's health and social and economic well-being. Provision of those services can, foremost among benefits, mitigate the waterborne or related diseases that lead to such high morbidity and mortality rates, particularly among children. For that reason, the United Nations General Assembly has designated the 10-year period 1981-1990 as the "International Drinking Water Supply and Sanitation Decade."

The Decade: Culmination of Decades

Viewed historically, the Decade is the latest and most ambitious commitment by the world community to extend its citizens the very basic of human services—the supply of drinking water and the disposal of human wastes. It is the most far-reaching such campaign to date in that it aims to provide water and sanitation services to as many people as possible by the end of the ten-year period. It is indeed the latest effort to do so, but far from the first: in Latin America and the Caribbean, governments have for decades united in their common will to avail these benefits to ever-greater numbers of the population. A summary listing of the historic declarations toward this end serves to illustrate that intent:

Charter of Punta del Este of the Governments of Latin America and the Caribbean (1961): "Drinking water and drainage should be made available to at least 70 per cent of the urban population and 50 per cent of the rural population by 1971."

Ten-Year Health Plan for the Americas (1972) of the III Special Meeting of Ministers of Health of the Americas: Recommends that the Governments "provide water supply through house connections to 80 per cent of the urban population or, as a minimum, reduce that population currently

without water services by 50 per cent; provide water supply to 50 per cent of the rural population or, as a minimum, reduce that population without service by 30 per cent; provide sewerage service to 70 per cent of the urban population or, as a minimum, reduce that population without service by 30 per cent; (and) provide sewerage service or other sanitary means of excreta disposal to 50 per cent of the rural population or, as a minimum, reduce that population without service by 30 per cent.”

United Nations Conference on Human Settlements, HABITAT, Vancouver (1976): Recommends that “safe water supply and hygienic waste disposal receive priority” and that “Governments adopt programs with realistic standards for quality and quantity to provide water for urban and rural areas by 1990, if possible;” and that they adopt “programs for the sanitary disposal of excreta and wastewater in urban and rural areas.”

United Nations Water Conference, Mar del Plata (1977): “The Decade 1981–1990 should be designated the International Drinking Water Supply and Sanitation Decade and should be devoted to implementing the national plans for drinking water supply and sanitation. This implementation will require a concerted effort by countries in the international community to ensure a reliable drinking water supply and provide basic sanitary facilities to all urban and rural communities. . . . Priority should be given to the provision of drinking water and sanitation services. . . . in rural areas and urban-fringe areas populated by low-income groups.”

International Conference on Primary Health Care (Alma-Ata, 1978): “A main target of governments, international organizations, and the whole world community in the coming decades should be the attainment by all peoples of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life. Primary health care is the key to attaining this target as part of development and in the spirit of social justice. Primary health care includes at least (among other things) an adequate supply of safe water and basic sanitation.”

Directing Council of the Pan American Health Organization (Washington, D. C., 1979): Adopts the report of the Technical Discussions on “Strategies for Extending and Improving Water Supply and Excreta Disposal Services during the Decade of the 1980s.” (Those strategies are more specifically discussed later in this chapter.)

General Assembly of the United Nations (New York, 1980): “Proclaims the period 1981–1990 as the International Drinking Water Supply and Sanitation Decade, during which Member States will assure a commitment to bring about a substantial improvement in the standards and levels of services in drinking water supply and sanitation by the year 1990.”

Plan of Action for the Implementation of Regional Strategies for Health for All by the Year 2000 (Washington, D.C., 1981): Defined “specific targets as essential to the overall goal of Health for All by the Year 2000. Neither pedestrian nor utopian, they constitute minimum standards for social equity:

- No country in the Region will have a life expectancy at birth of less than 70 years.
- No country in the Region will have an infant mortality rate of more than 30 deaths per 1,000 live births.
- No country in the Region will have a mortality rate higher than 2.4 deaths per 1,000 children aged 1–4.
- Immunization services will be provided by 1990 to 100 per cent of children under one year of age against the major childhood diseases, and that coverage will be maintained during the final decade of the century.
- Access to safe-drinking water and sewage disposal will be extended to 100 per cent of the population.
- Finally, access to health services will be extended to 100 per cent of the population.”

The above proclamations, spanning a period of over 20 years, attest to the hemispheric and universal recognition that safe drinking water and adequate sanitation represent the most basic of public services and that they are vital to the assurance of peoples’ health and well-being.

The Decade of the 1960s

Even before the Charter of Punta del Este, drinking water and sanitation services were understood to provide multiple benefits: reduction in the incidence of many diseases, increase in productivity and socio-economic development, enhancement of food production and nutrition, incentives to construction of new housing and industries, and promotion of tourism. Still, formidable obstacles mediated between the poor coverage figures and the aspired goals, most notably weak institutions, insufficient investment capital, and a generally poor return on investment in water supply and sewerage projects (in fact, many of the countries considered that people should be provided water free of charge).

As a result, two decades ago—with the population of Latin America and the Caribbean at 209 million—102 million in urban and 107 million in rural areas—in urban areas, 60% had water services and 28% had sewerage, while in rural areas less than 8% had water services at home or through public taps and a negligible percentage had waste disposal facilities.

Notwithstanding the constraints to progress, the challenge of Punta del Este was largely met: the urban plan of providing water and sewerage services to 70 per cent of the population was completed satisfactorily. Of the total urban population—estimated at 155 million—more than 121 million (78 per cent) came to benefit from public water services. In the same period 59 million (38 per cent) of the urban population benefitted from public sewerage services. The rural program more than doubled existing water services from 1960 to 1970. In 1971 it reached 31 million people, or 24 per cent of the total rural population estimated at 131 million. Although the rural goals were not fully achieved, the effort constituted a solid basis for future rural progress.

Among other achievements attained during the 1960s were: realization that consumers should pay for access to safe water supplies; passage of legislation assigning responsibility for providing water and sanitation services; development of institutions and improvement of their management; and success in obtaining funding needed to initiate and sustain service projects—both from external sources and from in-country mechanisms such as the revolving fund, which proved useful in assuring the continuity of programs. Even more importantly, by the end of that decade it was “generally recognized that a safe and adequate water system is the single most important measure that can be taken to prevent disease and at the same time to improve the standard of living of people.”*

The Decade of the 1970s

The new decade brought fresh commitments: the Ministers of Health of the Americas, at their III Special Meeting (1972), elaborated a Ten-Year Health Plan for the Americas which—among other program targets—set water and sanitation coverage goals of 80 per cent and 70 per cent of the urban population, respectively, and of 50 per cent of the rural population for both services.

An evaluation of that Plan was carried out in 1980. In those countries that supplied information for the purpose, some 70 per cent of the urban popula-

*Pan American Health Organization. *Community Water Supply and Sewage Disposal Programs in Latin American and Caribbean Countries*. Technical Series 5. Washington D.C., 1969.

tion had house connections; 40 per cent of the rural population had adequate water supplies; less than 50 per cent of the urban population had sewerage services; and less than 40 per cent of the rural population had adequate means of excreta disposal. More specifically, according to country data contained in sector studies carried out in 1978 and 1979 by the World Bank/World Health Organization/Pan American Health Organization Cooperative Program, of the 340 million inhabitants of Latin America and Caribbean, 160 million were supplied with water through house connections. About 90 million had access to sewerage or other sanitation facilities. In urban areas, many of those without house connections had some kind of access to water supplies, although usually intermittently and of questionable quality. The unserved rural dwellers obtained water from such places as shallow wells, springs, streams, and catchments, but it too was often of unreliable quality and at substantial distances; for waste disposal they depended largely on the fields.

The Challenge of the Decade

The regional goals for the Decade target providing access to drinking water supply services for approximately 100 million inhabitants in rural areas and 155 million in urban areas, and to sewerage or excreta disposal services for 140 million in rural areas and 250 million in urban areas by 1990; between 1991 and the year 2000 the goal is to extend and maintain coverage for 100 per cent of the population.

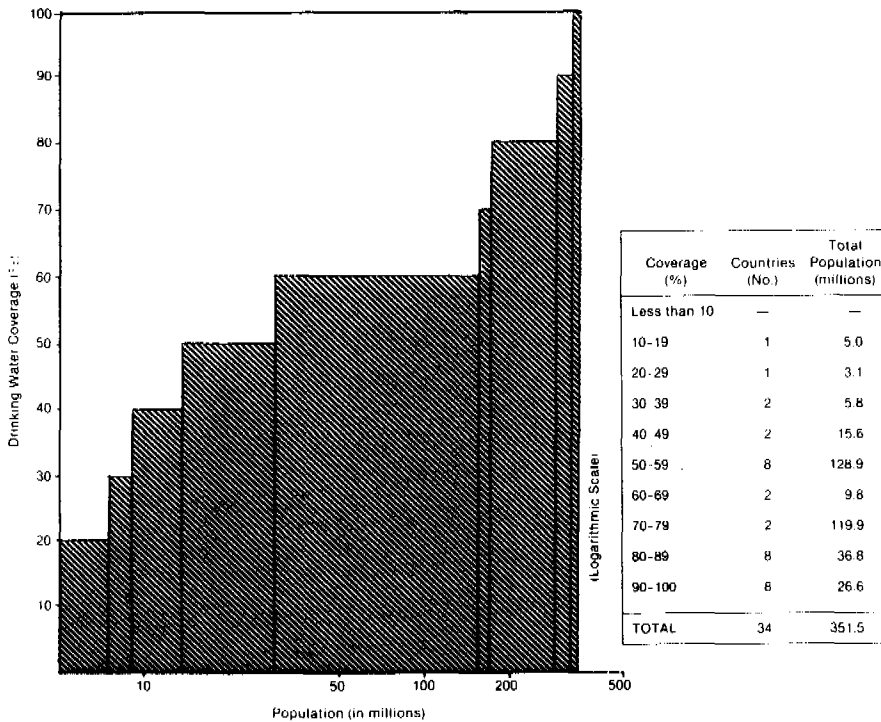
As part of the global Decade monitoring and evaluation process established by the World Health Organization to determine, among other things, progress toward accomplishment of Decade goals, the countries of Latin America and the Caribbean were asked in 1982 to provide information on their sector situation in the base year of 1980. Analysis of the data obtained from 21 countries, which together total 333 million inhabitants (approximately 95 per cent of the population of Latin America and the Caribbean) indicates the following:

- Of 218 million urban inhabitants in those 21 countries, 170 million (78 per cent) have access to drinking water through house connections or public sources at a distance of not more than 200 meters from their place of residence.
- Of 115 million inhabitants in rural areas (defined differently in each one of the countries, with limits of up to from 100 to 5,000 inhabitants) 48.7 million (42.2 per cent) have access to drinking water.
- Sewerage and sanitary excreta disposal services are available to 56.3 per cent of the urban and 11 per cent of the rural population.

At the country level, however, there are major differences in coverage. As an indication of those differences, countries have been grouped using the percentage of coverage in urban areas through house connections as the distinguishing indicator (since this indicator is the most reliable in that it represents 65 per cent of the total population studied, is generally registered in the consumer records of service institutions, and reflects the major results achieved). The tables that follow show coverage with drinking water services in urban, rural, and combined urban/rural areas, as well as with sewerage and excreta disposal services in urban areas for the 21 countries of Latin America and the Caribbean that were studied.

If to this information for 1980, other information dating from 1975 to 1979 is added on the situation in 13 countries in the Region, the resulting coverage with drinking water services would be 64.8 per cent or 228 million of a total of 352 million inhabitants during this period in Latin America and the Caribbean. The distribution of countries and respective population by percentage of coverage is shown in the following chart.

Percentage of coverage with drinking water services for urban and rural populations in Latin America and the Caribbean, 1980.



*Coverage with drinking water services in urban areas in Latin America and the Caribbean, by three groups of 21 countries in 1980.**

Group	No. of Countries	Urban Population (millions)		Coverage (%)		
		Total	Served	Total	House Connections	Easy Access
1	10	123.0	106.0	86.2	80.9	5.3
2	7	86.2	57.3	66.5	60.7	5.8
3	4	8.9	6.6	74.5	40.1	34.4
Total/Mean	21	218.1	169.9	78.0	71.3	6.7

*Countries were aggregated using as the distinguishing indicator the percentage of access in urban areas through house connections. Group 1 represents those countries with coverage ranging from 70 to 100 per cent; Group 2 represents countries with coverage ranging from 50 to 69 per cent; and Group 3 represents countries with coverage up to 50 per cent.

Coverage with drinking water services in rural areas in Latin America and the Caribbean, by three groups of 21 countries in 1980.

Group*	No. of countries	Rural Population (millions)		Coverage (%)
		Total	Served	
1	10	57.3	31.2	54.4
2	7	45.8	15.2	33.2
3	4	12.2	2.3	18.6
Total/Mean	21	115.3	48.7	42.2

*See footnote to preceding table.

Coverage with drinking water services in all areas—urban and rural—in Latin America and the Caribbean by three groups of 21 countries in 1980.

Group*	No. of Countries	Urban and Rural Population (millions)		Coverage (%)
		Total	Served	
1	10	180.3	137.2	76.1
2	7	132.0	72.5	54.9
3	4	21.1	8.9	42.2
Total/Mean	21	333.4	218.6	65.6

*See footnote to first table.

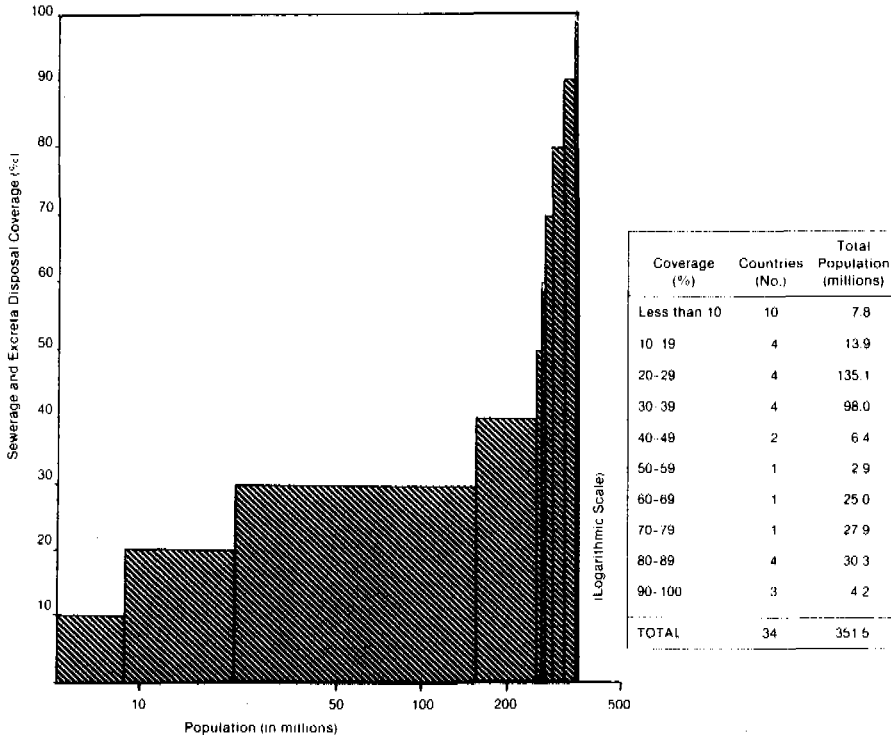
Coverage with sewerage and excreta disposal services in urban areas of 21 countries in Latin America and the Caribbean, by three groups, in 1980.

Group*	No. of Countries	Urban Population (millions)	Sewerage Connections		Septic Tanks/Latrines		Service (All Types)	
			Population (millions)	Coverage (%)	Population (millions)	Coverage (%)	Population (millions)	Coverage (%)
1	10	123.0	50.8	41.3	14.9	12.1	65.7	53.4
2	7	86.2	37.9	44.0	15.0	17.4	52.9	61.4
3	4	8.9	2.9	32.9	1.3	14.5	4.2	47.4
Total/mean	21	218.1	91.6	42.0	31.2	14.3	122.8	56.3

*See footnote to first table.

Sewerage and sanitary excreta disposal services have been extended to 122.8 million city dwellers (or 56.3 per cent) in the 21 countries studied by 1980. Sanitation services in rural areas have been provided to scarcely 12.7 million inhabitants (11 per cent of the population).

Percentage of coverage with sewerage and excreta disposal services in urban and rural areas in Latin America and the Caribbean, 1980.



In the course of the decade of the 1980s, new services will have to be provided to many millions presently unserved, and existing systems will have to be expanded to serve greater populations. At the same time, existing systems will have to be improved, properly operated, and maintained. The task ahead is larger in urban areas both for water supply and sanitation, as the urbanization trend is continuing to mushroom in Latin America and the Caribbean—three out of four people in the Region will live in cities of 20,000 or more inhabitants by the year 2000. Consequently, the magnitude of the challenge presented by the Decade is great.

Actually, when the first efforts to plan for the Decade were formulated, a number of the problems currently constraining socioeconomic develop-

ment had not reached the acute stage they have now. The double blow of worldwide inflation and recession have altered the courses of developing and developed countries alike. These conditions have retarded the massive investments in water supply and sanitation that were envisioned before the onset of the ten-year period. Profoundly affected by the global economic crisis, developing countries—many of which confront mounting debts—are demonstrating considerable caution in the financial investments and loan commitments they make.

Unbridled growth of the sector along traditional lines may not be possible. This does not mean, however, that the goals of extending water supplies and sanitation will have to be abandoned. The choice is not between having or not having access to services. What it does imply is a reevaluation—an adjustment of the means of extending those services. More effective and efficient use will have to be made of existing resources. For example, in many urban areas effective programs for reducing unaccounted-for water can result in savings ranging between 10 and 40 per cent. This allows service to an equivalent increase in population. Less sophisticated, lower-cost technology will have to be promoted for the time being, until the economic situation improves. Least-cost options that are appropriate to local conditions might mean installment of latrines and more public standpipes in some periurban areas instead of universal house connections and waterborne sewerage systems. Other needs include greater efficiency in resource allocation and optimization of system design and operation.

The Organization's Technical Cooperation with the Countries

If by 1990 water and sanitation services are to be provided universally, international organizations and national governments will have to generate radical, swift, and massive activity. The challenge is a major one, one that will only be met by the coordination of all national and multinational efforts.

An important aspect of the World Health Organization's general program of work has always been promotion of the provision of a clean water supply to populations—a goal which has now been broadened to include as many people as possible by the Decade's end. Four successive World Health Assemblies (from the Twenty-ninth of 1976 to the Thirty-second of 1979) urged:

- Development of national plans for and implementation of community water supply and excreta disposal services as part of overall socioeconomic development, giving priority to the least privileged in rural and urban-fringe areas.

- Appraisal of countries' community water supply, sanitation facilities and services, and their control.
- Mobilization of all possible resources for an accelerated effort to provide those facilities and services.
- Development of necessary organizational arrangements to facilitate pooling of resources and focusing of health needs by assuring effective, coordinated action of external agencies and relevant government bodies.

For the purposes of improving coordination at the country level and fostering regular consultation among governments, international agencies, and nongovernmental organizations involved in the Decade, a Steering Committee for Cooperative Action has been set up comprising representatives from collaborating agencies (United Nations, United Nations Development Program, United Nations Environment Program, United Nations Children's Fund, International Labor Organization, Food and Agricultural Organization, World Bank, United Nations Educational, Scientific and Cultural Organization, United Nations Center for Human Settlements, and WHO. WHO was chosen as the technical secretariat for this Committee and has created a special unit, the Global Promotion and Cooperation for Water Supply and Sanitation (GWS) Unit, to carry out this function.

The terms of reference of the Steering Committee are to review and develop policy, create a coordinated approach to the management of individual programs, and prepare for consultative meetings with representatives of governments, international agencies, and nongovernmental organizations in a position to offer technical and financial cooperation. In that context, it has identified and put into effect five major activities in support of the Decade:

- Studies of low-cost alternatives for water supply and sanitation, which are being conducted with the collaboration of UNDP and the World Bank;
- A system to provide information for potential donors on developing countries' plans and projects, and for the countries on donor aid availability and criteria;
- A clearinghouse function for the exchange and transfer of information on Decade activities (POETRI);
- Support activities for national Decade planning; and
- A public relations program to develop and maintain the momentum of Decade activities.

At the hemispheric level, the Pan American Health Organization, Regional Office for WHO in the Americas, at the XXVI Meeting of its Directing Council (1979), held Technical Discussions on "Strategies for Ex-

tending and Improving Potable Water Supply and Excreta Disposal Services during the Decade of the 1980s.” Those discussions resulted in adoption by the Council of Resolution XXII, which urged the Governments:

a) to include the extension of water supplies and sanitation services, particularly in the underserved rural and urban areas, among the priority programs for national development, and to promote intersectoral collaboration with other sector developments;

b) to give high priority to active community participation in decision-making, implementation, and operation and maintenance of water supply and sanitation projects, particularly in rural areas;

c) to adopt appropriate technologies compatible with their social, cultural, and economic conditions and explore the feasibility of promoting the local manufacture of supplies and equipment for water supply and sanitation facilities;

d) to support and seek additional funds for institutional development and training and continuing education of health personnel at all levels in order to improve the national absorptive capacity to utilize the funds to be invested; and

e) to explore new sources of financing for program development to supplement traditional mechanisms and external loans.

That same resolution requested the Director of the Organization to continue giving high priority to cooperating with Member Governments in strengthening their urban and rural water supply and sewerage programs including: i) the development of national, regional, and local strategies as well as institutions and low-cost simplified technology; ii) the full utilization of the resources of the Organization, particularly those at the Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS), for the training of personnel at all levels and the dissemination to Governments of information on the availability of such activities; iii) the establishment of systems for the exchange of information; iv) the identification and preparation of project proposals; and v) the seeking of extra-budgetary resources to further the collaboration with Governments in implementing their programs.

In support of the Decade, PAHO aims to cooperate with the countries in coordinating sector activities at the national level. That cooperation includes upgrading the efficiency and effectiveness of agencies' management and operations, increasing internal financial allocations for those activities, formulating and conducting projects, assigning priority to ser-

vices for the urban and rural poor, encouraging community participation and technical cooperation among developing countries, and effectively utilizing resources through exchange and dissemination of information regarding programs and resources. At the same time, the Organization promotes the provision of greater technical support and increased external funding through bilateral and international technical and financial cooperation agencies.

Action for the improvement of water supply and sanitation must be complementary to, and combined with, health measures and education, and should be closely related to programs in other sectors. The aim should be achievement of full coverage by replicable, self-reliant, and self-sustaining programs, which would imply a broad-based approach with community involvement playing an important role in all stages of the program.

It must be remembered, however, that the Decade is not the creation or the undertaking of the United Nations or of the World Health and Pan American Health Organizations: the contributions of PAHO and WHO represent only part of the international effort, which in turn makes up only a modest part of the total Decade effort. The largest contribution will have to be made by individual governments. The success of the Decade will depend on the belief of those governments in its aims and their willingness to obtain funding and other resources in times of economic restraint. The role of the international system in support of those efforts is one of stimulating awareness and interest and of catalyzing action.

Now that Governments have subscribed to the goals of the Decade, the resources for their attainment—human, technical, institutional, and financial—have to be identified and developed. It will be necessary to assign priority to the extension of water supplies and sanitation services in national development planning, to emphasize community participation in service projects, to adopt appropriate technologies and employ local supplies and equipment for the respective facilities, to further human resource and institutional development, and to explore innovative financing methods and services for program development. This publication explores these areas in depth in the chapters that follow.

Chapter II

Planning

The development of national plans and programs for community water supply and sanitation was a key recommendation of the Plan of Action of the United Nations Water Conference (Mar del Plata, 1977). Subsequently, the countries of the Americas have targeted the establishment of goals for 1990 which match, as far as possible, the global goals adopted for the Decade.

Planning of the water supply and sanitation sector is not new to this Region, where there has in fact been vast experience in the field. In the past, however, planning involved much more limited action than that called for by the Decade and far fewer restrictions than those imposed by this ambitious worldwide program, which aims for full coverage and gives priority to less-privileged population groups. Moreover, planning for the Decade will have to take into account that much more has to be achieved with the limited financial resources available, and this will necessitate the application of innovative concepts and practices not heretofore used.

Improvement of peoples' health and well-being is the major justification for the Decade. Such improvement will not come about merely by building more water supply and sanitation systems, especially if they are built to meet traditional economic and financial criteria. Indeed, the Decade cannot succeed if the same technology and the same management approaches are applied as have been in the past. For this reason, the World Health Organization has recommended that countries observe certain fundamental principles in carrying out their water supply and sanitation programs. Those principles, listed below, transcend the sphere of sectoral policies and are germane to any consideration of development and financing for the Decade.

- Complementarity between drinking water supply and sanitary disposal of excreta, including sanitary education as a means of achieving a significant impact on health;
- Focusing of the Decade on the underserved population—both urban and rural—to ensure that the efforts made during the Decade have genuine social

significance. The United Nations Water Conference emphasized that priority should be given to the “poor and less privileged” population, most of whom live in rural and urban-fringe areas;

- Achievement of full coverage through replicable, self-reliant, and self-sustaining programs, designed to promote maximum use of local capabilities and to achieve financial and operational independence;
- Social relevance and use of technologies that ensure that the facilities and services of the water supply and sanitation systems to be installed are consonant with the customs and traditions of the beneficiary population, so that the users can assume a large share of the task of operating and maintaining those facilities;
- Association of the community with all stages of programs and projects to ensure that they are commensurate not only with its needs but also with its demands, and with the development of a sense of ownership;
- Close relation of water supply and sanitation programs with development programs in other sectors in order to take advantage of the opportunities and economies of scale offered by multipurpose projects; and
- Association with other health programs so that water and sanitation become an integral part of primary health care, paving the way toward the goal of “health for all by the year 2000.”

The foregoing principles clearly suggest that, in addressing efforts toward achievement of the objectives of the Decade, the countries will find it necessary to strengthen or reorganize institutions in the sector; to provide them with the necessary human, physical, and financial resources; to heighten their managerial talents; and to actively involve communities in the process in order to accelerate the creation of these services and ensure that they are utilized, operated, and maintained as efficiently as possible. The best way to meet these needs, indisputably, is to review existing sector plans and reorient the national planning process. The Decade itself should provide a stimulus and an opportunity to reconsider the direction of national policies and to plan water supply and sanitation services in the context of overall socioeconomic development.

Prior to the Decade, sector planning in the countries of the Region was characterized by: national strategies that gave priority attention to urban and more affluent groups even though, during the 1960s and 1970s, increased attention was provided to rural populations especially those living in larger communities; planning at the institutional level rather than in response to overall national needs of the sector, frequently resulting in insufficient attention to large groups of people most in need; weak information systems for planning and management; and generally nonexistent procedures for evaluation and monitoring of sector performance. Many of these pre-Decade characteristics continue to prevail.

At the same time, traditional planning of the sector has been conducted in an isolated manner, that is, it has not been coordinated with other developmental sectors—a situation which has robbed the sector of efficiency, breadth of action, logistical support, and additional financial resources. Moreover, national planning has been geared mainly to meeting the budgetary demands of the central administration rather than focusing on long- and medium-term trends and needs. Also, planning has frequently been approached as a task, as an end in itself, rather than as an element of management, a continuous process essential to decision-taking and optimum utilization of available resources.

Decade Plans

In planning for the Decade, it is urgent that the Governments of the Americas consider the provision of water supply and sanitation services a priority activity, requiring policy decisions at the highest level.

National planning should conform to the situation and needs of the particular country, set medium- and long-term goals, specify strategies to achieve those goals, define overall program requirements, identify necessary means and resources, outline the institutional arrangements and the infrastructure required, determine the cost and financial implications, set schedules, and assign responsibilities to the executing agencies. Planning should also consider the importance of conducting applied research—i.e., those studies identified as necessary to meet particular sectoral needs. In addition, provision should be made for the monitoring and evaluation of sector development to measure the progress made, identify restrictions, and make timely adjustments and projections so that the planning process can continue.

It is essential that planning for water supply and sanitation project beyond the traditional confines of the sector. On the one hand, such planning should be coordinated with other sectors, which will involve interaction with ministries of planning, public health, public works, education, agriculture, and finance. On the other, it should involve communities in all stages of sector development. Many people in the countries may not be aware of basic hygiene and health considerations; consequently they may not demand, and are less motivated to participate in, the construction of basic facilities. The primary health care strategy targets the extension of water supply and sanitation programs to all. This will require an emphasis on self-help and health education programs, as well as the adoption of water tariff policies that assure that poorer groups of the population receive services.

Successful planning will require supportive legislation and should fit into the national framework for overall socioeconomic development. The Decade plan should be incorporated in the formal plans of governments in accordance with national planning cycles. At the same time, planning will have to assert the justification for increased spending for water and sanitation measures as compared to that of the past.

In essence, then, a national plan for the Decade would be a most useful vehicle for certain important functions, namely:

1. As a statement of reoriented approaches and other strategies for program development and implementation, it would guide all those working for the Decade in the country. The plan would set long-term goals with respect to coverage and would support programs to remove the constraints to rapid coverage.

2. As a statement of aims, the plan would mobilize opinion. Its ability to meet a demand for services will depend greatly on the extent to which it influences community attitudes.

3. The plan would set out the agreed policy, mechanisms, and administrative arrangements, determine the sectoral and intersectoral tasks for the programs that it will regulate, specify the allocation of resources and the institutional arrangement, and establish a timetable for implementation.

4. The plan would provide a realistic estimate of the cost of Decade activities to the country, in terms of national and local public resources, and state the case on social and economic grounds for devoting more resources than in the past to water supply and sanitation. It would reassure the national financial administrators that the choice of technology and design criteria and the mobilization of community resources and external contributions would be matched with the national funding requirements.

5. Once these functions have been assured, the plan would also be a means, as other development plans have been, to approach funding and donor agencies for support of Decade programs.

Programs

The distinction between plans and programs is important. Plans have been described in a general fashion above. National programs are those sets of projects and activities deemed most practical and feasible in a given country to carry out the plan. They:

- Set specific targets for a determined period;
- Identify priority projects or activities and establish schedules for their implementation on a year-by-year basis;
- Specify institutional arrangements and allocate responsibilities, including those for planning and implementation of programs and for operation and maintenance;

- Establish staffing and logistics;
- Provide budget and funding mechanisms.

Coverage Programs. A distinction should be made between coverage programs and support programs. Coverage programs, or what in effect are investment programs, seek directly to extend services and, depending on the characteristics of the country and the considerations of the plan, could be designed to cover:

- Urban areas (by segments of population if necessary).
- Urban-fringe areas—squatter settlements, slums, etc.
- Rural areas with concentrated populations (by segments of population if necessary).
- Rural areas with dispersed populations.

Since the Decade has assigned priority attention to rural areas, programs in these areas should incorporate technology appropriate to the local situation so as to make systems easier to operate, maintain, extend, and repair. Also, in designing the programs, opportunities should be sought for encouraging local communities and the lowest administrative levels of agencies to assume greater responsibility, as appropriate.

Most of the countries of the Region are developing important rural water supply programs and some positive efforts have been made in this regard; nevertheless, planning for the Decade will have to pay particular attention to those problems that remain unsolved, especially as activity in these areas is to be stepped up. In the case of concentrated rural communities, the management of systems being operated and maintained by the community will have to be improved, by training and supporting people so that they can better carry out their responsibilities. Operation and maintenance requires effective and continuous support from the national agency responsible for the program. Central ordering, storage, and distribution services for materials and spare parts should be strengthened and replacement and repair facilities developed. Support services may be more effective if provided from the provincial rather than the central level because of easy access, knowledge of local needs, and acceptance by the community.

Programming should take into account the financial requirements of rural services. To continue with high rates of subsidy would slow down the extension of self-sustaining and -proliferating programs and multiply the broad-front strategy.

It is likewise important that programming consider the disposal of excreta and wastewater so that these services can be developed along with

the water supply program, latrine programs, and individual wastewater disposal systems. National water supply agencies should assure responsibility for this area of the program and should provide the necessary coordination and support with specialized agencies within the Ministry of Health.

Water supply and sanitation programs in areas with dispersed populations may be carried out by the Ministry of Health as part of the primary health care strategy. If so, appropriate technologies, community participation, and community health education will, among other elements, be essential.

Urban areas where the low-income population resides—both ghettos and outlying areas—are usually underserved and lack easy access to water supplies and excreta disposal facilities. Consequently, the design of programs for these areas, which constitute another objective of the Decade, will also require special consideration. Experience in dealing with these problems is more limited and may necessitate a special arrangement within the agency responsible for water supply and sewerage to ensure that these improvements are coordinated with other improvement programs for the urban-fringe, such as housing programs. Appropriate standards of service and technology need to be selected, and the community should also participate. Urban-fringe programs can provide assistance and promote action through public and semi-public entities, non-governmental organizations, and health and community welfare agencies. Policies to subsidize the urban-fringe from more affluent parts of the city should be considered during the planning of the program.

Programs for drinking water supply in urban areas will demand the largest investments in terms of expansion and improvement. Sanitation in urban areas needs to be expanded at even greater rates if by 1990 the gap between water supply and sanitation services is to be significantly reduced. In water supply, the levels of unaccounted-for water (sometimes on the order of 50 per cent of the water produced) will have to be reduced. This calls for improved operation and maintenance, leak detection, control of illegal connections, improvement in consumer registration and billing, and adoption of realistic water tariffs. Least-cost technologies responsive to actual situations will have to be adopted or developed for both water supply and sanitation.

Support Programs. Support programs are designed mainly to reduce constraints and to strengthen the sector so that it can perform efficiently. Such programs may be needed in specific areas, to be defined in particular

cases, with each country having to determine needs and content depending on the support required by the sector and investment programs. Support programs will include the following:

- Development of institutions and human resources
 - Subprograms:
 - Operations
 - Projects and works
 - Operation and maintenance
 - Commercial system
 - Administration and development of human resources
 - Support administration
- Community participation
- Communication and health education
- Water quality monitoring and surveillance
- Technology and information research
- Development of water resources, particularly underground water.

Planning and program considerations of some of these areas are provided in the corresponding sections of this document.

Projects

Programs, especially investment programs, are carried out in the form of projects. Programs should identify and prioritize projects, after which project preparation and implementation can be carried out. These stages will include:

- A pre-investment study, consisting of the consideration of alternatives and the establishment of technical, financial, and managerial or operational feasibility, taking into account the optimal use of resources needed to match or stage the project in accordance with the capacity of the system;
- Design;
- Ensurance of the availability of capital and labor for construction, management, operation, and servicing;
- Funding to meet initial and recurrent costs;
- Construction;
- Operation and maintenance; and
- Monitoring and evaluation.

Planning Seminars and National Workshops

A national seminar or workshop can provide an opportunity to stimulate the discussion of policies and strategies among the authorities and rep-

representatives of the ministries, agencies, and institutions responsible for sector work. Such discussion would serve to review and assess options, determine responsibilities, introduce policy orientations, involve the mass media, consider the reallocation of priorities between sectors and within the water supply and sanitation sector, and agree on sector plan elements. The workshop could result in proposals and recommendations for governmental action.

Decade Planning in Latin American and Caribbean Countries

The Pan American Health Organization has been promoting and collaborating with interested governments in the formulation of national Decade plans. As part of this effort, an interregional project aimed at planning for the Decade is being carried out in the Americas through an agreement between the World Health Organization and the Federal Republic of Germany's Technical Cooperation Agency (Gesellschaft fuer Technische Zusammenarbeit or GTZ). The project aims to provide support for national planning including: the determination of national goals; the identification of priority investment programs and projects; and the formulation of support programs such as institutional organization and development, training and development of human resources, community participation, operation and maintenance of water supply and sanitation services, appropriate technology, and information services.

The WHO/GTZ cooperative project began in 1980 and included Haiti, Bolivia, and Paraguay; in 1982 Honduras was added. PAHO and each of those governments signed a two-year agreement, during which time cooperation would target the preparation of the plan and the national sectoral planning process would begin. To coordinate action for the Decade, each of the governments created an interagency committee, which assumed responsibility for planning. PAHO provided technical collaboration, including specialized consulting services and support in the development of planning workshops.

The project came to a close at the end of 1982 in the first three countries and concluded in Honduras in the first half of 1983. It has permitted the design and application of an innovative planning methodology, which is also being utilized in Ecuador, El Salvador, and Guatemala. National plans were to be prepared for the first two of those countries by mid-1983.

That methodology, which serves as an orientation for planning of the water supply and sanitation sector, consists of the following elements:

- Integral national planning of the sector is seen as a continuing managerial process subject to revisions and adjustments, oriented to the rational use of resources for the attainment of the goals of the Decade.

- Planning is carried out under the aegis of a high-level coordinating body, the National Action Committee (NAC) for the Decade, which includes the Ministries of Planning, Public Health, Public Works, Housing, and others.
- The Committee is served by a Technical Secretariat (TS) that consists of a basic team of national professionals—sanitary engineers, financial analysts, and economists—with experience in planning and of work teams of experts in specialized fields. In practical terms, the TS could include professionals assigned by national units involved in the water and sanitation sector. The TS carries out the work of planning, principally using information available in the country rather than prompting studies and surveys that demand a lot of time or money. Its staff serves as national counterparts to any external technical cooperation that the project might require.
- Planning is carried out using a plan of operations prepared in advance and in which consideration is given to study and analysis of specific areas pertinent to diagnosis of the situation and determination of the needs. These studies are realized by TS personnel with the assistance of national specialists from the work teams. Where external technical cooperation is available, international consultants would join the teams.
- The basic team reviews the prevailing situation of the sector and its historical development in the country, including the achievements of coverage extension programs and subprograms, the development of both national and external investments, and the resultant gains made. It also analyzes the policies and strategies of the sector and determines the major constraints to sectoral growth. With this information, the basic team proposes a general framework for Decade planning with recommended policies, realistic national goals, strategies, programs, and priority projects. It also determines the overall investments necessary and suggests basic financial policies and strategies for the plan.
- Using the plan of operations and the framework for sector planning proposed by the basic team as guides, the work teams carry out studies in specific areas. One team might review the institutional scheme set up in the country for administration of the sector and would formulate proposals for its reorganization, strengthening, and development in accordance with the needs and goals foreseen. Other teams might study, for example, human resources, appropriate technology, community participation, water quality, information systems, and similar areas specified in the plan of operations. As a result of their efforts, the work teams make proposals for consideration and inclusion in the plan.
- On completion of these tasks, the basic team analyzes and reviews the proposals formulated by the work teams, makes the necessary adjustments in the original framework for sector planning, and prepares a draft of the sectoral plan following a guideline especially designed for that purpose (see Annex I).
- Since this planning is carried out within the broadest possible participatory context, the methodology also considers the development of two planning

workshops. The first workshop is held at the outset of the planning exercise for the purpose of providing general orientation regarding the sector situation, the Decade proposals, and the need for integral planning at the national level. The second workshop, at the end of the planning exercise, aims to inform as to the results of the planning and review the draft sectoral plan so that suggestions can be made to improve it and the necessary professional and political support can be obtained. Both workshops are attended by representatives of the main ministries, agencies, and offices involved in development of water supply and sanitation services at the national, regional, and local level. Other participants include representatives of professional agencies, higher education, the private sector, and international and bilateral technical cooperation and funding agencies involved in the sector.

- The results are considered by the National Action Committee, which prepares, through the Technical Secretariat, the final document of the Decade Plan and forwards it to the respective levels of government for formal adoption. As the result of a special decree or similar mechanism, the "National Decade Plan," thus approved, attains legal validity.
- The Committee should also take responsibility for overseeing the execution of the plan. To do so, the Technical Secretariat develops the necessary programming following the determined order of priorities to carry out investment and support programs as well as other necessary actions.
- In order to obtain external support, the Committee maintains contact with the Technical Support Group made up of representatives from external agencies working in the country, which is coordinated by the Resident Representative of the United Nations Development Program, thereby initiating technical and financial cooperation activities. A consultative meeting with funding and donor agencies to present the plan and stimulate support for it is encouraged.
- The Committee would also develop a process to evaluate and monitor execution of the plan.

Chapter III

Community Participation

The involvement of people in their own development, a phenomenon commonly referred to as “community participation,” is not new to Latin America and the Caribbean, where there are over two decades of experience in community participation programs for rural water supply and sanitation. This strategy has usually been considered to require promotion by outside groups. In some areas, however—notably the Andean countries—advantage has been taken of the indigenous tradition of community cooperation for the building of rural water supply services.

Community participation can mean different things in different countries and even within the same country, depending on a number of factors. It can involve project execution or decision-making. It can be sponsored by the government or nongovernmental organizations. It can aim at maintaining social stability or transforming the social system. How it develops will depend largely on the nature of the community itself—i.e., whether it is highly homogeneous or stratified. Likewise, its success will be dependent on the political structure: a change in the general political orientation will affect the policy regarding community participation. This can have negative implications: a community will hesitate to respond when its members feel themselves being manipulated by the governmental bureaucracy for primarily political purposes; major failures can thus result and thwart true involvement of the community.

Community participation will differ, also, depending on the sociocultural context: in countries where there is an Incan, Mayan or Aztec tradition (e.g., Bolivia, Peru, Ecuador, Colombia, Guatemala, Honduras, and Mexico), individuals will be more involved, the community more accustomed to working together, and local committees more active. Elsewhere, the promotion of participation will develop differently.

Community Participation in Water Supply and Sanitation

To facilitate an analysis of community participation in drinking water supply and sanitation services in Latin America and the Caribbean, the

table on page 27 relates the activities that are required in the different areas and components of those services with population groups in the Region. It demonstrates the relationship on the one hand, of promotion through different approach strategies of community participation in planning and construction, operation and maintenance, administration and financing, and sanitary use of water supply, sanitation services, and general hygiene with, on the other, urban and rural population groups, according to their location and health risk. Groups in those two sectors are further described below:

Urban sector

- Population group of users from single family or multifamily housing with service mainly through house connections to water supply and sanitation services.
- Population group living in slums in the inner city and having limited collective sanitary services for a large number of people.
- Population group in urban-fringe areas covered only very partially with water supply and sanitation services.

Rural sector

- Population group living in rural clusters (how countries distinguish this group numerically from the urban population varies, with different ceilings of from 100 to 5,000 inhabitants).
- Population group living in dispersed rural areas.

The matrix in the table makes possible the rapid evaluation that follows of the community participation phenomenon as it has been carried out to date in Latin America and, at the same time, serves as a reference point for activities that should be undertaken in the future—and particularly during the Decade—to assure broader participation of the community in water supply and basic sanitation programs.




Community Participation in the Urban Sector

There has to date been only very limited community participation in the cities of Latin America. Health, housing, and municipal agencies, national organizations, and water supply and sanitation companies have done little or nothing to promote it. Each of the systems responsible for delivery of services to the urban population should take into account the importance of involving the community in the various phases of service, bearing in mind that that involvement may be different in every case.

Planning and construction are aspects in which urban dwellers have been

TABLE I. Community Participation in Drinking Water Supply and Sanitation Services to Date in Latin America

Population Groups (with different health risks)		Community Participation						
		Planning and Construction		Operation and Maintenance		Administration and Financing		Sanitary Use and Health Education
		Drinking Water	Sanitation	Drinking Water	Sanitation	Drinking Water	Sanitation	Drinking Water and Sanitation
URBAN	Users with house service							
	Slums							
	Urban-fringe	Very Weak Community Participation						
RURAL	Clustered	Intense Community Participation	Very Weak Community Participation	Very Weak Community Participation		Very Weak Community Participation	Very Weak Community Participation	
	Dispersed		Very Weak Community Participation					

-  Intense Community Participation
-  Very Weak Community Participation
-  No Community Participation

rarely involved. The table on page 27 does not apply to participation in water supply services by users with house connections but it does to sanitation, since the community has never been consulted in the planning stage about different aspects such as the change of their type of service, the location of wastewater treatment plants, or the placement of rainwater collectors. For its part, the slum community, which is highly exposed to health risks, has never been consulted with regard to the possibility of improving their water supply and sanitation services. Some of the countries of the Region have recently begun to seek participation of the community in urban-fringe areas in the digging of ditches for the installation of water supply pipes, but these represent mostly isolated, small-scale demonstration projects.

There has been no participation by communities in any one of the three urban population groups in the *operation and maintenance* of water supply and sanitation services. Frequently, sewage collectors and storm drains get clogged with solid wastes; manhole covers and water meter boxes disappear or are broken; public drinking water faucets are stolen in urban-fringe areas; and fireplugs are broken and vandalized. These and other occurrences point to the fact that the urban community fails to identify with its service and therefore does not consider it important to monitor its operation and maintenance.

Community participation in the *administration and financing* of urban services continues to be very weak, although PAHO and other agencies have stressed the importance of this aspect. The urban community does not understand what the costs of services are, why tariffs need to be paid, the importance of water metering, the amount of water that is wasted domestically, the need to pay for services on time, the damage done by clandestine connections to service administration, the importance of assuring the honesty of service personnel, or the possibility of financing the extension of services to slum and urban-fringe areas. And because the community does not understand these things, it fails to participate in and facilitate the administration and financing of water supply and sanitation services. In some of the countries, the sanitation agency boards include a delegate from the users or neighborhood committees, but he or she is usually appointed by the national or local government and consequently is not a true representative of the community.

Community participation has not been systematically promoted for *health education and rational, sanitary use of water supply and sanitation services*. Only on occasion and in emergencies do the respective health and water and sanitation agency authorities make recommendations, and these usu-

ally go unheeded by the community. Frequent results include: ignorance of the relationship between health and drinking water and proper excreta disposal; waste and loss of water within the home; unprotected water storage tanks; defective inside sanitary facilities and possible crossed connections; overwatering of gardens; unmaintained sanitary services, installation of private swimming pools without water recirculation; subterfuge to avoid water metering; and other problems too numerous to mention but which denote a lack of community participation.

In short, the 228 million inhabitants of Latin American cities, 78 per cent of which have water supplies and 56.3 per cent sanitation services, still do not participate in the basic sanitation process of their communities.

Community Participation in the Rural Sector

The Clustered Rural Population

This population resides in communities that range from a minimum of 50 to 200 inhabitants, to a maximum, depending on the country, of between 1,000 and 5,000 inhabitants. Approximately one-fourth of the population of Latin America lives in these rural clusters; 42.2 per cent of them have water services through house connections and easy access, while only 11 per cent have excreta disposal systems.

It is in this population group where the most gains have been made in community participation, although they have been largely limited to drinking water system *construction*. As a result of these efforts, dating from the 1950s and in which PAHO has collaborated through its programs in the countries, water supplies have—as indicated above—been extended to roughly half of this population. The organized rural community participated in all the phases of the planning and construction process: identification of its drinking water needs, search for supply sources, conduct of field studies, setting up of committees to organize the community contribution, and construction. Communities have contributed 20-30 per cent of the total project investment. Basically this contribution comes in the form of unskilled labor, which represents 50-70 per cent of the total cost of labor, depending on whether a pump or gravity system is used; local materials (gravel, sand, stones) that do not represent more than 2 per cent of the total project cost; and money, the amount of which varies depending on the socioeconomic condition of the communities.

In *operation and maintenance* and in the *administration and financing* of drinking water services, efforts have been made to promote in various ways the

participation of clustered rural communities. The results have been poor, however, with the exception of a few countries. Evaluations that have been carried out show that many of the service components do not work; that there is no maintenance; that administrative boards—set up with such expectations—function only partially; that tariff collection is low; and that there is a lack of basic financial and administrative information. The reasons for these shortcomings are varied, but possibly the major one is lack of guidance and follow-up of the work of the local administrative boards by official agencies in charge of rural drinking water. Such agencies often manage to successfully organize the community into administrative boards, but go no further—often because no resources are forthcoming from the central government. Community participation in these areas therefore needs to be reoriented and strengthened in a number of countries.

The *rational, sanitary use* of rural water supply services by the community has barely evolved at all, since health education is a neglected area—instructional tools and audiovisual aids being used only sporadically in a few countries and with insignificant results.

Community participation has only played a partial role in the provision of rural sanitation services and has therefore not given the expected results, although rural latrine programs are even older than water supply programs. As far back as 1913 when the Rockefeller Foundation began operations in the Americas, the improvement of public water supplies and sanitation, with participation of the community, received attention. Later, the Cooperative Services supported by the United States Government targeted rural area development that included small water supply systems and sanitation facilities. The construction of latrines proved relatively easy; however, after many of them were installed they were neither used nor maintained. In fact, it is more than likely that many of the communities never really understood the purpose of these facilities.

Consequently, in the clustered rural sector—with the exception of drinking water system planning and construction, which as shown in the table represents only one part of the process—the community only participated slightly in most of the countries in the rest of the activities requisite to the supply of drinking water and sanitation services.

Nevertheless, it is important to stress that Latin America has initiated the process and led the rest of the world in organizing community participation in the planning and construction of drinking water services in the clustered rural sector. The Pan American Health Organization has cooperated directly with the countries of the Region in support of their efforts in this regard.

Examples of rural community participation in three of the countries of the hemisphere follow.

Colombia. The National Rural Basic Sanitation Program (Programa Nacional de Saneamiento Básico Rural) in Colombia, established in 1964 under the National Institute of Health, includes four subprograms: water supply, sanitation (a latrine-building program for the dispersed population), waste disposal, and school supplies. It also has a community promotion section that is making great strides, through its mobile audiovisual units, in motivating people to play a conscious, active, and sustained role in their own development.

The program is concerned mainly with providing drinking water and proper excreta disposal services to villages with fewer than 2,500 inhabitants. To achieve this, the community contributes 20 per cent of the total cost of the sanitary facilities, reimburses about 40 per cent of the investment made by the government, and is responsible for administration, operation, maintenance, and extension of the facilities. Health education aims at ensuring that the community understand its role as both the beneficiary and the agent of health care.

The success of the program is attributed to the utilization of motivated, effective human resources; the availability of technical and logistical means (motor vehicles and audiovisual apparatus), and the planning of activities (four operational areas have been subdivided into six sections, each of which has about six global promoters of rural basic sanitation).

Dominican Republic. The National Rural Water Supply Plan (Plan Nacional de Agua Potable Rural or PLANAR) was initiated in 1964 by the National Potable Water and Sewerage Institute (Instituto Nacional de Agua Potable y Alcantarillados or INAPA). The goal of PLANAR was to cover 600,000 people living in 650 villages (with populations between 300 and 5,000) by 1985 and to do so by relying heavily on participation of the population in the program.

One of the first steps in the program was identification of potential communities to be served: 2,803 villages had a population between 300 and 5,000. INAPA listed and located all these villages, and surveys were carried out by INAPA brigades to determine: accessibility to the village, concentration of houses, availability of satisfactory water sources, availability of electricity, communication facilities, and availability of construction materials.

Out of the 2,803 villages, PLANAR selected 650 on the basis of sanitary and socioeconomic conditions (supply need, condition of existing service,

community participation willingness), which it in turn divided into four groups for a four-phased program. Four operational areas were set up, according to distribution of the population and national features. In each one, an area office was created. The promoters were high-school graduates with rural life experience; they had one week of pre-training at the central office of INAPA and three months of in-service training working out of the area offices with experienced promoters.

A number of factors contributed to the success of this program, including: training at all levels—engineers, administrators, technicians, promoters, water committee members, and local operators; operational decentralization, good coordination, careful scheduling of all phases—for instance, detailed designs were prepared long before they were needed, materials were ordered in advance, and organization of local water committees was scheduled on time; selection of the villages in each phase, in order to make inspection during construction easier, and grouping of adjacent villages into a multiple system with a common source; design of low-cost systems and standardized details; and strong support of the national government.

Peru. The bases for community participation in the supply of drinking water to the clustered rural population of Peru were conceived in 1958 in the Junín Plan, a tripartite program of PAHO, UNICEF, and the Ministry of Health. The original Plan resulted in the provision of drinking water to more than 20 localities. In 1964 it was transformed into the National Rural Drinking Water Plan, under the Ministry of Health, and received the first loan that the Inter-American Development Bank granted in the Americas, for rural drinking water. Since then drinking water systems have been executed for approximately 1,200 rural localities of less than 2,000 inhabitants, benefitting some 1.2 million people, at an investment of almost US\$40 million.

Four consecutive loans from the IDB for more than US\$10 million served as an endorsement of the successful progress of the Plan, allowing for a joint financing by contributions from the Peruvian Government, the beneficiary communities, and others such as UNICEF, of a program that achieved community participation (with a contribution of 25 per cent of the total financing) in the construction of more than 1,000 drinking water systems. In this Plan, the sine qua non condition has been community participation, a support activity involving ongoing dialog from the moment the need for a drinking water system is identified in the rural locality until the construction stage during which the community delivers its con-

tribution—usually consisting of unskilled labor, local materials, land, use of warehouses, granting of rights of way, and money.

Factors leading to the successful construction of rural drinking water systems through this Plan were: existing organization of the rural communities in Peru; natural inclination of the rural population to cooperate in projects that include water as a component; the solidarity and participation that are customary in rural Peruvian communities and that facilitate the construction of drinking water systems; the technological approach to design and construction on the part of the executing agency, adapting it to local conditions and thus allowing for lower costs and greater community contribution; use of the installed capacity of the Ministry of Health assigned throughout the country, given the fact that the Plan is based primarily on educational efforts and community promotion, for which staff of the Ministry are prepared; and governmental support and decision to carry out the Plan.

Obstacles and limitations of this Plan have been: the rural communities' limited understanding of water and its relation to health, which makes the health education task harder and the operation and maintenance of services more difficult; the executing agency's lack of operating resources to cover the costs of supervision and advisory services for drinking water systems that had been built; the relatively unchanged economic income of the rural population over the last decade; and the inflationary process, which has resulted in high project costs and which will have an impact on new approaches to community participation—making it necessary, for instance, that all promoters come from the community itself and that the Ministry of Health train them to become change agents.

The Dispersed Rural Population

In Latin America this population group, which is supposed to exceed 50 million inhabitants (although no reliable data are available) has no access to drinking water or sanitation services (the few farms, ranches, and country houses that do have these services do not represent a significant statistical value). The term “dispersed” includes groups of rural dwellings of up to 10–20 families and actually dispersed dwellings.

While, generally speaking, this entire population uses water from some source—either close to or far from where it resides—the quality of that water can not be considered safe for human consumption and therefore for people's health.

It is difficult for this population to be organized as a community. As

a result, its members' participation is more familial or individual than communal.

In respect to the provision of drinking water, this dispersed population remains forgotten. As regards sanitation, there have been various attempts in some of the countries to provide services in the form of latrines, toilet bowls, and other means. The results are still limited, but it is encouraging to consider that, given the major emphasis on health education of the primary health care approach, this group may become more involved in the future.

Community Participation and the Decade Approach

One of the major elements of the Organization's Decade approach is "association of the community with all stages of programs and projects." The main activities concerned in that association are: promotion of personal and community hygiene, provision of safe drinking water supply, provision of excreta disposal, protection of water sources and surveillance of drinking water quality, and linkage with other sectors.

PAHO activity in the field of drinking water and sanitation targets the formulation of guidelines for community participation and education, and the evaluation and formulation of guidelines for the establishment of operational linkages with primary health care so that these activities are mutually supported.

In addition, in the urban and rural sector the Organization will continue to promote and cooperate in the formulation of guidelines and models for community participation in the institutional development program in which PAHO is collaborating.

The development of water supply and sanitation can serve as an entry point for the introduction of other primary health care elements into the community, in that it lays a groundwork founded on community-based worker training, promotion of village health committees, health education, and public information.

Chapter IV

Appropriate Technology

In the years to come, the context for development in each of the countries of Latin America and the Caribbean will be one of fierce competition for increasingly scarce economic resources. As a result, it is becoming exceedingly important to search for and develop more effective and less expensive ways of providing water and sanitation facilities and to focus on efforts that assure the greatest return on investment. For this to be possible, the technology employed must be appropriate for the situation in which it is to be applied. An appropriate technology has been defined as a method or technique that provides a socially and environmentally acceptable level of service or quality of product at the least economic cost.

Appropriate technology—whether it be viewed from the narrow standpoint as a device or from the broad viewpoint as “know-how”—is a cornerstone for the improvement of water supplies. To qualify as appropriate, a technology must fall within the capability of the users to obtain, utilize, and maintain. Ideally its use will also result in or at least encourage further improvements and modifications to render the technology more applicable and sow the seeds for additional technical innovation and adaptation.

Appropriate technology consists of hardware plus adequate support in a situation in which the purpose of the hardware and the objective of the users are consonant. Developing countries are keenly aware of the tremendous advantage that technology gives the developed, industrialized countries. Because the indigenous capacity of most developing countries to devise, innovate, adapt, or even select a technology is limited, they often tend to depend upon technologically advanced countries to direct technologies toward solution of their problems. In their eagerness to obtain these tools to increase productivity, income, well-being and the like, they often overlook or underestimate the considerable infrastructure support necessary to sustain use of the technologies. Conversely, technologically advanced countries are so accustomed to the existence of infrastructure support that they often assume that it can be readily provided or rapidly

strengthened or increased in developing countries. They underestimate the social, cultural, and political constraints that can so effectively hamper attempts to effect change. If these oversights occur, the results of the new technology will rarely meet the expectations of either the provider or the user.

To be appropriate a technological tool must account for the social, cultural, political, and economic factors inherent to a given situation as well as for the technical soundness of the solutions. Generally, the technology can be designed or modified to meet the situation, and to some degree the situation can be modified to meet the technology. But if the technology is too far ahead of a society or advances so rapidly that the society cannot catch up, then the attractive bond that links it to society will be broken. If, however a balance is maintained between social and technological adaptation—each augmenting the other—technological progress will be achieved.

Needs for Appropriate Technology in the Countries of Latin America and the Caribbean

The countries of the Region are not alike in their technological needs. Some are quite advanced technologically, while others are only in the initial stages of technological development. Nevertheless, each of the countries has appropriate technology needs relative to water supply and sanitation, which can be categorized in phases: development, identification, dissemination, promotion, utilization, and evaluation. The spectrum of needs will be different from country to country and within each country; but, to some degree, all of the phase categories must be addressed by a country to assure appropriateness. Within a country the capacity to absorb new technologies and to utilize existing ones is generally greater in developed municipal areas where more resources are available. While the need for appropriate technology always exists everywhere, it is particularly critical in remote rural communities and poor urban-fringe settlements.

Software. There is a need to increase not only the countries' technological capabilities but their capacity to apply technologies to the solution of their problems. The institutional development of agencies and organizations requires appropriate technology components. The appropriate technology concept should be developed and included in the teaching of techniques and methods as well as their development. Expanding and

augmenting information system networks is likewise usually necessary to assure achieving appropriate technology. The need for more appropriate technologies in all phases of water supply and sanitation development is already great, and their application will have to continue to increase if the goals of the International Drinking Water Supply and Sanitation Decade are to be attained.

Hardware. The most prominent needs for appropriate technology hardware exist in rural areas, small towns, and poor urban-fringe settlements. Leading the list is the need for a simpler, more reliable method of disinfecting drinking water—a serious problem even in the most developed countries. Next in importance are more appropriate methods for pumping water, possibly utilizing alternate energy sources. There is need for simpler and more economical methods of treating water. Equally critical is the need for appropriate technology for collection, treatment, and final disposal of excreta and wastewater and municipal refuse.

The Role of the Pan American Health Organization

PAHO is directing its efforts toward maintaining a balance between technological advancement and social support structures so as to gradually increase member countries' capability to absorb technology, to carry out local innovation in technologies, and to increase indigenous investment in appropriate technology.

PAHO activity will be based on the strategy of promoting in-country self-reliance to develop or adapt existing technology to meet local needs. Proximity of the utilization area along with frequency of follow-up (visits and correspondence) by personnel responsible for selecting and developing a particular technology are important factors in identifying necessary modifications and obtaining accurate, current information. Therefore, emphasis will be placed on enhancing in-country capability in both the hardware and software aspects of appropriate technology. Although it is theoretically possible through improvements in software to achieve improved hardware, from a practical standpoint it is more effective and efficient to improve them simultaneously because progress—insights, ideas, and improvements—in one aspect often leads to progress in the other.

Improved mechanical devices or equipment in and of themselves do not result in breakthroughs in water supply and sanitation services. Almost always service breakthroughs are the result of improved institutions, with "new" technological devices merely serving to catalyze progress. Conse-

quently, PAHO efforts will concentrate more on the promotion of software than of hardware.

The table shown below summarizes the areas of PAHO activity in appropriate technology. It utilizes a visual system for approximate weighting of efforts to be undertaken in which a single X represents a relatively small effort. As the effort increases, the number of Xs increases with 5 Xs indicating the largest effort. The rows of vertical columns are divided into six phases of appropriate technology: development, identification, dissemination, promotion, utilization, and evaluation. Although, for the purpose of clarification, these phases are listed in their usual order, in practice there is frequently no clear division between them and sometimes the sequence is different. The vertical columns are divided into two broad categories, hardware and software, which are in turn subdivided into tools, materials, equipment/machinery; and concepts/designs, techniques/methods, and subprograms. As mentioned above, software is more stressed than hardware, and the dissemination and promotion phases are most heavily stressed.

The appropriate technology strategy will be incorporated into other PAHO activities in the Region with a focus on enhancing in-country capability and encouraging intercountry collaboration in both the development and transfer of appropriate technology relevant to drinking water supply and sanitation. This concept is well illustrated in the program of PAHO's Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS) in Lima, Peru.

CEPIS is the central processing unit for the Pan American Network for Information and Documentation of Sanitary Engineering and Environmental Sciences (REPIDISCA). Twenty-seven cooperating centers have already been established in Argentina, Brazil, Chile, Colombia, Peru, and Venezuela and will continue to identify, enter, coordinate, and pro-

Distribution of PAHO Efforts in Appropriate Technology.

Phase	Generic Hardware			Software		
	Tools	Materials	Equipment/ Machines	Concepts/ Designs	Techniques/ Methods	Sub- Programs
Development	—	—	X	XX	XX	XX
Identification	XX	XX	XXX	XX	XXX	XXX
Dissemination	XXX	XXXX	XXXX	XXXX	XXXX	XXX
Promotion	XX	XX	XXX	XXX	XXXX	XXXXX
Utilization	X	X	XX	XXX	XXX	XXXX
Evaluation	—	X	X	XX	XX	XX

vide information with emphasis on practical, appropriate technological information for developing countries. In the near future, efforts will be devoted to establishing additional centers in Costa Rica, the Dominican Republic, Ecuador, Mexico, and Paraguay. When complete, this network will make up-to-date, relevant information readily available throughout the hemisphere. Because of the stress on practical information, a great deal of the data entered and utilized falls into the area of appropriate technology for water supply and sanitation. An annual publication *REPINDEX* provides a yearly summary of the information entered and available in the network. A quarterly supplement summarizes additional information entered during the interim. Hundreds of requests for information have already been answered, and the demand for more is increasing rapidly.

Training courses to be conducted by CEPIS also contain a strong appropriate technology orientation. Where feasible, these courses will be held jointly with member countries and within the country rather than at CEPIS. They will include training in subjects such as macrometering, micrometering, evaluation of distribution networks and control of leaks, evaluation of water treatment plants, design of water treatment for rural areas, operation of water supply systems in emergencies, design of submarine outfalls and low-cost sewage treatment systems, and disinfection of water for rural areas.

CEPIS has submitted a proposal to design, construct, and evaluate a low-cost water treatment plant for small rural communities using appropriate technology concepts.

In conjunction with various courses, studies, and workshops, CEPIS will produce a number of manuals that focus on appropriate technology: simplified analysis of sewage; bacterial analysis of sewage; design of submarine outfalls; control of eutrophication (to avoid drinking water quality problems); evaluation of rural water supply and sanitation programs; and operation of rural aqueducts.

Other projects include a cooperative arrangement between PAHO and the Water and Sanitation for Health (WASH) project of the Agency for International Development of the United States, which is expected to result in the testing of a water-powered hydropneumatic pump. Work is also being carried out on the development of an appropriate technology fluoridator for small rural water supplies, which will involve the field-testing of pilot units in the near future. Finally, staff is studying the feasibility of on-site production of disinfectants in rural areas by electrolysis of salt solutions.

Chapter V

Institutional and Human Resource Development

INSTITUTIONAL ASPECTS

If the countries of the Region are going to extend coverage of water and sanitation services to their people by the end of this decade and with a minimum of cost to the community, they will have to develop the technical and administrative capabilities of the institutions responsible for those services. The governments have recognized the importance of institutional development since the mid 1960s, and PAHO has since that time been providing technical cooperation in support of national efforts in this direction.

Large financial investments are in and of themselves not enough to assure the provision of services to everyone. The institutions responsible for those services must be strengthened and adapted so that they can handle changes in their operations caused in part by the very investment programs they are administering. Moreover, increases in demand have resulted from the population explosion, the spread of urbanization, and the growth of industrialization—making it ever more difficult to provide basic sanitation services. As cities have grown, resources have tended to concentrate there, hence diminishing the possibility of extending services to rural and periurban areas.

The need for institutions to adapt, to utilize modern management techniques in reaching their objectives, has not always been met. In many cases, the institutional situation has in fact not only not improved but even deteriorated, thereby jeopardizing both the execution of large-scale investment programs and the efficiency—in terms of administration, operation, and maintenance—of the installed capacity. Obviously, these effects in turn compromise the attainment of coverage goals.

The readying of institutions to handle large investment projects is even more critical if account is taken of the projected need to triple in the 1980s investment in the sector over that of the 1970s in order to achieve the cov-

erage levels set by the International Drinking Water Supply and Sanitation Decade and to incorporate new strategies in the process. The investment required is expected to rise—according to data extracted from sector studies made as part of the WHO/PAHO/World Bank Cooperative Program—from US\$1,600 million per year on average in 1971–1978 to US\$5,000 million per year in 1979–1990, to reach a total calculated at constant 1978 prices of US\$60,000 million. This will consequently call for a commensurate increase in the capacity of the sector to generate projects and carry them out.

The Decade coverage goals correspond, in population terms, to an additional 230 million people in urban and rural areas with access to water supply, and 220 million with sewerage service, plus 130 million rural dwellers with excreta disposal facilities. Altogether, this would mean a more than doubling of people receiving water supply services and a tripling of those with sanitation services as compared to populations served in 1978—a formidable challenge for the administration, operation, and maintenance of sector institutions.

By setting measurable goals, the Water and Sanitation Decade has generated greater awareness of the need for improvement in the sector. As a result, the countries' water and sanitation agencies are being stimulated and challenged to perform as well as agencies in other sectors. While many of the countries have a deficient water and sanitation sector, they manage to have reputable airlines, communication systems, and postal services that boast of high levels of technical performance. Economic underdevelopment is no longer an acceptable excuse for unsatisfactory institutional performance. Indeed, the problem would appear to stem from an absence of, or indifference to, political and social pressure to radically improve the present situation by means of innovative approaches. Immediate action must be taken to remedy this. Encouragingly, it would appear that almost all the agencies in the sector are seeking answers to what they perceive to be the causes of their problems.

To further understand the implications of the Decade for the institutional aspects of the sector, the provision of water supply and sanitation services should be analyzed from two points of view: the sector as a whole and the institutions in particular.

Analysis of the Sector

During the period 1977–1978, sector studies were carried out in 19 countries of the Americas as part of a WHO/PAHO/World Bank Cooper-

ative Program. Sector institutional structures were analyzed according to their main functions, namely:

- *Global planning*—determination of the proportion of the country's total investments to be allocated to the sector.
- *Sector planning*—formulation of investment plans for the sector within the global context and review of the feasibility of the goals set.
- *Project and works management*—identification and preparation of projects prior to execution.
- *Operation and maintenance*.

Global planning. The studies showed that overall national planning for the sector is done by a ministry or secretariat of planning. Sector authorities generally do not participate enough at this level in determining the amount of investments earmarked for water supply and sanitation—either because they do not have specialists for the purpose or else because the macro-planners are not really familiar with the sector. This lack of participation has had negative implications for water and sanitation investment plans (see also Chapter II on “Planning”).

Sector planning. This is handled by various types of institutions. In three-fourths of the countries, it is the responsibility of the ministry of planning or its equivalent in the sector (public works, urban development, housing, etc.), or of a national water and sanitation institution. In the remaining one-fourth, these institutions share the task with the ministry of health, which has the main responsibility for rural areas. Sector planning—which ought to go hand in hand with global planning, serving to translate goals into specific projects—does not always achieve its purpose because a comprehensive feasibility analysis is not done that would take into account the economic, financial, human resource, and institutional aspects. Too often, this level of planning is limited to drawing up a list of investment projects, without providing the relevant analyses and justification.

Project and works management. Although the countries have made efforts to improve project planning, there are still deficiencies in project preparation—mainly in the identification and selection of projects and their economic and financial analysis. As a result, the allocation of resources has been poor, owing to their dispersal over a large number of projects or to the oversizing of systems. This has also delayed the execution of other priority projects or postponed the installations required for their proper operation.

Most of the countries have contractors that can handle the construction of systems, which generally proceeds without snags if there is the flexibility to cope with inflation and the capability to award effective contracts and carry out supervision. On the other hand, poor planning in regard to the procurement of materials and equipment often causes delays when these are in short supply due to the lack of parallel planning to boost national industrial production capacity. Some countries have instituted financial and tax incentives to strengthen national capacity as well as subregional mechanisms and policies designed to make it possible to meet the demand generated.

Operation and maintenance. In two-thirds of the countries, institutional arrangements are characterized by a high degree of centralization at the national level, although the services are local in nature; only one-tenth are considered decentralized. In one-third of the countries, the structure is divided up among a number of institutions at different levels—national, regional, metropolitan, municipal, and local community—with often quite ill-defined spheres of action.

Half of the countries have regional or municipal agencies that are mainly responsible for the urban sector from the stages of project preparation to system management. In most cases, however, there exist other institutions of a national character that are also involved in activities at the regional and local levels.

In rural areas, and mainly in the operation and maintenance of systems, two main trends are evident: the first, found in two-fifths of the countries, is total centralization of system operation in national institutions, either in the ministry of health or an autonomous institution; the second is total delegation of system management and operation to the communities through local boards, assisted if need be by national institutions through their regional agencies.

Lines are frequently not clearly drawn among the different institutions as to the limits of their responsibility, which generally depend on the population in the different localities and their degree of concentration or dispersal. The countries have usually considered rural population centers to be those with upper limits ranging from 100 to 5,000 people; those limits are set in most cases without studying criteria needed to organize a community effectively for the proper management, operation, and maintenance of systems.

Operation and maintenance, as already noted, is handled by a number of different organizations—ranging from mixed-economy agencies at lo-

cal or regional level, to public ones in municipalities, departments, or provinces that are less well equipped to perform their functions, and to national institutions where decision-making is highly centralized and communication among the various levels consequently problematic.

Institutional shortcomings are compounded by the lack of trained personnel and funds to effectively operate and maintain systems, as will be subsequently discussed in the section on human resource aspects and the chapter on financing.

Other constraints are the lack of suitable instruments for programming, monitoring, and evaluating activities; poor quality and flow of information; lack of manuals, catalogs, and technical records needed to manage system operations and maintenance properly and to train personnel effectively; lack of coordination between the project preparation, execution, completion, and start-up stages; and snags in preventive maintenance because essential parts and materials are often not available.

Commercialization of services. This aspect, which is vital if the sector is to become self-financing, is carried out in most of the countries—if only partially—with the same institutional arrangement as operation and maintenance. Only in the last few years has commercialization come to be understood as a necessary approach, and it is still in an early stage of development. Little is known of service users, their ability and willingness to pay, and their consumption patterns. Few activities are carried out in the areas of promotion and commercialization; those that are include marketing studies and effective measures to attack the problems of high pending debts, illegal connections, and users with access to service but without interest in connecting to them.

Utilities should engage in the marketing of water supply services to encourage public access to the system. System connections should be made expeditiously. And, instead of waiting for the public to request service, the utility should identify unserved, potential users and promote its service among them. The financing of water supply connections should be charged for on an installment-plan basis. Unfortunately, substantial cash connection fees are often required to hook up to the public system; such a one-time cash outlay is out of the question for low-income households, who could however afford the fee if allowed to pay over a number of years.

In marketing water supply and sanitation services, management should take into account potential users' ability and willingness to pay for them so that the cost of services provided is compatible with people's ability to pay. This should include surveys of income levels and consumption patterns.

Equitable tariff structures would permit complete cost recovery and financial self-sufficiency if appropriate cross-subsidies are introduced and service cost levels related to income levels.

Poor consumer records, lack of metering, and poor billing and collection practices are the main commercial-related problems of agencies. Some of the countries still lack adequate metering policies, appropriate procedures and resources for meter management and maintenance, and trained personnel—problems which prevent the sector from becoming financially self-sufficient. This could be remedied by the establishment of tariffs based on metered consumption, with excess consumption charged at full cost to reflect production costs.

The poor financial performance of water supply and sanitation agencies is due in great part to the absence or inadequacy of studies and reliable information for decision-making as related to the commercial aspects of services. High rates of unaccounted-for water are commonplace and likewise result from the absence of macro-metering at different points of the system, poor consumer records, inadequate metering of consumption, unauthorized connections, and other operation and maintenance problems.

Other sector institutions. Very few countries have established financial institutions for the sector that ensure the recovery and cash flow availability of the resources it requires. This greatly inhibits development of the sector, by making it largely dependent on the national budget for funding. On the other hand, it usually takes a long time to obtain credit from international lending and donor agencies because of involved preparation and negotiation requirements; moreover, funding from these sources is usually intermittent. These limitations make it difficult to establish the necessary managerial and operational capacity for administering and executing sector plans.

At the same time, only a few countries have formulated national tariff policies and set up the agencies and mechanisms required for applying them and supervising their results. This means that most of the countries lack the institutional means to put into practice the economic and financial policies of the sector.

Analysis of the Institutions

Over the past two decades, the countries have gone to great lengths to strengthen their water supply and sanitation institutions. Nevertheless, it is important to analyze those institutions and the various factors affecting

them to determine their suitability for performing their functions and to understand the constraints under which they operate.

A number of the major cities and metropolitan areas—and even some regions—have established decentralized, mixed-economy corporations based on commercial principles. These corporations have been set up with a view to accelerating attainment of extended coverage goals, through financial self-sufficiency and the application of modern management techniques that ensure efficient management and operation and effective delivery of services to the community.

Because most of these corporations were formed from various municipal agencies and therefore had to change from a public to a more commercial approach, numerous difficulties had to be overcome. Many organizational problems still exist in those agencies that have not been able to modify their policies, aims, procedures, and staff performance in line with a commercial approach. By continuing to follow the traditional practices of public agencies, they are failing to have the impact that they should.

Moreover, development has too often been construed to mean project preparation and execution, without enough attention being given to other phases in the system, namely operation, maintenance, and management. As a result, these phases are deficient, project facilities suffer, and the purposes for which they were constructed are not fully achieved.

In rural areas, as noted above, institutional arrangements are usually not clearly defined. A number of countries are, however, working to strengthen the administrative capacity of the communities themselves—and with positive results. One particularly effective step is the establishment of community sanitation boards or committees that are appropriate for the particular sociocultural circumstances of the locality. These boards are provided with administrative, budgetary, and accounting instruments; manuals for operation and maintenance, billing and collection, etc.; health education, logistic and maintenance support, and training for their personnel. They are assisted in their turn by national entities, either autonomous institutions or agencies of the health ministries.

Even given the mechanism of the community board and its support at the national level, the sector should strengthen links with the community and promote its fuller participation, which will require finding solutions to a number of institutional problems.

Political leadership and management in sector institutions are hampered by two constraints: insufficient communication between authorities and those responsible for overall planning for the country; and high turnover

of senior staff. These two factors weaken the direction and leadership needed by the institution—both in its relationship with the external environment and in the interaction among its various internal levels.

Top management is the political level responsible for the relationship of the institution with its outside environment. It must negotiate and get involved with the community and other external elements that control the delegation of authority and the access to and distribution of resources. Top management is also charged with achieving the goals of the institution by making sure that it adapts to changing conditions in the environment. Failure of the political level to articulate the performance of the institution with the sector and the community through adequate strategic planning often means that its priorities are misplaced, that its efforts are concentrated on day-to-day operations. This can profoundly affect the entire structure of the institution.

The operational or technical level is responsible for “how” things are done—operational planning and control. This level should have clearcut and appropriate objectives, policies, aims, techniques, and procedures or else top management will get too involved in the internal routine of the institution. The frequent lack of trained personnel and basic information often prevents those at the operational level from taking decisions. They may be further inhibited by the “bureaucratic fear” of taking risks that might compromise them. Consequently, top management makes most of the decisions, even operational ones, which results in a centralized and autocratic administration.

The middle management level, which mediates between top management and the operational level, is responsible for tactical planning and management control, including the allocation of operating resources needed to attain the objectives set and to monitor and evaluate progress. It interprets the policies and strategies outlined by top management and translates them into activities and programs to be carried out by the operational level.

Ideally, then, from the bottom of the organization the activity of the operational level should diminish as it rises in the hierarchic scale, while the same should occur with the involvement of top management on going down the scale. This permits the establishment of an equilibrium or balance that is very important for sound administration.

This balance is, however, lacking in many water supply and sanitation

institutions—either because of the misdirected involvement of top management in operational matters, the unwillingness of the operation level to take decisions, or because the middle management level is nonexistent or inefficient. What often occurs is that—in order to have the largest possible number of persons share the responsibility for decisions—middle management tends to merge with top management.

Another drawback to decision-making is the lack of basic information for management control. This makes it impossible to evaluate performance of the institution, to make timely decisions as to what corrective measures are needed to attain the objectives that have been set, to develop new operating rules, and to redistribute resources.

In extreme cases, this reluctance to take decisions—as a result of conflicts of interest between the different levels, the lack of basic information, and the absence of certain organizational elements—may ultimately lead to the assumption of decision-making by groups in the outside environment whose interests might not always match those of the institution. Such decisions frequently do not take into consideration the technical, economic, and financial feasibility of proposed projects and programs.

When this process becomes irreversible, the institution loses the confidence of the community as well as that of other institutions, and the tendency then is to create a new institution to achieve parallel aims and purposes. Obviously, this results in a number of problems, including duplication of effort, fragmentation of resources, overlapping in some areas, and failure to act in others owing to lack of coordination.

The improvement, strengthening, and development of any institution or group of institutions within the water and sanitation sector that is beset with complex problems such as those described in the preceding paragraphs, require the prompt application of effective measures and appropriate solutions.

HUMAN RESOURCE ASPECTS

The water supply and sanitation sector throughout the entire world, but especially in the Americas, has a long history of developing human resources. Years before consideration was given to preparing engineers for sectors such as communications and air transportation, numerous sanitary engineers were being trained. Shortages of qualified personnel for the water and sanitation sector were for quite a long time not a major problem. In the history of many of the countries in the Americas, the water systems of important cities represent significant achievements, a source of

national pride, and the symbol of a high degree of development. At the end of the last century and the beginning of the present, water systems in the large metropolitan areas were generally constructed, operated, and maintained by well-organized companies, with good performance records and a satisfactory level of service. As evidence attesting to the importance of sector development, almost every country in the hemisphere has among its prominent sons one or more representatives of the early water and sanitation sector campaigns.

Today that situation has changed dramatically. Few countries would currently consider their water and sanitation sector among the most developed and satisfactory. While communications, energy, transportation, and other basic sectors have experienced huge improvements, development of the water sector has been somewhat limited. Water agencies in many countries are being labeled bottomless pits for financial resources. Indeed, most indicators of institutional performance demonstrate that few water agencies could be considered successful in achieving their goals. Almost any institutional diagnosis of water and sanitation agencies will indicate that no single factor is the cause of this situation; rather, numerous related factors are responsible for and perpetuate poor institutional performance, as already mentioned in the preceding pages on institutional aspects.

A lack of financial resources and the scarcity of skilled human resources are generally singled out as the main obstacles to achieving better performance. Although no one could possibly doubt the paramount importance of these two factors, they do trigger a number of questions. Are the human resources presently available being used to the utmost of their actual capacity? Would more money and more people solve existing problems, or simply create new ones? Are the concerned institutions prepared to provide their people with the conditions and tools necessary to perform adequately? In many cases the answer to these questions would have to be an unqualified "No". Yet it is generally within this scenario—one that vacillates between the awareness of needs and the lack of commitment to meet them effectively—that managers reach the decision to carry out major training programs. Although the lack of skilled staff is more or less evident at every level of any organization, it is doubtful that its performance could be considerably improved simply by training people.

Much is being said about the human resources needed to meet the Decade requirements of the water and sanitation sector. Most of the data and projections are, however, merely educated guesses. Actual demand can only be defined at the level of each system. However, to give an idea of the magnitude of need it is instructive to look at estimates regarding both

those personnel already employed in the sector but underprepared as well as those to be incorporated in it in order for countries to meet their targets for the Decade.

Almost all the 300,000 people working in the sector today need further training, and to accomplish the goals of the Decade it is projected that a further 400,000 new people will have to be trained to work in urban and rural water and sanitation systems. That means roughly 700,000 people will have to receive training of some sort, and that figure does not include individuals in the community who will have to be instructed in various system construction, operation, and maintenance aspects. Moreover, each of those trainees will have to learn an average of three tasks each, for a total of 2.1 million new training opportunities necessary during the Decade. It is thus critical that the countries design and implement appropriate strategies for the development of their human resources.

The Need to Implement Changes

Generally speaking, as mentioned before, the water and sanitation sector has fallen behind other sectors in terms of performance and satisfaction. To improve this situation the Decade is proposing a course of action to overcome some of the present constraints. This is a difficult task, especially given the complexity of sector institutions and the fact that institutional performance can only be changed by changing group and individual performances.

To accomplish this, the institution might have to redefine or restate its objectives and tasks in order to then set in motion its strategy—that set of key decisions aimed at matching the institution's resources with the opportunities, constraints, and demands present in the environment and within the context of social values. Moreover, certain preconditions must exist before efforts to effect change can succeed. Often such preconditions have to be “generated” prior to the initiation of any activity. They include:

- *Social and political pressure for change.* Although the Decade is intended to be a global commitment to provide pressure for change, many countries will require additional impetus. To initiate and sustain the desired change, pressure must exist not only internally within the organization, but also externally among authorities, the general public, consumers, community groups, and the media.
- *Leadership at the top level of management.* To succeed, the Decade will have to enlist the commitment of key managers to provide leadership from “the top

down.” That commitment is critical to the introduction into an existing institution of a new culture, one where the implementation of a managed process will be welcome. This leadership will be evidenced in provision of the necessary motivation and resources.

- *Willingness to experiment with new solutions.* A series of actions will have to be taken to motivate people to accept change. Individual and collective incentives and rewards may be needed to “shake” the institution out of its inertia and make it receptive to new ideas and innovative courses of action.
- *Collective participation.* There must be a true spirit of cooperation at all institutional levels in identifying problems and constraints, planning improvements, and evaluating results. Institutions are constantly affected by the changing conditions of their external environment. Ongoing modifications in environmental conditions will continuously pose the need for new institutional goals. As a consequence, institutions will constantly be in need of undergoing a continuous process of planned change. It is at this juncture where institutional and human resource development—two inseparable concepts to the carrying out of a continuous process of change—take shape.

INSTITUTIONAL DEVELOPMENT: A PLANNED PROCESS OF CHANGE

Institutional development is understood here as a strategy for implementing planned organizational changes to adjust the institution to its environment in order to attain its objectives. It has also been defined as an educational process aimed at achieving a planned process of change. In either case, it focuses on modeling individual and collective behavior as well as increasing knowledge and skills specifically required to achieve well-defined institutional goals. That, in turn, will require a systems perspective that identifies interdependent functions and prescribes individual tasks in terms of responsibilities and authorities. Institutional development is also predicated on the incorporation and adoption of changes in the values and culture of the institution, implementation of appropriate techniques, and development of human resources. In addition to objectives, feasible goals, and a systemic approach it will require: scheduling of the different stages of the diagnosis; analysis and formulation of models; their implementation, evaluation, and adjustment; financial resources for execution and implementation of the recommendations and models that are developed; legal resources; a change agent; a methodology; and, above all, human resources and the organizational mechanisms necessary to develop personnel that match the knowledge, experience, and attitudes required in the process of developing an institution.

This change in values implies that participants be well informed about the process and its results in order to establish both an institutional and an individual will to bring about change. It is essential that the change agent maintain a cooperative or coparticipative working relationship with all personnel at the various levels of the organization.

Participation ought to be relevant to the techniques to be introduced within the organization. For instance, once management-level deficiencies have been identified, models aimed at correcting them ought to be elaborated. Simultaneously, a strategy should be defined to train personnel in management tasks while the model is being applied. In this way, better institutional performance can be achieved and information can be generated to support top management in the decision-making process.

From the foregoing it is evident that improvement in the performance of institutions in the water and sanitation sector is predicated on the development of human resources.

HUMAN RESOURCE DEVELOPMENT: RESPONSE TO A PLANNED PROCESS OF CHANGE

Human resource development in turn will necessitate elaborating organizational and managerial instruments and mechanisms and, most importantly, motivating people and providing them with the skills to employ those instruments and mechanisms. Human resource development is understood here in the broad sense of social promotion of the human being. In addition to training, it includes aspects of the administration, utilization, and quality of personnel in their working environment. Consequently, the education and training process should never be considered an end in itself; rather, it should always come in response to a demand posed in the course of providing services. In other words, education and training will be instrumental in developing a plan of action, which must exist prior to starting training and educational activities.

This means that, to be truly effective in terms of improving performance, education and training, activities must aim at preparing human resources to be change agents so that newly established institutional goals can be attained. Institutions and human resources, it can not be overemphasized, are interdependent aspects of a single process: institutional performance is in fact a result of the combination and sum of the behavior and performance of each group as well as of the behavior and performance of each individual.

To this end, the systems approach enables development of an occupa-

tional matrix whereby—given an overall objective and a plan of action—the responsibilities and functions of the entire institution can be identified. It thus provides a solid base to plan human resource development, establish coherent employment and training policies, develop staffing patterns, identify occupational and educational profiles, and conduct performance-oriented training. In sum, training should always be carried out as the result of previous planning and as an integrated part of overall institutional or sectoral planning. Such an approach will make possible the identification of profiles for each occupation throughout the institution in accordance with established goals and objectives. It also affords a systematic way of specifying the quantity and quality of human resources needed within a given time frame. Education and training—while only a single aspect of human resource development—are nevertheless a very important one. Water agencies should therefore not have to carry alone the entire burden of preparing their human resources. It should rather be a cooperative effort involving the formal education system, training within agencies, and external training.

The formal education system. Education will have to be provided through this system—universities and vocational education institutes—in accordance with the needs identified by water and sanitation sector institutions. The entrance of better and more specifically educated people into an agency will drastically reduce the need for in-house training. Unfortunately, only on very few occasions has collaboration of the formal education system been requested in a systematic way by water agencies. The educational sector and water and sanitation agencies should establish strong links of cooperation and commit themselves jointly to planning and sharing resources to carry out activities and evaluating the effectiveness of those activities. Water agencies should be prepared to specify exactly what they expect from educational institutions. They must have clear ideas as to how many, when, and what kind of human resources they will need. Once these needs are clearly understood, the educational system can plan how to satisfy them. This mutual reliance is further reinforced by the fact that many of the institutions in the water and sanitation sector in Latin America make a levy contribution of 1 per cent of their payroll to maintain the vocational education system.

In-house and external training. The need for training activities can be identified basically in three situations:

- When existing personnel are requested to perform in a new situation and work toward new objectives.

- When new personnel are requested to perform according to already established standards.
- When a performance deficiency is evident.

When a performance deficiency is involved, relatively accurate assessment of the nature of the deficiency will be necessary. Such assessment will help to identify solutions in addition to training since only human performance deficiencies can be corrected by training. It should be determined if the deficiency is due to management or administration; motivation, incentives, or attitudes; or skill or knowledge.

Once it is decided that a training solution is the proper way to eliminate or minimize a performance deficiency, someone has to be chosen to do the training. Many institutions have some in-house capability to carry out training. When this is not the case or when the demand for training exceeds the internal capacity, the institution must match its training needs against external resources and trainers. The size of the internal training capability is typically a policy decision based on efficient resource allocation. Nevertheless, this capability is expressed in terms of available installations, equipment, and trainers. In many institutions, foremen, supervisors, superintendents, and general managers have among their duties that of training. They can be utilized to train their subordinates or peers both informally on the job and formally through the conduct of organized, programmed sessions. Furthermore, most agencies have invested heavily in broadening and updating the technical and administrative capability of their professionals. It is in their best interest to create a multiplier effect whereby those professionals transfer the knowledge they have acquired to their peers; for instance, fellows should be encouraged to return to their place of work to in turn train their coworkers. To be effective, these "potential trainers" will have to have more than technical knowledge to be skilled in communication and training techniques in order to perform their training tasks well.

Training, whether it is conducted internally or externally, has to be performance-oriented within the framework of specific institutional needs.

Utilization of existing human resources. Most people are stimulated and motivated by their own achievements and the feeling of being able to perform, but they also need a certain degree of security and self-confidence. Challenges, risks, and the unknown are welcome only if presented in manageable quantities. People simply perform more and better in a situation for which they feel prepared. Likewise, they produce more, better and

derive greater satisfaction when doing something with which they are familiar and for which they have been trained.

Identifying people's true capabilities and making good use of them is a very important aspect in the management of human resources. Frequently people are trained to do a job only to be made responsible for performing something for which they have no skills or talent; often a good technician is "promoted" to an administrative post where his performance will be unacceptable. When people are selected to be trained for new positions, it is important to match their talents and aspirations with the needs of the institution.

Equally important is the fact that people only perform up to their total capacity if provided with adequate tools and instruments within a quality working environment. Furthermore, all workers must have a clear idea of what is expected of them and constant feedback as to the extent to which they are meeting that expectation. Too often today the job that could be done by one motivated person, is left to be performed by several unmotivated ones.

National and International Strategies

Countries should try their utmost to achieve self-reliance in developing their human resources for the Decade. No international mechanism is capable of preparing all the manpower needed, nor is there enough money available to cover a significant part of the costs of such a gigantic undertaking. Moreover, complete dependence on outside organizations to achieve the goals of individual countries only serves to thwart national creativity and retard progress toward national self-reliance.

In this context, a national human resource development program should consider:

- Establishing tangible goals for institutions within the national water and sanitation sector.
 - Establishing standards of group and individual performance related to institutional goals.
 - Assessing performance of existing manpower in relation to established standards.
 - Projecting future manpower requirements in relation to institutional goals and standards of performance.
 - Taking an inventory of existing training and educational resources.
 - Establishing personnel and training policies.
 - Planning medium- and long-term activities to meet future requirements.
- This will call for the carrying out of training programs, continuous assess-

ment of relevance and effectiveness, monitoring in relation to institutional and sectoral goals, and providing feedback into the system for adequate political and managerial action.

- Planning short-term activities to meet present requirements.

The main obstacles to carrying out these actions will be time and money—problems that are aggravated by the geographic dispersion of the people to be reached. Low-cost training approaches, self-paced and distance teaching will have to be used as much as possible. Virtually all this technology already exists, although it is not being applied in the water sector, where traditional approaches are more common. It is in this regard that international agencies can make a major contribution, including the production and distribution of guidelines, standards, models, job-aids, and other materials to facilitate the management of human resource development programs and the collection and redistribution of material and experiences from national projects and programs. International agencies should at the same time maintain their role of developing and disseminating technologies and experiences through information systems, training programs, consultations, and other forms of cooperation.

Most of the developing countries in the Americas are already capable of doing much more for themselves than is generally believed. What is lacking most is a strong political will to achieve specific goals, supported by a core of motivated, skilled, and equipped personnel. Once those obstacles are overcome, the resulting “do-it-yourself” approach will make it possible not only to achieve the goals of the Decade but to maintain high standards of service beyond the ten-year period.

ROLE OF THE PAN AMERICAN HEALTH ORGANIZATION

Strengthening of the water and sanitation sector, of its institutions, and of their human resources has been recognized as a strategic element for attainment of the goals of the International Drinking Water Supply and Sanitation Decade. For that purpose, a catalytic agent is needed to foster the institutional development of the agencies. Adaptation of institutions to enable them to meet the challenge of the Decade requires a continuous and planned process of change. PAHO efforts will therefore continue to be geared toward improving the effectiveness of water supply and sanitation agencies and increasing the absorptive capacity of the countries through institutional and human resource development, which entails improvement of planning; operations; commercial, financial, and administrative

support aspects; and management information systems for those agencies. To carry out this role, the Organization will:

- Support the planning, formulation, execution, and evaluation of institutional and human resource development aspects in national sector plans.
- Coordinate with international lending and donor agencies in project identification, preparation, and financing.
- Collaborate in preparation and execution of national, subregional, and regional programs and projects.
- Develop guidelines, methodologies, and models to support technical cooperation for regional, subregional, and national programs and projects for the development of institutions and their human resources.
- Cooperate in the formulation of training and educational materials, activities, and mechanisms for human resource development.
- Cooperate in the development of local rural institutional schemes and education and training required for system management, operation and maintenance with *community participation* and as part of the primary health care approach.

In addition to the above-mentioned role, and in order to cooperate with the countries of the Region in both evaluating and monitoring progress toward the goals of the International Drinking Water Supply and Sanitation Decade and of health for all by the year 2000, PAHO staff is developing a Regional Evaluation and Monitoring System, as mandated by its Governing Bodies. The regional system, which is being coordinated with the Decade global system developed by the World Health Organization, should serve as a catalyst to strengthen managerial processes for national health and environmental health development. In this regard, PAHO will promote and foster the development and implementation of national water supply and sanitation information systems needed to provide data essential to evaluating and monitoring Decade plans at the national and regional levels. Specific activities will include:

- Monitoring and evaluating regional progress in accordance with the strategies of the Regional Plan of Action for Health for All by the Year 2000 and with WHO requirements for the Decade.
- Holding subregional and national workshops to disseminate methodology and program-related follow-up activities.
- Supporting establishment in the countries of information systems and evaluation and monitoring processes.

Chapter VI

Financing

The efforts made by the countries of the Americas in the past two decades to extend water and sanitation service coverage to as many people as possible have been relatively successful. Providing these indispensable services to so many millions has required the investment of enormous sums of money—as much as US\$12,630 million (in 1978 dollars) in the period from 1971 to 1978. Figures for more recent loans by international credit agencies and national matching funds for those loans are shown in the table below:

Funding by International Lending Agencies of Urban and Rural Water Supply and Sanitation Projects in Latin America and the Caribbean, 1978-1983
(in US\$ millions—current value).

	1978	1979	1980	1981	1982	1983**
International Bank for Reconstruction and Development loans	149.5	169.8	316.0	346.5	40.6	424.2
Inter-American Development Bank loans	110.7	86.9	199.55	187.8	265.3	—
Total of IBRD/IDB loans	260.2	256.7	515.55	534.3	305.9	—
National matching funds for IBRD and IDB loans	1,213.5	349.65	992.67	742.0	42.8*	678.4
TOTAL	1,474.7	606.35	1,508.22	1,276.3	348.7	1,102.6

*For IBRD loans only.

**Fiscal year through June 1983.

Notwithstanding the magnitude of funds that have been invested to date, considerably more will have to be channeled toward the sector if the Decade targets are to be realized. In fact, the external funding share of total sector investment has been diminishing from 20 per cent in 1971 to 8 per cent in 1978. That trend can be expected to continue for the next few years, and countries will have to pick up the slack. At the same time, however, many governments may become overwhelmed at the prospect of generating the funds projected to be necessary for water supply and sani-

tation programs—a reaction that could hinder national commitment to the Decade. This comes at a time, as mentioned elsewhere in this document, when the dual crises of inflation and recession have gripped the economies of countries worldwide. Thus, without question, financing represents a major hurdle to initiating, expanding, and sustaining water and sanitation programs; the countries' relative success or failure in clearing that hurdle will dictate whether they attain or fall short of the goals of the Decade.

Even as the Decade was being conceived, it was understood that financing would pose a major challenge. The Mar del Plata Action Plan addressed the question of means of financing prospective sector activities, including:

- Promoting in each country larger allocations from the total resources available for socioeconomic development.
- Increasing financial contributions of international communities to strengthen cooperation with governments in the extension of community water supply and sanitation.
- Developing a national revolving fund, financed at first from substantially increased loans and grants from national and foreign sources, to encourage both the mobilization of resources and the equitable participation of beneficiaries.

The World Health Organization, Pan American Health Organization, and the World Bank have estimated that the Decade will require a total investment in the Region of the Americas of about US\$60 billion for the period 1979–1990 (at 1978 prices), not including costs required to rehabilitate existing systems or to combat water pollution. This is based on the fact that, depending on the type of services adopted, the projected investments required to finance water services are on the order of US\$15,000–20,000 million for urban facilities, \$4,500–6,000 million for rural ones; investments for sewerage or excreta disposal systems are in the range of \$20,000–30,000 million for urban areas, \$700–3,000 million for rural areas. Thus, total investment could range from approximately US\$40,000 million to US\$60,000 million (in 1978 prices).

To finance national projects, countries must carefully examine the funds needed to ensure that enough are available to operate, maintain, and ultimately expand services. The World Bank estimates that for the 18 largest countries in Latin America and the Caribbean, average annual investments during the 1980s would have to triple those of the 1970s in real terms to achieve targeted service levels.

More than ever before, the rule of investment practice will have to be a

simple one: to keep capital outlay at a minimum while striving toward maximum attainment of goals. Simpler yet, in the Decade framework, the least amount of money necessary should be spent in the effort to provide water and sanitation services to everyone by 1990. While these actions continue to be of critical importance, the socioeconomic climate in which they would have to be carried out has, as mentioned before, changed—so much so, as to affect adversely the likelihood of sufficient funding forthcoming either from the countries themselves or from lending and donor agencies.

It is therefore extremely important that the countries set realistic, feasible targets for their investments in the Decade. This may entail attempting for the time being less than universal coverage and lower than optimal service. In the latter regard, for example, it might be necessary for now to provide latrines rather than sewerage systems to urban-fringe settlements where such an option is technically feasible; the introduction of further improvements and more sophisticated technologies could be subsequently staged. In cases where available funding indicates a choice between the extension of services to a greater number of beneficiaries or an increased level of services to a lesser number, extended coverage should prevail.

Among the best approaches to optimize service are the rehabilitation and improvement of existing systems, especially water metering and reduction in unaccounted-for-water losses—which will allow for the extension of services to more people at a minimum cost. In short, priority should be assigned to projects that make better use of available resources. For this purpose, the selection and design of technology may need to be modified, bearing in mind the advisability of opting for least-cost solutions.

Complicating the funding problem are many factors inherent to the sector: construction of facilities entails considerable time-lags, taking at least five years to complete; the water and sanitation sector must compete for funds with other sectors of the national economy; and, to a large degree, dependence on user fees, the most reliable source of service revenue, must be assured. Moreover, systems simply will not work unless enough front-end resources are invested to strengthen the institutions responsible for them and to develop the people to man them.

Whereas funds from donor countries and lending agencies have traditionally tended to go to cover new construction of water and sanitation facilities, it must be understood that construction represents merely one phase in the provision of services. For other phases—project identification and feasibility studies and institutional and human resource development—too few external funds have been pledged. It is nevertheless impor-

tant that each country find a specific means of financing that permits the continuous development of the sector, particularly of its institutions and human resources.

The World and Inter-American Development Banks are including resources for these purposes as components of the loans they make. The focus has been on preparing institutions to assure financial self-sufficiency by generating surpluses to cover operations, maintenance, debt service, and a share of investments necessary to attract loans, thus developing sound financial policies. If urban systems are strengthened sufficiently to be self-financing, funding could then be channeled to rural areas and small towns, which are likely to continue to need subsidization.

As external sources of funding are likely to shrink, countries should develop national planning approaches that establish priorities in the sector and should prepare sound investment programs that are attractive to other sources of international financing. The overall investment program picture should replace the traditional focus on project-related matters.

National plans should project the amount of funds that will be needed each year to attain increments of the overall Decade goals and should specify what amounts should be allowed for construction, operation and maintenance, and rehabilitation. Even without a completed plan, however, some projects will require immediate attention; these should be identified, and the necessary actions taken to acquire enough capital outlay. Sufficient funding to meet Decade goals implies a program package of projects that have been properly structured and evaluated in order to be financed. This, unfortunately, has not always been the case.

One way to increase domestic investments in projects would be the raising of sector savings; this will be possible only through the establishment of sound tariff policies. One of the persistent constraints to development of the sector is the fact that governments are reluctant to authorize tariff increases—even to keep pace with inflation or to cover the costs of consumption by those income groups that can afford to pay.

And if the poor who cannot pay cash for services are to have access to them, the countries should consider water rate policies that apportion costs equitably, so that those with higher incomes pay higher rates. The establishment of equitable tariff structures and the adoption of a commercial approach should help make it possible for urban systems to be self-sufficient and for rural facilities to meet operation and maintenance costs.

Countries that have been most successful in supplying water and sanitation services are those that have budgeted them increasing amounts of money, that have had firm policies and mechanisms of generating funds

from many sources, and that have managed to maintain a cash flow for long-range plans. Sector financing through traditional arrangements—government appropriations, taxes, and internal and external loans—have already proved insufficient to cover costs, and will assuredly be insufficient to meet the goals for the Decade. New sources of financing must be identified and tapped, including special taxes, bonds, revolving funds, private donations, and community contributions in the form of funds, labor, and materials. Once those sources have been tapped, the levying of reasonable and adequate charges on users of the services has accounted for their success and continuity.

In cases of limited funding—e.g., donor grants as compared to large loans for major construction—investment in activities for community health workers might be more effective, such as the provision of health education, the promotion of community participation, and the development and utilization of small systems technology. Communities can match that funding by contributing to projects in kind or money, thus reducing capital, operation, and maintenance costs.

Finally, it should be borne in mind that international finance and technical cooperation agencies set policies and carry out programs at the request of countries, in accordance with their expressed priorities. Governments should therefore assure that those priorities reflect the aims of the Decade, allocating a larger proportion of external funding to finance water supply and sanitation projects. This becomes even more critical as it is increasingly realized that, overall, funds will be in critically short supply in the 1980s.

Role of the Pan American Health Organization

PAHO gives high priority to cooperating with the governments in support of their efforts to obtain funds for water supply and sanitation program development. That cooperation includes carrying out and periodically updating analyses of the sectoral situation in the countries; identifying priority projects that require external financing with an emphasis on water supply and excreta disposal programs in rural areas and sanitary sewerage in urban areas; providing advisory services on the technical components of project proposals for extrabudgetary funding; and conducting studies of the criteria used in the Region for the design of water and sewerage systems and resulting in recommendations to the countries of the most appropriate technical-economic criteria to adopt in order to

achieve simple, low-cost projects that are easily operated and maintained and that utilize adequate technology.

The Organization will also make a diagnosis of the Region-wide situation regarding operation and maintenance of water supply and sanitation systems in order to identify, along with the countries, technical areas critical to reducing the loss of unaccounted-for water and the break-down of systems. On the basis of the above-mentioned diagnosis a series of technical training manuals will be elaborated, published, and disseminated in the countries. Another activity is the holding of regional workshops to provide training in the identification and preparation of sector investment project proposals.

ANNEX NO. I

GUIDE FOR FORMULATION OF NATIONAL PLANS FOR THE INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE (1981-1990)

Purpose and Use of the Guide

The purpose of this guide is to suggest—primarily to the National Action Committees for the Decade in the countries where the WHO-PAHO/GTZ (Gesellschaft für Technische Zusammenarbeit of the Government of the Federal Republic of Germany) Cooperative Project is being carried out—an orderly system for the formulation of national plans for drinking water supply and sanitation (sewerage and waste disposal).

The guide is flexible, so as to allow for changes and additions that may be required for the formulation of a detailed plan that embraces all the complementary aspects needed to expedite the programming, financing, works execution, operation, maintenance, and administration of services. It should respond to the Decade's goal of providing reliable drinking water and sanitation services to the entire population by 1990, if possible, and give priority to underserved and economically disadvantaged population groups, such as inhabitants of rural and urban-fringe areas. The plan should also be an integral part of national economic and social development planning.

The countries may find it necessary to strengthen or reorganize the sector's institutions and to heighten its managerial capabilities in order to accelerate the installation of water supply and sanitation services and ensure that they are utilized, operated, and maintained as efficiently as possible.

In establishing National Action Committees for the Decade activities, the countries should assign them responsibility for evaluating sector development, provide them guidelines for pertinent Decade policies, and foster national sector planning.

The plan should set realistic goals to maximize coverage in accordance with the objectives of the Decade. It should guide the identification and preparation of priority investments and support programs as a basis for obtaining the necessary financing. The support programs could include: development of institutional and human resources; health education; community participation, including the involvement of women in every phase of service delivery; information systems; appropriate technology; water quality surveillance; development of water resources; and others.

As soon as the plan has been formulated, execution should begin immediately through implementation of policies and strategies, timely negotiation for external financing for investment projects and the execution of support programs. Loan applications should include financial provision to carry out such support programs.

Finally, it should be recognized that planning is an ongoing and dynamic management process requiring constant monitoring, evaluation, adjustment, and updating.

The guide itself follows.

CONTENTS

1. *INTRODUCTORY ELEMENTS*

Title, authors of the plan, and the exchange rate for local currency in respect to the United States dollar.

List of abbreviations, summary of the work performed in preparing the plan and justification of the plan.

Index and contents of the plan.

2. *SUMMARY OF THE PLAN*

Summarize the principal elements of the plan, including its objectives, goals to be met by 1990, priority programs, scheduled investments for accomplishing its goals, financing, and any other items deemed pertinent.

3. *REFERENCE FRAMEWORK OF NATIONAL SECTORAL PLANNING*

3.1 *General Information about the Country*

Include summarized information about the following:

3.1.1 *Geography and Climate*

Area, topography and type of terrain, distinctive geographic regions, seasons, maximum and minimum temperatures, areas subject to floods, drought, and other major natural phenomena (earthquakes, landslides, etc.).

Characteristics of climate, seasonal variations, regional situation, etc.

3.1.2 *Water Resources*

Rainfall and runoff of rivers and other bodies of water, with emphasis on resources of possible use to the sector, including information on groundwater and its utilization, groundwater characteristics, and salt water intrusion.

3.1.3 *Population*

(The national official information supplied by the institutions responsible for demography and biostatistics should be used).

Total population. Census data for at least two preceding periods and projections for the Decade, including the growth rates adopted and the source thereof.

Regional distribution of the population.

Socioeconomic groups.

Concentrated and scattered urban and rural population, broken down by segments, strata, or other subclassifications used in the country.

Definition of urban and rural populations showing their distribution in the geopolitical divisions (departments, states, provinces, cantons, districts, towns, villages, etc.) in accordance with normal practice in the country.

Population data and sex and age composition.

Population growth rates.

3.1.4 *Economic Aspects*

Income.

Per capita gross domestic product for 1980; structure of the GDP; other economic indicators, and regional variations.

Welfare profile. Characteristics and location of low-income groups. Percentage of population living in extreme poverty.

Employment and unemployment. Main occupations of urban and rural population, with regional variations.

Housing: composition and conditions; availability.

3.1.5 *Development*

Situation of economic sectors, such as agriculture, industry, mining, irrigation and hydroelectric power generation, other energy resources and the uses made thereof, and communications. Postal, telegraph and telephone systems, highways, railroads, air and river transportation, etc.

3.1.6 *Education*

Extent of literacy. Enrollment ratios and other indicators. Primary, secondary, and university education. Population attending, and average number completing school. Brief description of educational system.

Vocational education. Describe.

3.1.7 *Public Health*

Country's health situation; indicators. Principal prevalent diseases. Water-borne and water-related diseases and those resulting from deficient sanitation.

Morbidity rates

Birth rate per one thousand inhabitants

General mortality rate per one thousand

Infant mortality per one thousand live births

Mortality rate for children aged 1-4

Life expectancy at birth

Investments in public health; the amount thereof as percentage of national expenditures; proportion allotted to water supply and sanitation.

3.2 *Planning and legal frameworks*

3.2.1 *History of Planning*

Description of the country's overall development planning, the institutions responsible, coordination mechanisms, and planning periods. Description of the country's major economic and social development plans and programs currently in progress and those scheduled for the 1981-1990 period, showing the part assigned in each to the water supply and sanitation sector, and the action that can be taken in other sectors to contribute directly or indirectly to the attainment of the objectives of that sector (intra and intersectoral linkages).

3.2.2 *Analysis of Legislation affecting the Sector*

3.2.3 *International Drinking Water Supply and Sanitation Decade*

National commitment to the Decade.

3.3 *Diagnosis*

3.3.1 *Analysis of the Sector*

Summary history of the development of the water supply and sanitation sector.

National coverage for the years 1960, 1970, 1975, and 1980:

Urban Water Supply (by segments or strata)

Population served through house connections..... %

Population served through public standposts

(easy access)..... %

Total population served..... %

Rural Water Supply (by segments or strata, including dispersed population)

Population served through house connections.....	%
Population served by public and individual sources (easy access).....	%
Total population served.....	%

Total Coverage (urban and rural)

Urban Sanitation (by segments or strata)

Population served by connections to sewer system....	%
Population served by septic tanks, latrines, etc.....	%
Total population served.....	%

Rural Sanitation (by segments or strata including dispersed population)

Population served by sanitary disposal of excreta....	%
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<i>Total Coverage</i> (urban and rural).....	%
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Describe the situation of the urban-fringe population. Indicate the major cities involved and include estimates of the population receiving no service.

Characteristics of water supply and sanitation services in urban and rural areas.

Institutional structure of the sector: identify the different institutions that participate in the sector, grouping them by principal functions, such as global and sectoral planning, project management and others (identification and preparation of projects and execution and control of works), administration, operation, and maintenance of systems.

Brief description of interrelationships (governmental, functional, regulatory, etc.) among the various institutions and between them and the community, and assessment of their compatibility and complementarity in the different spheres of action (urban, urban-fringe, and rural) and at the levels at which they operate (national, regional, metropolitan, local, etc.) in relation to the goals of the Decade. Also a diagnosis of the communication media and information systems used for those interrelationships and of the monitoring and evaluation of execution of sector plans.

For each institution, evaluate the managerial capacity, and the institutional purposes and goals in relation to results, and determine the compatibility thereof with the goals and purposes of the Decade; the available resources (financial, physical, human, technological, and informational), and the organization established for their operation.

Human resources: indicate their availability in the sector, their num-

bers, and their attrition (losses in each staff category), and existing training institutions and programs. See pp. 74-77 for details.

Material and equipment resources. Brief description of the national industry supplying the equipment and materials used by the sector, indicating the extent to which needs are satisfied.

Imported materials and equipment as a relative percentage of the total.

Technology. Description of technologies in current use to provide services and how those technologies affect costs.

National and international financial resources. Summarize in tabular form investments made in the sector for the years 1970-1975 and 1980, broken down by national and external sources. Indicate the following: present policies and financing mechanisms; criteria used for subsidies; criteria governing payment for the use of services; rate policies; loans in negotiation.

3.3.2 *Determination of constraints on the sector's development*

Priorities, alternative courses of action.

3.3.3 *Prognosis for the Sector*

Demographic trends: urban, urban-fringe, concentrated rural, and dispersed rural for the years 1985, 1990, and 2000.

Trends in the provision of water services and financing if current practices continue.

4. *NATIONAL DRINKING WATER AND SANITATION PLAN (1981-1990)*

4.1 *Policies*

Indicate the sectoral and intersectoral policies that will govern action during the Decade.

4.2 *Objectives*

General

Specific

4.3 *Goals*

Goals for 1990. Drinking water supply and sanitation; urban and rural (concentrated and dispersed rural); and for the country as a whole.

Intermediate goals.

4.4 *Strategies for Extension of Coverage*

Describe the proposed measures that will be applied for:

4.4.1 Optimization of installed capacity and expanded services

- 4.4.2 Improvement of water quality
- 4.4.3 Development of institutions and their human resources
- 4.4.4 Community participation
- 4.4.5 Increase in production and supply of goods and services
- 4.4.6 Sanitary education
- 4.4.7 Intersectoral coordination and participation
- 4.4.8 Application of appropriate technologies
- 4.4.9 International cooperation
- 4.4.10 Financing of the plan (economic and financial criteria)
 - Mobilization of resources
 - Optimized application of resources
 - Rate criteria and recovery of cost of services
 - Criteria for community participation and contribution
 - Criteria for assignment of subsidies (intra and intersectoral)
 - Criteria for allocation of resources from the national budget
 - Criteria for channelling of external resources
- 4.4.11 External Technical Cooperation

4.5 *Institutional Structure for the Plan*

The conclusions reached in the assessment of the sector's institutional structure and the proposals and adjustments required in the proposed plan should serve as the basis for strengthening of the structure and for establishment of the objectives, functions and resources, the organization of institutions in the sector, their communication, and information media machinery for coordination and interrelations.

4.6 *Programs*

4.6.1 *Investment Programs for the Decade*

In each instance, show the profile, priority, and costs of identified projects; total investment, with national and external components.

Drinking water supply and sanitation in:

- Urban areas (by segments of population if necessary)
- Urban-fringe areas
- Rural areas of concentrated population (by segments of population if necessary)
- Rural areas of dispersed population

4.6.2 *Support Programs*

Describe the proposed support programs, subprograms and projects at both the national sectoral level and that of the executing institutions, indicating their objectives and strategy; methodology and organization; development stages contemplated; anticipated results; resources considered; costs and financing methods; external cooperation required; and agencies for technical and financial cooperation, among others.

If the programs were formulated during preparation of the plan, give additional details of the elements listed above. The information on pp. 74-77 should be used as a guide to the categories of participating institutions and staff in the case of human resources.

- Program for Development of Institutions and Human Resources
 - Subprograms:
 - Operations
 - Projects and Works
 - Operation and Maintenance
 - Commercial System
 - Administration and Development of Human Resources
 - Support Administration
- Community Participation Program
- Health Education Program
- Water Quality Monitoring and Surveillance Program
- Appropriate Technology and Research Program
- Program on Research and Development of Water Resources, particularly underground water

NOTE: In addition to the contents of items 4.6.1 and 4.6.2, it is suggested that the information concerning identified projects and programs be summarized in accordance with the outline on pp. 78-82. This information will facilitate negotiation of the external support required, since copies of these data sheets can be made available to international and bilateral agencies interested in providing technical and financial support to the plan.

5. *INVESTMENT PLAN AND OPERATING COSTS*

Based on the above itemization of the costs of the investment projects and programs needed to support attainment of the goals, consolidated tables should be prepared for the sector as a whole, broken down by institutions, population segments, and urban and rural settings. The additional population slated for coverage during each year of the period should also be indi-

cated, both for drinking water through household connections and public standposts, and for sewerage and excreta disposal.

This information must be supported by a statement of the criteria by which the costs of the project were determined or the overall estimates made to serve the population for which detailed information is not yet available. The corresponding hypothesis used in adopting unit costs of construction, for production, operation, maintenance, administration, and debt service (amortization and interest payments) should be made explicit.

To calculate total estimated costs—including those for investment and support, administration, operation and maintenance—a projected statement of sources and uses of funds should be prepared for all the years of the decade, at the national level and broken down by institutions, and showing the type of source (internal funds, national budget, domestic or external loans).

6. *EXECUTION OF THE NATIONAL DRINKING WATER AND SANITATION PLAN*

6.1 Describe the mechanisms for integration of the plan into the total economic and social development planning.

6.2 Describe the processes that must usually be followed for the execution, adjustment, and control of the plan, as elements of sector management.

7. *EXPECTED RESULTS OF EXECUTION OF THE NATIONAL DRINKING WATER SUPPLY AND SANITATION PLAN IN IMPROVING THE WELL-BEING AND HEALTH OF THE POPULATION*

7.1 Indicate the improvement in well-being and reduction and control of water-borne diseases expected to result from implementation of the plan, and in relation to the initial health situation. It is suggested that particular attention be given to any distinctive regional situations.

7.2 Describe the process whereby executing agencies receive instructions on the areas of responsibility assigned to them under the National Plan; the procedures within each executing agency for the planning, execution, adjustment, and control of the programs entrusted to them; and the ways in which those programs in the institutions are connected with and supervised under the national plan.

8. *METHODOLOGY FOR EVALUATION AND MONITORING*

8.1 Description of the methodologies provided in the plan for the compilation, recording, classification, and processing of data.

8.2 Description of the methodology for analysis and utilization of the information processed.

- 8.3 Preparation and adoption of the indicators and schedule for evaluation and monitoring of the plan.
- 8.4 Determination of the procedures for general adjustment and updating of the plan.

DIAGNOSIS OF HUMAN RESOURCES

Provide the following information for each executing institution:

GROUP A. PLANNING AND MANAGEMENT

	Number Available	Annual Attrition Rate (%)	Expected Attrition Number
Sanitary Engineers			
Civil Engineers			
Mechanical Engineers			
Electrical Engineers			
Chemical Engineers			
Health Inspectors			
Public Health Doctors			
Chemists			
Biologists			
Physicists			
Toxicologists			
Hydrologists and Hydrogeologists			
Planners			
Economists			
Statisticians			
Administrators			
Sociologists			
Ecologists			
Architects			
Lawyers			
Accountants			
Other			

GROUP B. TECHNICAL PERSONNEL—ALL CATEGORIES

	Number Available	Annual Attrition Rate (%)	Expected Attrition Number
Sanitary Engineers			
Civil Engineers			
Chemical Engineers			
Mechanical Engineers			
Public Health Inspectors			
Chemists			
Biologists			
Physicists			
Toxicologists			
Hydrologists and Hydrogeologists			
Economists			
Statisticians			
Administrators			
Plant Operators			
Laboratory Technicians			
Construction Foremen			
Surveyors			
Draftsmen			
Well Drillers			
Teaching Supervisors			

GROUP C. SKILLED PERSONNEL AND WORKERS

	Number Available	Annual Attrition Rate (%)	Expected Attrition Number
Work Crew Foremen			
Mechanics			
Electricians			
Plumbers			
Guards			
Equipment Operators			
Chauffeurs			
Masons			
Carpenters			
Painters			
Gardeners			
Unskilled Workers			
Other			

GROUP D. ADMINISTRATIVE AND OFFICE PERSONNEL

	Number Available	Annual Attrition Rate (%)	Expected Attrition Number
Water Meter Readers			
Billing Personnel			
Auditors			
Warehousemen			
Secretaries			
Typists			
Bookkeepers			
Administrative Assistants			
Other			

GROUP E. COMMUNITY-BASED PERSONNEL

	Number Available	Annual Attrition Rate (%)	Expected Attrition Number
Health Promoters			
Sanitation Aides			
Teaching Assistants			
Public Health Nurses			
Social Workers			
Other			

NOTE:

The annual rate of attrition or loss of personnel should be calculated in percentage form. Estimated figures may be used. The expected number will be that obtained by relating the attrition figure with the number of those now employed.

For each education and training institution and program, supply the following information:

On Educational Institutions

- Types of programs
- Content of programs
- Installed capacity
- Limiting factors

- Admission requirements
- Degree awarded to graduates

On Training Institutions

- Types of programs
- Content of programs
- Installed capacity
- Limiting factors
- Admission requirements

8. *DURATION:*

9. *STARTING DATE:*

10. *SUMMARY OF ESTIMATED PROJECT COSTS:*

Foreign	Local	Total
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11. *TENTATIVE FINANCING PLAN:*

(i) Requirements

(ii) Sources

12. *FINANCIAL STRATEGY:*

13. *SECTOR DEVELOPMENT PERFORMANCE:*

14. *OUTPUTS:*

- (iv) State and describe existing studies (indicating title and year) as well as date, information etc. available relevant to the project.
6. *Responsible Government Agency* Indicate exact name and address of Government agency responsible for the implementation of the project and to which correspondence should be directed.
7. *Institutional Support* (i) Describe existing and expected support for operation and maintenance of systems. Also indicate whether funds have been earmarked for operation and maintenance of systems once they are built.
(ii) State if project will operate on cost-recovery basis. If not, indicate who will pay for the recurrent costs and to what extent.
(iii) Indicate the type of organization and management available for project implementation.
8. *Duration* Expected duration of project. Duration of each phase if applicable.
9. *Starting Date* Tentative timing for the start of the project. Also indicate what actions will indicate the start of the project.
10. *Summary of Estimated Project Costs* Estimate total costs in US dollars for the project and for each major project component. Indicate proportions of component and total costs to come from foreign and from local sources. If project is a pre-investment or direct support project rather than an investment project, indicate the following:
- Local Inputs* (i) Personnel: State number and designation of counterpart national staff assigned to project. Indicate if possible, their background, experience, etc. and the support they can provide to project.
(ii) Equipment and supplies: Indicate vehicles, equipment, etc. allotted to project.
(iii) Funds: Specify Government contribution to project, in cash and kind in US dollars.
- Foreign Inputs* (i) Personnel: State number, background, and field of expertise required of foreign experts, consultants, etc. with man months in each case.
(ii) Equipment and supplies: Indicate if any equipment and supplies are to be provided from external sources.
(iii) Funds: State amount of external funding required in US dollars.

11. *Tentative Financing Plan* (only for investment projects)
(i) Requirements: The total financing required for the project, comprised of the total estimated project cost and the working capital needed.
(ii) Sources: Indicate sources of the total financing required, from sector agencies responsible for the project, from external agencies and from the Government.
12. *Financial Strategy* (only for investment projects)
(i) Describe plans and a timetable for meeting operating, maintenance and debt service expenses of the project once it is completed.
13. *Sector Development Performance*
(i) Indicate and name how many similar or related projects have been implemented.
(ii) State what Government support has been given to sector development.
14. *Outputs*
(i) State the nature of studies that will come out of the project. Also improvement in the institutional aspects etc.
15. *Government Priority and Commitment*
(i) Indicate if project is included in Government development plan and country program.
(ii) Indicate degree of Government priority and commitment to project.
16. *Expected Benefits*
(i) Indicate total population that will be served as a result of the project. Also what groups will be the beneficiaries (type of consumer, hospitals, industry, etc.)
(ii) Indicate expected improvement in health and socio-economic conditions.
(iii) Indicate personnel (number, types, etc.) expected to be trained as a result of project and improvement in local sector manpower situation.
17. *Prepared by* State name of official who completed the data sheet or provided the relevant data for its completion.