

ORGANIZATION OF WATER SUPPLY AGENCIES IN THE AMERICAS¹

Oscar Terrevazzi²

This article deals with water supply and sewerage agencies in the Americas, local and national bodies, laws and recently enacted legislation, and recently established funds.

INTRODUCTION

Purposes

The purpose of this article is to examine in very general terms the organizational structure of water supply agencies in Latin America.

Any structure, whatever its nature, exists to serve a given purpose; it is therefore impossible to go very far with this subject before being faced with the problem of compatibility between ends and means.

Ambitious though it may seem, this article does hope to arouse some concern that can later be translated into constructive suggestions on policy and organization. Of course, since it is easier to identify problems than to solve them, these suggestions can only arise from painstaking, sound teamwork.

Plan and Method

Specifically, the plan adopted may be summarized as follows: (a) to examine rapidly how the institutions are organized and what progress or changes have occurred recently, without going into detail about their structure or their internal operations so as not to lose sight of the problem as a whole; (b) to pinpoint and call attention to the most

significant advances and trends; and (c) to indicate some starting points for more complete studies in this field, in the light of the goals of the Charter of Punta del Este (1961).

The article is divided into a general section, which contains only over-all data, ideas, and trends, and a special section containing details of the institutions in each country. A table based on the information provided in the second section shows the most outstanding advances in the way of new national institutions, major local corporations, and funds set up or legislation passed between 1961 and 1965 (see Table 2).

I. GENERAL

Historical Trends

Two identifiable trends may be distinguished in the policy and the institutional structure traditional in Latin American organization in this field.

1. Almost from the very beginning some countries chose to establish centralized independent or semi-independent national institutions responsible for the planning, design, construction, and operation of services. The resources came and continue to come largely from national sources. The rate schedules, which are largely the result of economic, social, and political forces, did not lead to self-financing, so that losses accumulated and continue to accumulate. The attack on water-borne diseases was successful if measured by the number of lives saved. The catalytic effect of the services on the development of the communities concerned and, by extension,

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² Director of Construction, National Sanitary Works Agency, Buenos Aires, Argentina

of the whole country was considerable as the basic social capital began to be formed. Rigorous examination shows that the "great unknown" is the cost-benefit ratio—the productivity of the funds invested in works and the absorption of operational losses. This was the case first in Argentina and Uruguay and subsequently in Venezuela, Puerto Rico, and Mexico. The Mexican policy has unique characteristics—it has tended

markedly toward regional decentralization by means of federal water boards.

2. Other countries decided on a policy based at the municipal level, either directly or through national or provincial institutions that designed and built projects and then handed them over to local agencies to operate.

Table 1, which presents, without critical analysis, socioeconomic indicators for the

TABLE 1 — Data on Area, Population, and Socioeconomic Indicators for 20 Countries of the Americas, 1960.

Country	Area (thousands of km ²)	Population (1960)			Socioeconomic indicators			
		Total (thousands)	Percentage		Rate of population growth (1955-1960)	Per-capita income (US dollars) (1955-1959) ^a	Mortality ^b	
			Urban	Rural			General ^c (1955-1960)	Infant ^d (1950-1955) (1955-1958)
Latin America								
Argentina.....	2,776.6	20,956	67.6	32.4	1.8	425	8-9	62
Bolivia.....	1,098.6	3,696	29.9	70.1	2.2	70	20-25	
Brazil.....	8,513.8	70,600	39.4	60.6	3.2	220	11-16	e
Chile.....	741.8	7,627	62.9	37.1	2.4	320	12-13	
Colombia.....	1,138.4	15,468	46.1	53.9	2.8	313	14-17	86
Costa Rica.....	50.7	1,171	37.8	62.2	4.2	319	9-13	
Dominican Republic.....								
Ecuador.....	48.7	3,030	30.5	69.5	3.2	118	16-20	e
El Salvador.....	270.7	4,317	34.7	65.3	3.2	166	15-20	
Guatemala.....	21.4	2,442	32.6	67.4	3.0	102	14-18	e
Haiti.....	108.9	3,765	31.0	69.0	2.9	183	20-24	
Honduras.....	27.8	4,140	12.6	87.4	2.2	55	20-28	80
Mexico.....	112.1	1,950	22.5	77.5	3.3	115	15-20	
Nicaragua.....	1,969.4	34,988	53.6	46.4	3.1	220	13-16	e
Panama.....	148.0	1,477	33.9	66.1	3.5	130	12-17	
Paraguay.....	74.5	1,055	41.0	59.0	2.7	250	9-13	e
Peru.....	406.8	1,768	33.8	66.2	2.5	115	12-16	
Uruguay.....	1,285.2	10,857	35.8	64.2	2.9	113	13-18	68
Venezuela.....	186.9	2,490	70.9	29.1	1.3	224	7-9	
Total.....	912.1	7,331	61.7	38.3	3.9	930	10-15	...
United States of America.....	7,997.0	174,000	1.4	>2,000	9	
Puerto Rico.....	8.9	2,300	34.0	66.0	2.4	480	8-9	54

Source: United Nations documents. Since the figures are taken from various documents, they may vary somewhat from other published figures.

... Data not furnished.

^a More recent studies have altered these figures for 1961. The new method of estimating is based on determining real income as expressed in purchasing power in U.S. dollars. The research has not yet been completed. See "The Economic Development of Latin America in the Post-War Period," United Nations, 1963.

^b Many of these data are questionable; some countries do not keep adequate and complete statistics.

^c Per 1,000 population.

^d Per 1,000 live births.

^e From 100 to 150, and in some cases higher.

^f The total population in 1962 was 210,521,000.

^g Number of inhabitants, 94,588,000.

^h Number of inhabitants, 110,323,000.

ⁱ Total rates of demographic growth: rural 1.5 per cent; urban, 4.6 per cent.

TABLE 2 — National Institutions Concerned with the Provision of Water and Sewerage Services in 20 Countries of the Americas, with References to Important Local Institutions and Laws or Special Funds of National Scope Established in the Period 1961-August 1965.

Country	1961	1962	1963	1964	1965	Planned	
Argentina	← The basic national institution: National Sanitation Works (OSN) and provincial agencies →					New regulations (Law 16.660) ^a National Service for Rural Potable Water and Sanitation ^b	
Bolivia	← Municipal organizations →				Local Water and Sewerage Service of Oruro ^c	National Water and Sewerage Corporation (CORFAGUAS)	
Brazil	← New state and municipal agencies were established →						
		National Department of Sanitary Works (DNOS) National Sanitary Works Fund ^a		Federal agencies (Special Public Health Service and others), state and municipal			
Chile	The basic national institution: Bureau of Sanitary Works, and also the Planning Office of the Public Works Ministry, the Environmental Health Section of the Health Ministry, and municipal services						
Colombia	National, departmental, and municipal institutions: National Municipal Development Institute (INSFOPAL), departmental corporations, autonomous municipal companies, and the Division of Environmental Sanitation of the Public Health Ministry						
Costa Rica	National Water and Sewerage Service (SNAAB) ^b	← The Division of Sanitary Engineering of the Public Health Ministry and the municipal services → that have not been transferred to SNAAB					
Dominican Republic		National Institute of Potable Water and Sewerage (INAPA) ^b		National Rural Water Service (SNAR) ^b			
Ecuador	Department of Sanitary Works of the Public Works Ministry, agencies of the Health Ministry, and municipal services: municipal companies or cantonal boards. No national agency						Ecuadorian Institute of Sanitary Works
El Salvador	National Water and Sewerage Administration (ANDA) ^b	← Division of Sanitary Engineering of the Public Health Ministry and municipal services → not yet transferred to ANDA					
Guatemala	National Municipal Development Institute (INFOM), Special Public Health Service, National Water Supply Committee, Water Supply and Sewerage Department of the Public Works Ministry, and municipal services						
Haiti	← Hydraulic Services of Haiti →				Autonomous Metropolitan Water Supply Service (CAMEP) ^c		

Country	1961	1962	1963	1964	1965	Planned
Honduras	National Autonomous Water and Sewerage Service (SANAA) ^b	←—Division of Environmental Sanitation of the Health Ministry and municipal services not yet transferred to SANAA—→				
Mexico	The basic structure: Ministry of Hydraulic Resources, National Mortgage and Public Works Bank, Federal Potable Water Boards, Ministry of Health and Welfare, Federal District services, and municipal services					
Nicaragua	National Department of Municipal Services of the Ministry of Development and Public Works, Ministry of Health, autonomous "water companies," and municipal services. No national agency					
Panama	National Water Supply and Sewerage Institute (IDAA) ^b	←—Department of Public Health of the Ministry of Labor, _____→ Social Welfare, and Public Health, and services not yet transferred to IDAAN				
Paraguay		National Sanitary Works Service (SANOS) ^b	Asunción Sanitary Works Corporation and programs of the Health Ministry with cooperation of international agencies. No other municipal services			
Peru	Arequipa Sanitation Corporation ^c	Lima Sanitation Corporation ^c Rural Sanitation Law ^a (in the charge of the Special Public Health Service)	Suboffice of Sanitary Works of the Ministry of Development and Public Works, National Economic Development Fund, Special Public Health Service, National Housing Institute, municipal services, and other departmental agencies			National Sanitation Institute
United States of America: Puerto Rico	←—Water and Sewerage Authority—→					
Uruguay	Basic national institution: State Sanitation Works Administration (OSE). In the rural area, the Public Health Ministry works in cooperation with the Geological Institute and OSE. Sewerage service in Montevideo is under the Department of Engineering and Works of the City Council					
Venezuela	Basic institutional structure: National Institute of Sanitary Works (INOS), Rural Waterworks Division of the Ministry of Health and Social Welfare. Coordination is the responsibility of the Hydraulic Works Council					

^a Laws or special funds of national scope.^b New national institutions.^c Important local agencies.

countries that chose large-scale national institutions, risks implying that the results achieved in the field of sanitation are directly related to the policy and institutional organization of those countries in the matter of water supply. Actually the question is much more complicated, since these results must be evaluated in the light of complex geographic, political, economic, sociological, cultural, and ethnic conditions. Theoretically, however, it seems fairly obvious that these large national agencies are suitable means for coping with the problem of water supply in Latin America.

Basic Institutional Structures: Major Events, 1961-1965

From a hemisphere-wide standpoint the institutions in this field fall into two main groups: the international and the national.

International and Bilateral Institutions

In this group the most important agencies are the Pan American Sanitary Bureau (PASB), the United Nations Children's Fund (UNICEF), the Agency for International Development (AID) of the United States, and the Inter-American Development Bank (IDB). The International Bank for Reconstruction and Development (World Bank) and the Export-Import Bank are also active in this field, though somewhat differently.

Each of these agencies has its own mode of operation and its own field of action. UNICEF gives preference to activities in small rural communities and provides supplies and equipment. AID gives technical and financial assistance to larger localities. PASB provides advice and assistance in all matters related directly or indirectly with the subject. The IDB has been increasingly active in recent years, furnishing financial support for projects and studies directed toward the economic development of the region, as have the World Bank and the Export-Import Bank.

These international and bilateral agencies have central bodies for planning, manage-

ment, and coordination; their operations are handled by regional centers with branches in the countries or provinces or individual country agencies. These activities are always channeled through national institutions by means of agreements with the governments. Together these agencies constitute a vast network for providing technical, financial, and administrative assistance and, because of their stability and continuity, play an important role in the development of policies and plans for water supply. What characterizes them is the vastness of the effort and their sense of hemisphere-wide solidarity.

National Institutions

Table 2 shows that the most outstanding advances since 1961 are these:

1. Nine new national agencies have been established to deal with water supply problems in the urban and rural areas of eight countries (Argentina, Bolivia, Costa Rica, the Dominican Republic, El Salvador, Honduras, Panama, and Paraguay).
2. In three countries (Bolivia, Ecuador, and Peru) plans to change existing national agencies or to establish new ones are well advanced.
3. Three sizable local autonomous corporations have been established, in Oruro (Bolivia) and in Arequipa and Lima (Peru) and several state and municipal corporations have been created in Brazil, which also set up the National Department of Sanitary Works in 1962.
4. Despite their not being actual organizations, mention should be made of the establishment of a National Sanitary Works Fund in Brazil and the Urban Sanitation Fund of the Buenos Aires Area in Argentina, because of their impact in this field. Also worth mentioning is the approval of the Rural Sanitation Law in Peru and of Law 16660 of Argentina, which updates the statutes of the National Sanitation Works Agency.

Table 2 shows that 1961 and 1962 were marked by significant structural and legal advances; that 1963 was not remarkable for any significant change; and that 1964 and 1965 saw a further movement forward. This chronological statement does not necessarily have anything to do, one way or another, with

developments in plans and programs; these are discussed briefly in the special section of this article.

Recent Trends and Patterns of Development

A look at each country individually reveals, though imperfectly, certain trends and patterns that will be described below with no attempt at a systematic presentation. The word "recent," it should be pointed out, is not meant to limit the discussion to the period 1961-1965 since some trends date from before the Charter of Punta del Este.

In countries that have traditionally been centralized, the trend has been toward greater participation by the provinces and municipalities in the design, financing, construction, and operation of services. This is true, for example, of Argentina. The statutes of some recently established national institutions illustrate this trend by delegating certain executive functions, particularly the operation of services, to regional or local bodies. They also provide for the establishment of departmental or state branches and of local water boards or committees. However, planning, coordination, technical advisory services, management of water resources, and the supervision of water quality remain vested in national agencies.

In countries that originally followed a policy of delegating the provision of services to the municipalities, the present trend is just the opposite. The central national body is taking over responsibility for all aspects of these services in order to improve their efficiency. Still, some of these countries are also endeavoring to set up local water boards or committees, particularly in smaller communities, to operate and manage water installations with the supervision and advice of central or regional agencies. Community development and educational programs are being conducted, with technical assistance and advice from international organizations, to promote self-management and self-financing.

There is also a trend toward including representatives of property owners and professional institutions on the governing boards of some national bodies.

New central agencies or major local corporations are often designated "autonomous," but with few exceptions this autonomy is not absolute, especially in matters of obtaining and administering finances and setting rate schedules.

The services of medium-sized and large communities tend to remain or to be placed under national agencies attached to the ministries of public works, whereas rural areas are served by agencies of the ministries of public health. The former usually have more of the experience, funds, and manpower needed for urban projects.

The sources of financing, traditionally national in an overwhelming proportion, are changing. Although national funds may be increasing in absolute terms, a larger relative share now comes from the provinces and municipalities and from the population served; in addition, international financial assistance is being requested and received, particularly from the IDB.

Throughout the region there is a marked trend toward self-financing. It is expressly provided for in the statutes of practically all the new agencies. Countries that have traditionally applied public-works policies aimed at promoting health and development are moving toward a balanced budget. Some of them are not only covering their operating costs, but also obtaining income for amortization, by restructuring or raising charges to meet present-day costs. In addition, more and more meters are being installed as a way of applying rates that contribute to self-financing, but are also socially valid.

Many plans and programs have been worked out and put wholly or partially into effect. They are nearly always part of national development plans that take their cue from world-wide trends and from the Charter of Punta del Este.

Attempts are being made to improve internal operational structures and administrative procedures and to introduce the institutions to modern figuring and accounting methods. Many such programs are being carried out with assistance from international agencies and consulting firms.

National and state governments are placing increasing emphasis on training professionals, technicians, and administrative personnel. They are supporting educational institutions and promoting congresses and conferences. For their part, international agencies are actively providing all sorts of assistance, technical and financial, by supplying research equipment and material, fellowships, training courses, and other services.

The Environment and Its Socioeconomic Infrastructure

As a region, Latin America has its own particular characteristics. Its estimated population in 1962 was 210 million, and its population growth rate of 2.8 per cent a year is one of the highest in the world. The rural population, which is widely scattered and poor in resources, exceeds the urban. But the urban population is growing faster, which makes for an increasing demand for services. Conditions in the countries (Table 1) vary considerably, as do the geographies. Argentina has very different problems from Haiti, and Brazil from Puerto Rico; hence different solutions are called for.

Illiteracy ranges from 14 to 89 per cent and infant mortality from 54 to 150 per 1,000 live births or more. General mortality is high—13 to 15 per cent. The population is young, and for every 100 members of the labor force there is an average of 84 dependents. Per-capita income in the region, which was 250 to 300 dollars in the period 1955–1959, rose by 2.7 per cent annually during the period 1945–1955, but since then this rate has fallen to 1 per cent. Complex internal and external factors are involved in this stagnation. In at least 10 of the republics, income and the most significant

socioeconomic indicators are below the average. Differences in income between the rural and the urban sectors are marked; what is more, income is distributed regressively, both over-all and within each sector. Social stratification is still very marked in many countries; in those with a sizable middle class, its leaders and members lack drive. The socioeconomic structures are generally rigid.

Of the region as a whole, it may be said that there has been a marked urban expansion, but little modernization and industrialization. The institutional infrastructure is usually weak and archaic. There is more horizontal than vertical mobility. In some countries the social policy is more advanced than the economic structure. In others, inflation is playing havoc with the family budget and coloring attitudes toward national problems; it has also given rise to a type of entrepreneur who is an imitator and a speculator rather than a true producer.

This vast and complicated backdrop to the policies, goals, institutions, and programs launched under the Charter of Punta del Este must not be lost sight of. As is well known, furthermore, it is practically impossible to draw up sectoral plans without making them part of national plans. The task is difficult and complicated; it calls for leaders, officials, and technicians with, among other things, a great deal of flexibility, ability, perseverance, understanding, and solidarity.

General Trends of Present Policy

Both at the international and at the national level, there seems to be an awareness that balanced development depends on integrated economic and social planning and that heavy public investments in health and education are essential to stimulate the process of development while private enterprise concentrates on other sectors of production. That this is so is proved by the scope of the financial support and technical-administra-

tive assistance operations in the field of basic sanitary works and by the interest shown by national governments.

The general course at the highest level thus appears to be the right one. The question of compatibility between ends and means must now be briefly examined. This requires something more than the presentation of a few statistics and trends.

An Outline of the Institutional Situation

Between the consumers and the policy makers stretches a great variety of organizational structures, bodies, and factors involved directly or indirectly in the provision of water.

Political Structures

Latin American political structures do not seem to have achieved as yet the degree of maturity and modernity demanded by development. There is social consciousness, of course, but in the field under discussion there is usually a lack of basic information about the nature and the complexity of the problems. Often the easy way out is chosen—a desire for potable water is aroused, but no thought is given to the means necessary for satisfying that desire. The technicians take a positive attitude toward many problems on which the politicians are skeptical. Myths and panaceas abound, such as believing that problems can be solved by laws or utopian plans, and there is a tendency to “idealize the goals” in drafting plans and setting up agencies. Fortunately, there are a few modern, practical leaders concerned about the common good.

The whole question is so sensitive that it is very difficult to suggest ways of turning leaders toward specific, practical objectives. Perhaps the best way is the classic one: high-level conferences, travel to acquaint themselves with results achieved elsewhere, full information, and so on.

National Career Technicians

The range is wide. Side by side with officials and technicians rooted to their old formulas and therefore difficult to change, there are younger enthusiasts promoting measures unsuitable to the environment in which the problems are to be solved. Transplanted policies and techniques do not produce the same results in all environments. Postgraduate courses within the countries and a wealth of internationally sponsored fellowships, seminars, meetings, regional conferences, publications are spreading knowledge and attitudes that will help in the search for more balanced solutions. Much remains to be done.

Unfortunately, there are no financial incentives to improve and enlarge the pool of technicians needed for reaching the goals of the Charter of Punta del Este. Only too familiar are the “brain drain” and the shift of sanitary engineers to fields offering more incentives and higher prestige. Concerted action by educational institutions, professional associations, and international agencies might be a good way of obtaining this necessary manpower. Many studies have been made to ascertain the shortage of sanitary engineers; the time seems to have come for action, on a regional scale.

Planning Structures

The attitude toward planning, as a modern instrument for organizing work, is on the whole favorable. Most of the countries in the area have drawn up development plans that naturally include plans for water supply. What matters, however, is that the scope of the plans should be commensurate with the goals set and that the funds and manpower for achieving them be available. In the field of water supply, the “idealization of goals” is common.

Unfortunately, the statistical and information infrastructure needed for the preparation of technically sound plans is defective in many countries. The training of officials

in programming methods appears to be setting matters on the right track. No doubts exist about the need for national water supply plans, with special attention to rural areas. Sometimes, in the passion for planning, the organizational, financial, and technical resources available for carrying out the plans are not evaluated or are over estimated. As a result, plans and programs often degenerate into mere lists of projects with budget estimates, timetables, number of persons to be served, but no serious estimates of costs or socioeconomic benefits.

Specific Organization Structures

The new institutions, funds, and laws that have come into being since 1961 hold out great promise. Also favorable are the changes going on in the old central agencies of several countries.

But spectacular results are not to be expected in a short period of time. It is not easy to create cadres of technical and administrative personnel, or to obtain the resources needed to set them on a sound basis and protect them from extraneous influences. Technical solvency and efficient procedures depend on experience, continuity, and incentives, among other things. Bearing in mind the general picture that has been sketched, it is easy to see that the obstacles to be overcome are not small.

The development process is getting strong, with continuing support from a team of trained specialists and advisers from international agencies. Educating the local community for self-sufficiency is perhaps the winning card, and work is being done in this field. Tocqueville said that "it is man that builds kingdoms and creates republics; the community appears to come directly from the hands of God." Even in the age of electronics and space travel, community cohesiveness and solidarity seem to be the basic pillars of the whole institutional structure of services, especially in rural areas.

Consumers and Consumer Education

If the municipality and the water board are the first level of organization, the consumer is the keystone. His attitude toward potable water is primitive. He believes in free water because he has been taught to believe in it; he confuses charges with taxes; he is afraid of the meter; he wastes water because he does not understand its economic and social value; and he resists having to pay for water what it costs and what it is worth.

The average Latin American consumer has not been educated in self-government and self-financing. He acts under various pressures: from the leader who promises him services; from the official who talks to him of plans, programs, costs, and rates; from Duesenberry's "demonstration effect," which leads him to invest in radios or television sets at the expense of potable water. Thus public services are the orphan of production. The average consumer takes the price of conspicuous consumption in his stride and rebels against water rates, so that sometimes it is easier to sell a perfumed soap than the water necessary for its use.

In brief, any investment in the education of the consumer will bring maximum results. Just as we have come to understand that it is more sensible to supply potable water than to cure typhoid fever, we must ask ourselves whether it is not more sensible to start giving the future consumer a sense of community and social solidarity while he is in primary school than to force policies and structures upon him when he has become an untaught adult.

It should not be forgotten, on the other hand, that the income level of most of Latin American rural communities is extremely low and that complete self-financing is a luxury they cannot afford. Recent sanitation programs in rural areas have been based on local contributions appropriate to that level.

The establishment of stable, efficient, and adequately endowed educational and pro-

motional agencies operating at all levels and on a large scale seems essential, along with the development of plans and programs and with the strengthening and modernization of institutions and agencies.

II. SPECIAL SECTION

This part of the report contains a few basic data—only those necessary for indicating trends—on 20 countries in the Hemisphere and the Commonwealth of Puerto Rico. It is thus a mere outline, which may be a basis for more detailed studies.

There has been no time for surveys, and the incompleteness and haphazardness of the information is recognized. No critical examination has been made of the institutions and their structures, nor has any evaluation been attempted. The defects in the arrangement of the data are due to the heterogeneous nature of the material available.

Plans, programs, loans, population, and communities to be served are mentioned only incidentally, to give some idea of the activities being carried out by various institutions and agencies. Rarely are data given for 1965. Since the work of PASB, UNICEF, AID, and IDB, conducted by means of agreements with the governments, covers all of Latin America, it is not always mentioned specifically or in detail under the headings for the individual countries.

The main sources of information have been material gathered during a trip through several South American countries undertaken by the author in 1960 together with Dr. Miguel Brunet Bengochea and Mr. Hugo C. Albertelli; similar material furnished by Zone VI of the PASB and its officers; and reports and publications of this organization, of the IDB, and of the United Nations.

Argentina

The first water supply projects in Buenos Aires were inaugurated in 1869 by a commission that subsequently became the General Bureau of Sanitation Works and, in July 1912, the National

Sanitary Works (OSN). The National Sanitary Works Agency (its present name) is an autonomous government agency subordinate to the Ministry of Public Works and Services. It is responsible for practically the entire national policy on water and sewerage. This policy may be summarized as follows:

a. Under Law 13577, which created the OSN, the municipalities delegate to it the planning, financing, construction, and operation of services, but may recover them under conditions stipulated in the law.

b. Until a few years ago the funds came almost entirely from national sources (bonds or the general revenues).

c. Operations are technically and administratively centralized; there is no intermediate regional or provincial structure.

d. The rates, which are uniform throughout the country, are based chiefly on "non-metered water" for domestic purposes; the rest is metered. The owner, not the user, pays the charges.

The relative rigidity of this system has been eased in the past 10 years, in the following ways:

• *Financing.* To improve or establish service, joint financing contracts are signed with the provinces or municipalities, which between 1956 and 1964 contributed 820,000,000 pesos.

• *Projects and construction.* OSN is still in over-all charge, but nowadays the municipalities often take charge, with the advice and supervision of the central bureau.

• *Extension of water and sewer services.* Since 1956 this has been up to the potential users, either directly or through the municipalities.

• *Rate schedules.* Rates have been raised in such a way that since 1961 the budget has been balanced with respect to industrial operation. Since the rates are uniform, in some places it has been possible to pay off accumulated operating deficits in full and build up surpluses that are used for new construction in those areas.

• *Organization and administration.* Many secondary functions have been delegated to the local services, but the fundamental ones remain in the hands of the central offices.

As of 31 December 1964, the OSN was providing potable water to 9,200,000 persons; was responsible for 489 water and sewer works, and had some 17,000 agents. In accordance with the National Development Plan, the OSN has drawn up a program for 1965-1969 that calls for the investment of 36.5 billion pesos (about US \$210,000,000), to be financed as follows: public credit, 68 per cent; charges and profits, 10 per cent; provincial and municipal contributions, 9

per cent; National Lottery, 2 per cent; and IDB loans, 11 per cent.

Other provincial and municipal agencies also operate in this field. Some of these have considerable experience, but the intermediate institutional structure is not yet sufficiently developed.

Operating in the rural area, which in general is quite different from that of other regions of Latin America, is the Bureau of Environmental Sanitation of the Ministry of Social Welfare and Public Health. Until recently this agency has had very little experience with rural water supply. In cooperation with the PASB, however, it has carried out programs of basic rural sanitation, chiefly in the Provinces of San Juan and Chaco.

The latest modifications in Argentine policy have been as follows:

- Establishment of the Urban Sanitation Fund for the Buenos Aires Area (Law 16437 of 20 December 1961), to finance major basic water and sewerage work. It will be made up of a 10-per-cent tax on the fees for service in the area and of contributions from Buenos Aires Province and from the municipalities that make up the metropolitan area. By the end of 1965 the fund, which is administered directly by the OSN, will amount to 640,000,000 pesos. The construction plan includes projects amounting to about 10 billion pesos. In October 1964 the IDB granted a \$5,500,000 loan for a large filtered-water pipeline for the southern area.

- Issuance of regulations for Law 16660 (26 February 1965), under which water and sewerage works may be built and operated under conditions different from those specified in the OSN organic law. The studies and projects may be drawn up either by the OSN, by the provinces, or by the municipalities; construction will remain the responsibility of the OSN, but the municipalities or provinces will be in charge of operations. The OSN will advise and will continue to control water for drinking. The resources will come from national, provincial, and municipal contributions from external or domestic loans and from 30 per cent of the sums collected under Law 14578, which allocates part of the National Lottery income for water and sewerage projects.

- The National Service for Rural Potable Water and Sanitation (SNAP), established in December 1964 in the Ministry of Social Welfare and Public Health, will be in charge of promoting, supervising, and administering water supply and sanitation projects in communities of up to 3,000 inhabitants. Its work will be coordinated with that of the Ministry of Public Works and Services through the OSN, which will furnish technical advisory services. Projects and works

will be handled by the provinces under the supervision of the SNAP, the OSN, and the IDB, and the financing will be divided as follows: nonreimbursable national contributions, 20 per cent; nonreimbursable provincial contributions, 10 per cent; community contribution (in cash, materials, or labor), 20 per cent; IDB loan, 50 per cent.

The funds for these programs will make up a national revolving fund, as suggested by the PASB, which participated actively in the establishment of the SNAP. The regulations for the SNAP have already been promulgated (Decree 3995 of May 1965), and 10 agreements have been reached with provinces.

In August 1965 a loan agreement was signed with the IDB for \$5,000,000 to finance the first stage of these programs, which call for a matching domestic contribution and will benefit 400,000 persons. This stage is to be carried out over a 30-month period dating from the signing of the first loan. The total IDB credit for rural water is \$20,000,000.

Bolivia

Originally the provision of water and sewer services was the responsibility of the departmental prefectures and the municipalities. In 1961 a national economic and social development plan was formulated for the period 1962-1971, and one of its provisions was that potable water should be provided to all communities of more than 2,000 inhabitants. In January 1962 the Bolivian Sanitary Works Administration was established. This is an autonomous agency charged with planning and carrying out water supply and sewerage projects for the entire country, its activities and resources to be coordinated with those of the municipalities.

The Administration conducted its first activities of coordination, data collection, and planning in 1962; with technical assistance from the IDB it financed a survey of aqueducts for La Paz, Oruro, Cochabamba, and Santa Cruz and of the water and sewerage systems under the authority of the Bolivian Mining Corporation. The long-range plans call for projects in Sucre, Potosí, and Tarija.

About 25 per cent of the investments were to be made by the Bolivian Government and the municipalities. The "Ingeniería Global" group, set up under a multilateral agreement between the Governments of Bolivia, the United States, of America, West Germany, and the IDB, has set forth legal, financial, and administrative measures for each project that will make

it possible to establish autonomous municipal agencies to run the services. In addition, with the cooperation of AID, smaller projects were drawn up to provide drinking water to 43,000 persons in 14 communities. The local contribution in these projects comes to 50 per cent of the costs.

To deal with basic sanitation in places with less than 10,000 population, the creation of the National Water and Sewer Corporation CORPAGUAS has been planned. The Corporation would negotiate external and internal loans for cities that have autonomous water and sewerage agencies; and it would set up semiautonomous agencies in other cities and supervise their operations.

The Local Water and Sewerage Service of Oruro has been established to operate the city's new water system, which will be constructed with the financial cooperation of the IDB. A \$2,600,000 loan was granted in April 1965.

Brazil

In general, Brazilian water supply services are municipal; often they are autonomous, although state or federal technical and financial cooperation is provided on the request of the municipalities.

In brief, the system has three levels:

• *National or federal level.* The Special Public Health Service Foundation (SESP), which is part of the Ministry of Health, is responsible for supervising the technical, financial, and administrative aspects of the water and sewerage projects carried out by the states, municipalities, and joint enterprises. In many cases the Service also does the construction. It is particularly active in the less developed areas. In 1962 the National Department of Sanitary Works was established in the Ministry of Roads and Public Works and the National Sanitary Works Fund was set up with funds comprising 2 per cent of the federal fiscal revenues. The National Department of Rural Endemic Diseases and the National Bank for Economic Development have also worked in this field.

• *Intermediate level.* The state agencies participating in the supervision and surveillance of the services are generally the sanitation offices of the departments of public works or of health.

• *Local level.* The municipalities manage the service themselves, often with state or federal cooperation.

In recent years a trend has been noted toward self-financing, rationalization, and the formation of autonomous agencies; rates are adjusted in accordance with minimum-wage levels.

With respect to the goals of the Charter of Punta del Este, the Government Program for Economic Action envisages an investment of 359

billion cruzeiros (90 billion in the period 1964-1966) in the National Water Supply Plan. The National Sewerage Plan is expected to provide service to 30 per cent of the urban population by 1973, with internal funds exclusively.

Federal investments in water and sewerage have been channeled in various ways: directly through the National Department of Sanitary Works; through funds for regional development plans such as SUDENE (Superintendency of Development of the Northeast); by agreements with states or municipalities; or by way of investments of the Special Public Health Service Foundation or the Ministry of Health.

In 1964 between 24 and 29 billion cruzeiros were invested in water supply and sewerage projects. Programs financially assisted by the IDB represent an investment of more than US \$107,000,000. The IDB contribution exceeds US \$43 million.

Chile

The General Bureau of Potable Water and Sewerage Services dates from 1931. In July 1953 it was united with the Hydraulics Department of the Bureau of Public Works to form the Bureau of Sanitary Works, a semiautonomous agency in the Ministry of Public Works responsible for the planning, construction, and operation of national services and the supervision of those privately or municipally owned. For some years the plan has been to make it a state enterprise so as to give it "more flexibility and authority" and, more recently, to attach it to a Ministry of Housing.

The funds for its work come from the national budget, derived from taxes on the properties served; from specific allowances for certain works; from funds collected under the General Law of Urbanization and Construction; from contributions under the "Copper Law," which establishes a special tax earmarked for public works; and from contributions from the Housing Corporation and other agencies. Its rate policy is set to cover at least operating costs.

In 1962 the Planning Office of the Ministry of Public Works prepared a Minimum Sanitary Works Program with a view to meeting the goals of the Charter of Punta del Este. It calls for investments of 348,000,000 escudos for the provision or improvement of water and sewerage services in urban and rural areas except for towns of under 1,000 population. For its part, the National Health Service, established in 1952, prepared the Basic Rural Sanitation Plan, from which stemmed a two-year plan aimed at benefiting 852,000 inhabitants of 276 communities.

The services will be built with financial contributions from the local communities. All these programs are currently under way.

The IDB has lent US\$3,520,000 to help finance the Minimum Program and US\$2,500,000 for the two-year plan. It has also furnished US\$5,125,000 for major basic water supply projects in Santiago.

Colombia

The first water supply projects in Colombia were mainly in the cities. Subsequently a central agency was set up to take charge of all pipeline and sewerage matters except in the eight largest cities, which have their own agencies.

The basic structure in this field consists of the following agencies:

- The National Municipal Development Institute, an autonomous agency established in 1950 and reorganized in 1957, which plans, finances, and builds projects in places that do not have sufficient resources of their own and promotes the formation of branches known as water and sewerage corporations. The various departments and municipalities put funds of their own into these, and the Institute is the major shareholder. Municipalities that already have services may participate in the corporations by turning over their installations in exchange for shares. The resources of the Institute come from 50 per cent of the tax on domestic distilled liquors and from the national, departmental, and municipal budgets. In 1963 nearly 500 municipalities—more than half of the total number—were associated. The Institute operates mainly in medium-sized cities. The government contributions and, as a result of better and more strictly applied rate structures, revenues have increased appreciably in recent years.

- Autonomous public or private agencies serving the eight largest cities: Bogotá, Barranquilla, Cali, Medellín, Bucaramanga, Cartagena, Cúcuta, and Manizales. With appropriate advice on financing and rate structures, these enterprises have confronted the task of improving and expanding their services, receiving help from government contributions and external loans. Cali and Cúcuta received loans of US\$2,454,000 and US\$5,183,000, respectively, from the IDB in 1961 for the improvement of their water services and AID furnished US\$1,350,000 to Cali for the extension of its sewerage system.

- The Ministry of Public Health, which, through its Division of Environmental Sanitation, designs and builds water supply systems for communities of under 1,000 inhabitants. The beneficiaries contribute cash, materials, and labor.

As part of the General Development Plan the National Municipal Development Institute, with the cooperation of the Inter-American Cooperative Public Health Service (SCISP) and the Ministry of Public Health, drew up a 10-year (1961-1970) plan for water and sewerage that calls for expanding the existing systems and installing new ones throughout the country. The plan will require a total investment of 1,613,000,000 pesos and consists of a short-range (1962-1965) and a long range (1961-1970) program. In 1962 the IDB granted a loan of US\$8,500,000 to help finance the short-range program; the money will be used for projects in more than 300 urban centers that will serve a population of about 3,000,000. At the end of 1963 the IDB had approved 50 subprojects.

The Bogotá Water and Sewerage Company has also undertaken to expand and improve services, by means of bond issues, the establishment of special taxes, and a rate structure based on self-financing.

Costa Rica

The National Water and Sewerage Service (SNAA) was created in April 1961 and took over functions in the design, construction, operation, and control of potable water services, both urban and rural, that had been the responsibility of various agencies, among them the Ministries of Public Health and of Public Works, SCISP, the Municipality of San José, and other municipalities.

The specific objectives of the SNAA, which is semiautonomous, are "to administer, direct, plan, design, construct, maintain, determine, and resolve all matters related to the provision of potable water for domestic, industrial, and other uses to all the inhabitants of the Republic." It was formed by merging the Department of Hydraulic Works of the Ministry of Public Works and the Department of Sanitary Engineering of the Ministry of Public Health.

The SNAA governs all matters concerning water supply and sewerage and storm sewers throughout the country; sets priorities for these services; approves all projects; builds and operates installations of its own and takes charge of others when municipalities so request; controls the use of water resources essential to its purposes; and sets rates for the public services covered by its charter. The law creating it provides that the rates for water and for waste disposal shall lead to self-financing and make possible the expansion of the services.

In the first phase of its development the SNAA had to give priority to services for the San José

metropolitan area. For this purpose it obtained a US\$3,500,000 loan from AID and a US\$4,500,000 loan from the Export-Import Bank in 1962. Subsequently it received a government contribution of US\$362,840 and, in 1963, a US\$953,800 loan from AID to proceed with the new Río Blanco system—a project that later had to be suspended because the sources were seriously affected by the eruptions of the volcano Irazú.

In 1963 the SNAA received from the IDB a technical assistance loan of US\$100,000 for water and sewerage studies in various places, and in 1964 it approved a plan calling for the construction of 80 water systems, serving 131 rural communities, during 1965–1966. The cost, which is estimated at US\$2,000,000, is to be covered by contributions from the local communities and governments (26 per cent), the central government (15 per cent), and external loans (59 per cent). FAO will collaborate by providing basic foods equivalent in value to 50 per cent of the daily wage of the local labor in the communities that will be served.

At the end of 1964 the SNAA had taken over 10 urban and 38 rural services and had 8 under construction. It had obtained a loan from the United Nations Technical Assistance Fund for ground-water surveys.

Dominican Republic

Originally, potable water supply was the responsibility of the Division of Hydraulic Resources of the Ministry of Agriculture.

In July 1962 the National Institute of Potable Water and Sewerage (INAPA) was created. This is an autonomous agency whose purpose is to deal with national water and sewerage problems and whose functions include planning, surveys, construction, administration, and operation.

In 1963 INAPA carried out several projects in the urban centers in the interior, and in 1964 it built water systems for 15 rural communities, completed improvements to the water and sewerage systems of the city of Santo Domingo, and continued work on a number of water and sewerage systems in the Provinces of Barahona and San Rafael. At the end of 1963 it received a US\$1,150,000 loan from the IDB for improving the water systems of the cities of La Romana and San Pedro de Macorís and installing systems in Pimentel, Castillo, and Hostos. The PASB advised INAPA on the drafting of a progressive rate schedule that will make it possible to finance the program while taking into account the ability of the communities served to pay.

Since February 1964 rural water supply has been handled by the National Rural Water Serv-

ice (SNAR), which is part of the Ministry of Health and Social Welfare. SNAR is governed by an Administrative Council composed of the directors of the National Health Service, the Environmental Sanitation Division, and INAPA plus two members appointed by the PASB and UNICEF. The Minister of Health and Social Welfare serves as chairman. The executive directorship is joint, consisting of a national official appointed by the Government and an international official designated by the PASB. The resources of SNAR will come from national revenues, from private contributions, from the communities to be served (which may choose whether to contribute in cash, in materials, or in labor), and from external loans and grants.

SNAR is in charge of “the study, planning, financing, design, construction, and administration of potable water supplies” in communities of up to 2,000 inhabitants. At the local level it is required to promote active participation by the communities in both financing and administration. UNICEF and the PASB are cooperating closely in these programs of rural sanitation.

Ecuador

The Ecuadorean provinces are divided into cantons, and the cantons into urban and rural parishes; thus the authorities of the canton have jurisdiction over the urban and rural centers in their area. For lack of a national agency with broad authority and resources to handle the problems of basic sanitation, they are attended to chiefly by the municipal councils, which build and operate services. Their public resources come from rates and from taxes on certain products, and the Central Government makes special contributions.

In Quito, Guayaquil, and Manta there are autonomous or semiautonomous agencies. Quito has the Municipal Potable Water Company, established in May 1959, which has a balanced budget and also holds jurisdiction over the rural areas of the canton. To overhaul and extend the water system, the Quito Company received two loans, totaling US\$7,650,000, from the Export-Import Bank. Sewerage service in the city of Quito and the rural communities of the canton are the responsibility of the Municipal Department of Works and Regulatory Plan, which in June 1962 received a US\$3,000,000 loan from the IDB to pay 76 per cent of the cost of a program to extend and improve the Quito sewers and to build services in 15 rural parishes.

In Guayaquil the Cantonal Water Board has been in operation since 1959, with authority also over the rural parishes. With a population

of more than 500,000, Guayaquil lacks an adequate waste-disposal system. To draw up an over-all plan to solve this problem will cost the municipality US\$452,000, of which 41 per cent will come from its own resources and the rest from an IDB loan granted in August 1964.

At the national level is the National Sanitary Engineering Department, which has promotional, planning, and control functions. There is also SCISP, which operates under an agreement between the Ecuadorean and United States Governments and is financed by both countries. SCISP works chiefly in rural areas. In 1961 it carried out a survey to determine the potable water and sanitary needs of 155 localities, and since 1963 it has been conducting and administering a program to construct and improve 15 water systems and 4 sewerage systems that will serve 160,000 inhabitants in 18 communities. The total cost of the program is US\$6,224,000, of which 88.4 per cent will be covered by an IDB loan approved in October of that year. The Government has committed itself to setting up a national agency or regional bodies to operate and administer the new services, and to charge rates that will cover at least the operating and maintenance costs.

These objectives have been included in the Potable Water and Sewerage Program of the General Plan for Economic and Social Development, drawn up in 1963. The program envisages the investment of 1,812,000,000 sucres, with 57 per cent external financing, to meet the goals of the Charter of Punta del Este in this field. It also calls for the establishment of the Ecuadorean Institute of Sanitary Works.

El Salvador

The National Water and Sewerage Administration (ANDA), established in October 1961, is a central autonomous institution whose basic objective is to "provide and assist in providing all the inhabitants of the Republic with water supply and sewerage, through the planning, financing, execution, operation, maintenance, administration, and exploitation of the necessary and appropriate works." Its legal, financial, and operational attributes are very broad, although its rates, charges, and fees are subject to the consent of the Ministry of Economy and must be approved by the Legislature. Its rates must "be set with a view not only to its being a self-liquidating enterprise, but also to rendering a public social service" and must cover all the direct and indirect costs of constructing and operating the services, including expansion.

The basic holdings of the ANDA are made up

of water and sewerage services legally transferred to it by municipal and state agencies without repayment. At the end of December 1964 ANDA held 45 such services.

The terms of its charter contain specific norms for expenditures, investments, and amortization, with a view to self-financing. Article 75 of the law states that "ANDA shall provide no service free of charge."

ANDA's activities began with the formulation of a national plan for urban water supply and sewerage (1962-1965) designed to provide service to 725,000 persons in 80 localities, the first stage to benefit 39 communities. The IDB approved three loans totaling US\$4,800,000 for the plan, the first stage of which was 75 per cent completed by June 1964. The second stage began early in 1964; it covers the construction or expansion of water systems in 99 communities. At the same time the first stage of the Ten-Year Rural Sanitation Program, to benefit another 68 communities, was under way. The IDB approved a US\$4,400,000 loan for the two plans.

Guatemala

Water and sewerage services are generally in the hands of the municipalities, which receive technical and financial assistance from the Central Government through the Ministry of Public Health and Social Welfare and the Ministry of Communications and Public Works.

The following agencies operate in this field: the Water Supply and Sewerage Department of the Ministry of Public Works, which plans and builds the systems; the Special Public Health Service (SESP) of the Ministry of Public Health and Social Welfare, which has sole jurisdiction in rural areas through its Department of Sanitary Engineering; and the National Municipal Development Institute (INFOM), an autonomous agency that provides technical and financial assistance to the municipalities and also supervises the systems built by the other two agencies in cases where municipal contributions have been made.

To plan and coordinate all these activities and set priorities, the National Water Supply Committee was created in February 1960, with representatives from the two Ministries, SCISP, and INFOM. At the end of 1961 the Committee completed a program comprising the construction or expansion of potable water systems in 63 communities and the execution of 53 sewerage projects.

For the rural area the SESP prepared in 1963 a plan to supply 156 communities and benefit

91,500 persons, and in 1964 it was drafting long-range plans aimed at supplying potable water to a population of 1,000,000 in the period 1965-1974. To finance the programs of the first two years a loan of US\$500,000 was requested from the IDB.

To improve, expand, or install water services in 74 communities and sewerage in 38 others, the IDB granted INFOM two loans totaling US\$6,520,000. These programs, together with those undertaken by INFOM with domestic resources, are in progress. A review of the rate schedules in various municipalities was started. A plan was being drawn up to provide sanitary services to all urban centers. The Government was carrying out educational campaigns aimed at the creation of local water boards or committees.

Haiti

Hydraulic Services of Haiti, an executive agency created in 1958, has been in charge of all water supply services in the country. According to PASB estimates, only 2.5 per cent of the population had household water in 1961.

Attempts to give Haiti a semiautonomous agency in charge of all water and sewerage matters began in 1961, when the Committee for Potable Water Studies was set up to prepare a national plan.

With assistance from AID and the cooperation of the PASB, a project was drawn up in 1962 for expanding and improving services in Port-au-Prince and Pétionville. It called for technical and financial assistance from the IDB.

In 1963 it was established by law that "the harnessing and disposition of water are a privilege of the State." These powers have been exercised since then by Hydraulic Services of Haiti, which is now attached to the Ministry of Public Works, Transportation, and Communications and has charge of all matters pertaining to the country's water supply systems.

Since May 1964 the planning, operation, and administration of water services for Port-au-Prince, Pétionville, and the surrounding communities has been the responsibility of a new independent agency called Autonomous Metropolitan Water Supply Service (CAMEP). Its holdings will be composed of all the installations in Port-au-Prince and Pétionville that were formerly under the jurisdiction of Hydraulic Services of Haiti; it will have the right to harness and distribute any water resources essential to its objectives and will set rates on the self-financing principle.

This institutional progress enabled the IDB to grant a US\$2,360,000 loan in March 1964 to

finance the first stage of an over-all water improvement plan for the metropolitan area. It also assigned US\$190,000 for advisory services in administration, operation, accounting, and training. Once a start has been made on basic sanitation for the metropolitan area—in which only 38 per cent of the population has household water service—the planning and construction of rural water systems can begin.

Honduras

SCISP has been operating in Honduras since 1942. Up to the middle of 1961, in cooperation with the Government, it had designed, built, and turned over to the municipalities more than 150 water systems and more than 20 sewerage systems. These systems are to be transferred to the National Autonomous Water and Sewerage Service (SANAA), established in May 1961. At the moment SANAA operates only 12 water systems.

This new, centralized autonomous agency, with jurisdiction over the entire country, is in charge of promoting, designing, constructing, operating, maintaining, and administering all water and sewerage services. Article 47 of the law creating it states categorically that SANAA "may not provide water or sewerage services gratis in any form."

In 1963 AID signed an agreement with the Government for the construction of 24 rural water services with an AID contribution of US\$1,000,000. The loan was approved in 1964 and the program is under way. The plan will be extended to 86 more rural communities with a US\$1,500,000 loan from the IDB, currently being negotiated. UNICEF is contributing US\$125,000 in materials and equipment.

To help finance a program covering six urban centers, the IDB granted SANAA a US\$400,000 loan in October 1964. In March 1963 the Bank had issued another loan, of US\$2,150,000, for the expansion and improvement of the Tegucigalpa water supply service.

Also operating in Honduras, on a smaller scale and through SANAA, is the Cooperative for American Relief to Everywhere (CARE), which has built four small water systems. In coordination with the Ministry of Health, the PASB has cooperated with SANAA on programs to supply water to small rural communities, on aspects of organizing and financing, and on campaigns to interest and motivate the community.

Mexico

The institutions in charge of water supply in Mexico are the following:

•The Ministry of Hydraulic Resources, established in 1946, which has jurisdiction over the entire national territory except the Federal District. The Federal Sanitary Engineering Law, promulgated at the end of 1947, declares the planning, designing, and execution of water supply and sewerage projects to be of public utility and confers these functions on the Ministry when the projects are being carried out with federal funds or a government guarantee. In the field of basic sanitation the Ministry operates through its Central Water and Sewerage Department, which must allow local authorities to participate in the design, execution, and maintenance of the services.

•The Federal Potable Water Boards, local decentralized agencies formed and renewed under regulations approved in 1949. Their function is to operate and administer services turned over to them by the Ministry of Hydraulic Resources. In rural areas the work of these boards is handled by Potable Water Committees, in which case the Ministry's activities are channeled through its Department of Rural Works.

•The National Mortgage and Public Works Bank, an autonomous institution established in 1933 and empowered to issue loans to the local boards after technical and economic studies of the projects.

•The Ministry of Health and Welfare, which since 1961 has been in charge of a twenty-year plan to supply drinking water to all communities of less than 2,000 inhabitants.

•Some of the municipalities, chief among them the Federal District.

Under this system, 2,319 projects (excluding those in the capital), benefiting 10,125,000 persons, had been constructed up to 1964, all through the Ministry of Hydraulic Resources. Up to August 1963 the Ministry of Health and Welfare had built in addition 576 systems, serving a million persons, and had completed 502 public baths and laundries. Since 1962 the Government has been promoting the establishment and development of regional commissions to carry out regional basic sanitation programs in the capacity of decentralized agencies of the Ministry of Hydraulic Resources.

IDB support in Mexico began in 1962 with a US\$9,200,000 loan for the partial financing of 12 potable water systems and a sewerage system in Yucatán, part of a 15-year plan to develop this region, which has suffered serious socioeconomic deficiencies. The projects will be carried out by the Ministry of Hydraulic Resources and administered by a special body with headquarters in Mérida.

In March 1965 the IDB approved another loan, for US\$4,824,000, to help expand and improve water and sewerage services in the cities of Querétaro and Durango. The borrower is the National Financing Agency, a government institution responsible for negotiating and contracting external credits. The Ministry of Hydraulic Resources will carry out the project.

The Mexican policy is directed toward decentralization, local administration, and self-financing.

Nicaragua

Between 1950 and 1956 the design and construction of water and sewerage services in Nicaragua were in the hands of SCISP.

Since then these functions have been carried out by the National Department of Municipal Services, a central body with jurisdiction over the entire country except Managua. It was originally part of the Ministry of Development and Public Works, but in June 1963 it was transferred to the Ministry of Interior. This body builds and operates municipal services, sets and collects charges, and spends or invests funds as necessary. It is also supposed to act as a central support agency for the expansion of urban and rural water systems. Both in Managua and elsewhere there are autonomous "water companies" that operate the systems with their own resources.

With the help of AID the Nicaraguan-American Technical Cooperation Organization has been set up; it collaborates technically and financially with the Department of Sanitary Engineering of the Ministry of Public Health on rural sanitation and on ground-water surveys.

In 1963 an agreement was signed between the Ministry of Public Health and the PASB for the programming, designing, and construction, in a two-year first stage, of 54 water systems, chiefly in rural areas. An external contribution of \$1,000,000 is called for, but the carrying out of the plan appears to depend on a reorganization of the central agency.

By the close of 1964 significant progress had been made; 49 communities, not counting Managua, had potable water service, whereas there were only nine in 1953. With financial assistance from the International Development Association, the Managua Water Company was well advanced on the third stage of an expansion plan costing \$6,000,000.

A team of PASB advisers stationed in Guatemala is cooperating with the Nicaraguan agencies, providing technical assistance in sanitary

engineering, organization, financing, and community development.

Panama

In 1953 the water and sewerage services of Panama City and Colón, which until then had been built and administered by the Canal Zone authorities, passed to the Government. They became the responsibility of the Water and Sewerage Commission of the Sanitary Engineering Division of the Ministry of Labor, Social Welfare, and Public Health.

Small water supply projects have been carried out in rural areas by SCISP in cooperation with the Ministry.

The National Water Supply and Sewerage Institute (IDAAN), an autonomous government agency, went into operation on 1 January 1962. The new agency, which replaced the Commission, has "all functions related to the planning, investigation, design, direction, construction, inspection, operation, maintenance, and improvement of water and sewerage systems in the Republic." Rates and other charges must be set and amended in such a way as to cover at all times the costs of operation and maintenance and the amortization and interest on bonds and loans. The law expressly prohibits IDAAN from providing service gratis, but it is charged with "finding a just and realistic formula for a socially sound tariff."

IDAAN operates chiefly in urban areas. In 1964 it completed the program that had been agreed upon by the Water and Sewerage Commission and the International Cooperation Administration and was working on new programs for water and sewerage in the metropolitan area and a number of towns in the interior. Besides its own resources, it was using funds from the IDB (US\$2,762,000), AID (US\$6,000,000), and the Chase Manhattan Bank (US\$1,000,000). IDAAN's policy has been the total rehabilitation and modernization of existing services and the construction of new ones, with socially appropriate rates based on self-financing and the use of meters. At the end of 1963 there were 63 communities with water service, and 13 of these had sewers.

In 1964 IDAAN drew up a four-year plan to expand urban water services and benefit a population of 130,000. For rural water systems a coordinating committee was established, with representatives of the Ministry of Labor, Social Welfare, and Public Health, IDAAN, and the PASB. The first stage of the program covers 30 communities. IDAAN will execute it, the PASB

will provide advisory services, and financial help from the IDB was expected.

Paraguay

In August 1959 a potable water system in Asunción, operated by the Asunción Sanitary Works Corporation, was officially opened. In November 1964 this system was serving about 40 per cent of the city's population—130,000 out of a total of 330,000. This is practically the only such service in the entire country, which in 1964 had a population estimated at 1,900,000.

In June 1962, the National Sanitary Works Service (SANOS) was established, its basic function being "to promote the development of public water systems and the construction of sanitary and/or storm sewers throughout the country, putting them within reach of the communities served under a strictly self-financing system . . ." SANOS is responsible for formulating the National Sanitary Works Plan for Potable Water and Sewerage; drawing up annual works plans; controlling the water resources necessary to its objectives; setting rates; applying and regulating charges and fees, with a view to self-financing; and supervising all public or private water and sewerage services in the country except those of Asunción.

In November 1964 SANOS prepared and published a national water supply plan, on which the PASB and AID had collaborated, and early in 1965 the Ministry of Public Health and Social Welfare drew up the agency's first budget.

The national plan has been split into long-range and short-range phases. Their provisions may be very briefly summarized as follows: (a) *Ten-Year Plan*: population to be served, 1,053,400, in 12 communities of 5,000 to 20,000 inhabitants, 139 communities of under 5,000, and scattered settlements; SANOS would be responsible for projects in the 151 largest communities, and the Ministry of Public Health and Social Welfare for the scattered settlements, through its Division of Environmental Sanitation; cost of SANOS projects, US\$8,639,000, to be financed 70 per cent by external loan, 15 per cent by the Central Government, and 15 per cent by the municipalities and communities; (b) *Two-Year Plan*: population to be served, 66,200, in three communities of 5,000 to 20,000 inhabitants and 12 of under 5,000; anticipated investment, US\$1,867,000, with 70 per cent external financing.

While SANOS was in the process of establishment, the Ministry of Public Health and Social Welfare carried on programs for rural water supply. During the period 1959–1963 it drilled

1,322 wells at health centers, schools, markets, and other public places, benefiting 130,000 persons. Technical, financial, and administrative assistance and advisory services were provided, beginning in 1958, under agreements with the PASB, UNICEF, and AID. The total contribution of the international organizations to basic sanitation came to US\$312,000; the Government contributed within its means as called for in the agreements.

The Action Plan for 1965-1966 envisages 75 wells with pumping equipment and public taps, 425 wells with hand pumps for rural dwellings, the rehabilitation of 450 existing wells, and 4,175 inspections of water supplies.

In 1964 the Asunción Sanitary Works Corporation was reorganized and the water and sewerage systems of Asunción were extended. During 1965-1966 it is planned to lay 149 kilometers of water pipeline, 12 kilometers of sewer, and a network of storm sewers.

An agreement between SANOS and the IDB signed in April 1965 will help to finance a study by consultants of the organization and administration of SANOS and advisory services on seven water supply projects in the interior. The IDB contribution is estimated at US\$65,000.

Peru

The Peruvian institutional structure for water supply and sewerage is complex. The following agencies are at present operating in this field:

- The Suboffice of Sanitary Works of the Ministry of Development and Public Works, a non-autonomous agency whose purpose is to plan, build, operate, and control the majority of the country's services.

- The National Economic Development Fund, set up in 1957, which supervises, through its Sanitation Division and in cooperation with the Departmental Public Works Boards, the programs of the latter. This agency works in urban and rural areas under three different plans: the Regular Plan, which includes new projects and the expansion of water and sewerage systems in towns up to the district-capital level; the Plan for the North and Northeast; and the Over-all Sanitation Plan, for household water and sewerage installations in various cities. The Fund combined resources from national and municipal budget allocations and special taxes.

- The Department of Sanitary Engineering of the Special Public Health Service of the Ministry of Public Health and Social Welfare, which is in charge of water quality for public supplies and

has the responsibility for services in rural communities of under 2,000 population.

- The National Housing Institute and the National Housing Corporation, which build supplementary sanitary installations in some urban areas that lack services. The Cuzco Development Corporation, the Puno Development Corporation, and the Callao Board of Public Works do the same.

- The municipalities, which administer services not run by the Central Government.

- The Arequipa Sanitation Corporation, an autonomous agency responsible for the city's general sanitation plan and having jurisdiction over the entire department of the same name.

- The Lima Sanitation Corporation, also autonomous, in charge of administering, operating, and maintaining the city's water and sewerage systems.

The National Fund, the Suboffice of Sanitary Works, and the Special Public Health Service have drawn up and partly carried out various plans to provide water and sewerage to a number of urban and rural communities. In a recent study the Suboffice estimates that a medium-range plan for the urban sector would require an investment of US\$12,000,000 a year. For rural areas, the 1962 Rural Basic Sanitation Law laid the bases for building water and sewerage systems in communities of under 2,000, setting standards for determining the cash and labor contributions to be required and the rates to be applied. The Basic Plan for Rural Sanitation envisages providing potable water to 3,000,000 country people in the next 10 years at an estimated total cost of US\$56,000,000.

In 1962 the Department of Junín, with the cooperation of UNICEF and PAHO/WHO, initiated a five-year over-all sanitation plan that includes the provision of potable water and latrines to 18 rural communities. In March 1964 the IDB granted a US\$1,650,000 loan to help finance a program for supplying water to 150 rural communities (150,000 persons).

The Arequipa Corporation received an IDB loan of US\$3,900,000 in 1961, and the Lima Corporation, which has sizable resources of its own, received from AID and the Export-Import Bank a total of US\$15,100,000 for its program for the metropolitan area.

In the interest of having a national agency, the Peruvian Senate has approved a bill creating the National Sanitation Institute. This body will plan and coordinate all water and sewerage programs, thereby giving the country an institutional structure adequate to its plans for urban and rural basic sanitation.

Puerto Rico

Water and sewerage services in the Commonwealth of Puerto Rico are handled by the Water and Sewerage Authority, established in 1945 and legally constituted in 1949 for the purpose of taking over all water supply and sewerage systems in Puerto Rico and seeing to their operation and expansion. The Authority may issue bonds; contract for projects, goods, and services; appoint personnel; and set its own rates.

The Authority has jurisdiction over the entire island irrespective of political boundaries. Almost all its basic activities are centralized, and it is managed practically as a private corporation with its own internal controls. Its highest authority is a five-member governing board. Once a year its operations are examined by the Commonwealth Comptroller.

Although the Authority received government contributions during its early years, nowadays it manages successfully through the issuance of tax-exempt bonds, which are redeemed solely from its revenues.

The rates are uniform throughout the island. They are considered "low enough to be within reach of the mass of the population and high enough to cover all costs of operation and bond service."

All water is metered; even the water in public fountains is paid for by the Government. Under no circumstances may the Authority provide water free—this is prohibited in the law creating it. Metering is held to be the best system on which to base charges. The early difficulties have been overcome, and the cost of installing meters on a large scale is considered a sound investment, not an expenditure.

United States of America

Most water and sewerage systems in the United States are run by municipal agencies. However, the steady growth of large cities and satellite towns has been creating serious jurisdictional problems. When the natural area of an urban center overflows its political limits, the need arises for a unified agency to provide water and sewer services, but the separate municipalities concerned insist on retaining their local prerogatives. Still, a number of area-wide agencies have been established.

When such services stretch over several states, an interstate pact or agreement is drawn up. This must be approved by the national Congress. The state legislatures determine the agencies' powers and duties, which are usually very broad.

In special circumstances the interstate bodies operate as federal agencies, as in the case of the Tennessee Valley Authority. As a rule the states involved and the Federal Government are all represented on their governing organs, as with the Ohio River Valley Water and Sanitation Commission.

Within the borders of each state the agencies may take on very varied forms. Their jurisdiction often extends over several municipalities or counties, and in such cases they may provide water directly or may sell it to the individual municipalities to distribute themselves.

As for operating structure, the Water Department is often combined with other municipal services (police, fire, public health, welfare, recreation, and so on) into a special group of agencies under a "managing director," as in Philadelphia. Or the water supply and sewerage services may be in a department of public works, as in Baltimore.

Seventy per cent of the agencies are public, and their funds come from two main sources: general or special taxes and fees collected for service. Often the two are combined. This income serves as backing for bond issues. Some sectors consider it justifiable to resort to general taxes to finance the building of the basic installations, since every property and every user will benefit. For the same reason, special assessments are considered justified for the construction of local distribution projects.

In most cases the funds for original installations or major expansions come from any of three types of bonds: revenue bonds, general obligation bonds, and special assessment bonds. For the networks the method of front-foot assessment is common.

In general, resources and expenditures are balanced. The annual balances and budgets are evidence of the importance assigned to paying capital and interest and forming replacement funds. Metering is usual, though it does not always date back very far.

Generally speaking, a considerable diversity of form at state, county, and municipal levels seems to have been superimposed on cohesive-ness and similarity of principles. This has not kept water services from reaching a high percentage of the population; public agencies—essentially municipal or in the shape of authorities, commissions, or districts—supply 90 per cent of the total.

Chronologically, the greatest progress has been made during the present century: there were 4,000 services in 1900 and 18,000 in 1960. Engineer L. R. Howson declares that the United

States has spent as much on water installations in the past 10 years as in the 150 preceding years, when the first public water systems were built.

Monetary stability; investor confidence; a constructive frame of mind on the part of officials, property owners, and users; a high technical level; and proven reliability of service—all these have contributed to expansion and to economic and financial soundness. There can be no doubt that the efficient organizational and financial mechanism reflect the factors responsible for the high level of economic development that has been achieved: adequate institutional structure, availability of capital, good use habits, natural resources, technical skill, business ability, and a progressive mentality in all sectors.

Uruguay

For practical purposes, Uruguay has had a semiautonomous central agency since 1919, when the Sanitation Bureau of the Ministry of Public Works began to provide effective service in the interior of the country. The merger of this agency with the Running Water Company, which had been in existence since 1879, gave rise to the State Sanitation Works Administration (OSE), a decentralized agency of the Ministry of Public Works created in December 1952. The sewer system of Montevideo, however, is run by the Department of Engineering and Works of the city's Departmental Council, through its Sanitation Bureau.

In mid-1961 OSE was responsible for 220 water systems of all kinds, ranging from complete systems to simple wells with hand pumps, and for 24 sewer installations. Seventy-five per cent of the population had potable water and 45 per cent had sewerage.

The purpose of OSE is to provide potable water and sewerage services throughout the country; to study, build, and operate services; and to exercise control over the safety of the water sources it uses directly or indirectly. OSE may sign contracts with the municipalities for the provision of sanitary services "by means of contributions from the parties and subject to the approval of the Executive Power."

Resources come mainly from the National Government, through bond issues. Differential rates—increasing with consumption—are imposed, and the schedule is uniform throughout the country. Most water service is metered—90 per cent in Montevideo and 70 per cent in the interior.

In 1961 OSE initiated a works plan, at an estimated cost of US\$15,500,000, to improve and

considerably expand the water system of Montevideo; half the cost will be met by loans from the Export-Import Bank and the IDB. That same year, the Montevideo Departmental Council began an extension of the sewer system aimed at serving 30,000 inhabitants at a cost of US\$12,000,000. An IDB loan of US\$2,500,000 will help to finance this project. The rate schedules are being adapted to meet these commitments.

To expand the water supply services of the cities of San Carlos, Maldonado, Punta del Este, and Piriápolis, a rise of 130,000,000 pesos in the national internal debt was authorized and a loan of US\$3,600,000 was obtained from the IDB. The projects will be carried out by OSE.

A satisfactory sanitation level has been reached in the Uruguayan countryside. Under a tripartite agreement between the Ministry of Public Health, OSE, and the Geological Institute, drinking water wells are being drilled in various places.

The basic organizational structure in Uruguay is adequate to the carrying out of integrated water and sewerage programs.

Venezuela

The National Institute of Sanitary Works (INOS), established in April 1943 as an autonomous agency of the Central Government, under the Ministry of Public Works, has jurisdiction over the entire country in matters of urban sanitation. Its objectives are the study, construction, repair, reform, expansion, exploitation, and administration of water supply services in cities of more than 5,000 population.

To operate at the municipal level, INOS signs special agreements in which the contractual obligation is based on the local financial capacity. Each agreement specifies the terms of reimbursement of the capital contributed by INOS and the rate schedule to be applied. Contracts signed since 1962 stipulate that INOS has a right to the income from charges up to the amount of its contribution and that the rates should cover direct operating, maintenance, and administrative costs and debt service.

In 1961 INOS undertook the construction of 55 water supplies serving a population of 380,000. From 1959 to mid-1963 it had invested more than 500 million bolivars in construction throughout the country. At the same time the Rural Waterworks Division of the Department of Malaria and Environmental Sanitation began a water program for 330 communities of 500 to 5,000 population—a total estimated at 300,000 persons. In many of these communities autonomous

boards have been formed to administer the services. The IDB assisted these programs with two loans of US\$10,000,000 each; the Ministry of Health and Social Welfare is contributing 19 million bolivars and the regional governments 20 million bolivars; and UNICEF is making an additional contribution of 1.4 million bolivars.

The Division has prepared a new rural program to supply water to 300 communities with 275,000 inhabitants. Another IDB loan of US\$10,000,000, approved in December 1964, will help to finance it. Of the population to be served, 82 per cent will have household connections and the rest will have public taps. As a result of the scattering of population, the cost per capita is high. A solution is being sought on the basis of other economic and social development plans for these communities.

In the Caracas metropolitan area the projects carried out by INOS have increased the available safe water supply by nearly eight times, and in Maracaibo basic projects serving 1,250,000 persons were carried out with IDB assistance furnished in 1963.

With respect to the goals of the Charter of Punta del Este, INOS has formulated a plan for the period 1965-1971, the main provisions of which are as follows: additional population to be served with potable water, 1,790,405; additional population to be served with sewers, 2,542,482; investments in water supply (including basic projects in the metropolitan area),

813,400,000 bolivars; investments in sewers, 555,400,000 bolivars. A policy has been outlined that tends toward self-financing and calls for a reorganization of the technical-administrative structure; studies have been carried out with consultant firms, with the PASB cooperating.

Summary

The author presents a study of agencies in the Americas concerned with water supply and sewerage systems. General information, concepts, and over-all tendencies are given in the first part, which outlines the most significant advances and trends, and several starting points are indicated for making more complete studies of the subject, in line with the goals set forth in the Charter of Punta del Este. The second part describes the institutions engaged in this field of activity in 20 countries of the Hemisphere. Two tables provide data on the individual countries: one on land area, population, and socioeconomic indicators; and the other on national and local agencies concerned with water supply and sewerage systems, and on special laws or funds created during the period 1961-1965.