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WATER SUPPLY AND SANITATION

Based on the survey of 23 countries in Latin America and the Caribbean, the situation of the water supply and sanitation sector has not substantially improved since the beginning of this decade. By 1995, 73% of the population had access to water by house connections or a water source at a reasonable distance. For the same period, 69% was reported to be served by adequate sewage and excreta disposal. Several countries lowered their water service coverage, possibly assessing better these services in the light of the cholera epidemic. There are still large gaps in service coverage between countries and in particular between urban and rural areas. An increase in the coverage for sewage and excreta disposal was reported as well as for disinfection of water supplies. Of the total population, 59% reported receiving disinfected water on a regular basis.

The investment in the water and sanitation sector during the period 1990-1995 also fell short of the estimated requirement in the Regional Plan for Investment in the Environment and Health (PIAS) for supporting sector development and achieving full coverage in this decade.

This report is presented in compliance with mandates from the Governing Bodies and is intended to provide information about the situation and trend in the water and sanitation sector at the midpoint of the decade and to make recommendations to achieve the sector goals.

Based upon the information from the survey, and the public health implications of adequate water supply and sanitation, the Subcommittee is requested to consider the recommendations presented.

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EXECUTIVE SUMMARY

The 1995 total population of Latin America and the Caribbean was estimated at 473.7 million, which would indicate an increase of some 40 million persons over the 1990 population. This population is expected to increase to 513.3 million by 2000. Based on reports received in conjunction with the 1995 survey from 23 countries in the Region (covering 98% of the population), 340 million people have access to water supply by house connection or other acceptable means (73%).

The survey revealed that the development of water services in this Region has been slower than expected. In response to the cholera epidemic, some countries revised downward their service coverage as more consideration was given to what constitutes reasonable access to safe water. Other countries reported a significant increase in their level of water coverage.

The reports also indicated major inequity between the urban and rural sectors. The urban water coverage was estimated at 84%, while the rural population covered by water supplies was reported at 41%.

Wastewater collection and other acceptable methods of excreta disposal coverage at the end of 1988 were reported at 66% of the population. The 1995 survey reported this coverage at 69%. The urban service coverage remains at 80%, while a small increase to 40% was recorded for the rural population.

The survey indicated that the mean percentage of sewage collected that receives treatment is just above 10. However, some countries indicated progress in the construction of sewage treatment plants.

An estimate of all investment in the sector was around US\$ 12 billion for the period 1990-1995, of which \$7.5 billion was from internal sources, far short of the estimated total investment of \$55 billion that would be necessary during the same period to achieve universal coverage of water supply and sanitation, according to the Regional Plan of Investment in Health and the Environment (PIAS) proposed by PAHO following the reintroduction of cholera in this Hemisphere.

Since the end of the last decade, the countries have been engaged in a process of sector reform prompted by the lack of efficiency of agencies in the sector. This reform includes aspects of modernization and decentralization, which provide the dynamism to the sector in the Region. Also, since the cholera epidemic in 1991, there has been considerable interest in the disinfection of water, and this has resulted in some progress in that area. Available information puts the level of served population that receives disinfected water on a regular basis at 59%.

Full coverage of safe water supplies and sanitation remains the primary goal in the Region. PAHO will continue to support the mobilization of resources in the context of PIAS and to support sector reform and modernization.

Governments and financial and international agencies are urged to step up their efforts to achieve the goals of water and sanitation by the year 2000 outlined in the World Summit for Children and in other fora.

PAHO is urged to organize a Regional effort to follow up on Initiative 47 of the Santa Cruz Summit, promoting a Regional Plan for Drinking Water Quality at the highest political and technical levels.

1. Background

In the American Region, the extensive survey carried out at the completion of the International Drinking Water Supply and Sanitation Decade (1981-1990) evaluated the situation of drinking water supply and sanitation in Latin America and the Caribbean and established the coverage of these basic services in 1990. The report was presented to XXXV Meeting of the Directing Council (1991) which, inter alia, requested the Director of the Pan American Health Organization to continue to give high priority to the promotion of the development and efficient management of basic water supply and sanitation services in the countries, with emphasis on urban and rural poor and high-risk groups, and to assist the countries in developing and maintaining national information systems to monitor and evaluate program progress as well as regional progress. The Council also requested the Director to develop actions which are complementary to water and sanitation programs and to increase their sanitary and health impact. These actions should include education and training programs, research, technology development, information exchange, and community participation.

The Directing Council also urged the countries to renew their political commitment to the improvement of water supplies and sewage and excreta disposal services, improving water quality through the protection of water sources including the treatment of wastes that may affect them and improved management of water treatment and distribution systems; and to promote social mobilization in the water and sanitation sector, involving communities in planning, financing, and managing water and sanitation services.

At the international level, several other recommendations which supported the above mandates were made, related to the conduct of the sector during the 1990s. The most important resolutions are indicated below:

- The 1990 *World Summit for Children* adopted the World Declaration on the Survival, Protection, and Development of Children and endorsed a Plan of Action which called for the universal coverage of water supplies and elimination of excreta in a sanitary manner by the year 2000.
- The *New Delhi Statement*, which resulted from the worldwide evaluation of the International Drinking Water Decade, recommended the provision of safe water in sufficient quantity and proper sanitation for all (by the year 2000).
- The 1992 *Rio Conference (Earth Summit 1992)* resulted in the adoption of the Agenda 21, which presented a comprehensive set of recommendations for sustainable development of urban and rural water supplies.
- The *Caribbean Cooperation in Health Initiative* also established targets of complete coverage of water and basic sanitation by 1995.
- The *Declaration of Santa Cruz de la Sierra* requested, inter alia, that governments strengthen their programs to increase access to safe water, to fight the contamination of water

resources, and to assure that water supplies are safe and adequate.

2. Mid-Decade Evaluation (1995)

2.1 Objectives

The purpose of this report is to assess the situation in the water and sanitation sector in light of the information available as of December 1995, representing the midpoint of the decade, and to present recommendations that should guide future actions of the governments, and health ministries in particular, during the remainder of the decade. The report also seeks to provide a basis for discussion for government and international agencies involved in the sector to make adjustment to strategies and programs that would overcome the deficiencies outlined.

2.2 Methodology

The questionnaire entitled “Water Supply and Sanitation Forms for Sector” was sent in English and Spanish to the countries of Latin America and the Caribbean. Information from the country reports presented at the Water and Sanitation Monitoring System Workshops carried out in 1995 in Central American, Andean, and Southern Cone countries was used to complete the coverage data. Information from the World Bank and the Inter-American Development Bank was used to complete the financial picture. Information from the evaluation of the International Drinking Water Supply and Sanitation Decade was used to report on the situation in 1990.

The lack of a reliable information system remains a critical problem for assessing the water and sanitation situation at the national level. Some countries have found it difficult to provide the information requested.

2.3 Situational Analysis in 1990

2.3.1 Evaluation of the International Drinking Water Supply and Sanitation Decade (1990)

The International Drinking Water and Sanitation Decade (1981-1990) evaluation report indicated that by the end of 1988 an estimated 79% of the population had reasonable access to water supplies by house connection or to a public source. For the same period, 66% of the population was reported to have access to a sanitary means of excreta disposal. This report also indicated a significant difference in the level of coverage between the urban and the rural sectors and between countries. A summary of the sector coverage reported in this evaluation is shown in Table 1.

Table 1

Percentage (%) Population with Access to Water Supply and Sanitation (1988)			
	Total	Urban	Rural
Water	79	88	55
Sanitation	66	55	32

The report further recognized that several deficiencies with regard to the quality of services, such as intermittent supplies and shortcomings in operation and maintenance, may result in contamination of water supplies. It was also noted that monitoring and surveillance of drinking water quality was limited, as was the level of coverage of disinfection facilities. Discharge of untreated or inadequately treated wastewater was noted as a major pollution threat to surface- and groundwater. In addition to biological contamination, chemical contamination due to industrial wastes was a matter of concern.

2.3.2 Sector Constraints

The evaluation of the International Drinking Water and Sanitation Decade was presented to the Regional Conference on Water Supply and Sanitation held in San Juan, Puerto Rico, in September 1990. The Conference recognized several constraints which continued to plague the sector and that needed to be addressed by policymakers and international agencies, including: inadequate organization, in particular the excessive division of responsibilities and duplication of functions, limited coordination, and excessive centralization; difficulty in recovering investment and in generating income through payment for services, resulting in administrative deficiencies; wasteful use, due to the prevalent culture which precludes awareness of the value of water and the need to use it rationally and to pay a realistic price for the services; and the need for more attention to be paid to human resources development.

At the base of any serious sector development remains the political commitment of the governments, collectively and individually, to improve the situation and allocate the necessary resources.

2.4 Population Projections

The 1995 total population of Latin America and the Caribbean was estimated at 473.7 million, which would indicate an increase of some 40 million people over the 1990 population. The Economic Commission for Latin America and the Caribbean (ECLAC) population estimates for 1990 and 1995 and projections for the year 2000 are 433.0 million, 473.7 million, and 513.3 million, respectively. Based on these projections, an additional 80 million people would need to be provided with water supply and sanitation between the years 1990 and 2000, added to the deficit of 89 million already reported in the 1990 evaluation.

2.5 Coverage and Level of Services (1995)

2.5.1 Coverage of Water Supply

The information provided by the countries put the 1995 coverage for the total population with access to water supplies by house connections or other acceptable means (such as public standposts at a reasonable distance) at 73%. This information is based on the reports provided by 23 countries, covering 98% of the population of Latin America and the Caribbean. Reasonable access to water supplies is defined in an urban environment as the availability of water at a distance not farther than 200 meters from a house to a public standpost. In rural areas the definition is more flexible and may vary with the topography of the area.

The survey indicates that the development of water supply services in this Region has been much slower than predicted. Several countries have revised downward their level of coverage, as they have begun to look more closely at their water supply infrastructure as a result of the cholera epidemic, and are giving more attention to factors such as the reliability of the services and distance to water access.

Table 2

Population with Access to Drinking Water (1995)			
	Total (in millions)	Urban (in millions)	Rural (in millions)
Population Reported	468	343	125
Population Served	340	289	51
% Coverage	73	84	41

In 1995, several countries, including Brazil, Colombia, Haiti, and Venezuela, reported reduced coverage figures for total water supply. Annex A shows individual country access to water supply as reported in 1995. Brazil reported a drop in urban water supply coverage from 100% (1988) to 80% (1995), and in rural coverage from 86% to 28%. Haiti also reported a drop from 55% in urban coverage in 1988 to 38% in 1995, due to the effect of political instability and the economic embargo which caused several facilities to deteriorate. Venezuela reduced both urban and rural coverage from 89% in 1988 to 79% in 1995. An in-depth evaluation is needed to analyze the fluctuations in the water supply coverage in these countries, in order to reach a conclusion.

Some countries, among them Bolivia, Dominican Republic, and Mexico, reported a significant increase in water supply coverage over 1988. Mexico reported an increase from 80% and 41% coverage in urban and rural water supplies to 83% and 57%, respectively, from 1988 to 1995, and the Dominican Republic, from 68% and 28% in 1988 for urban and rural water coverage to 88% and 55%, respectively, in 1995. Bolivia reported an increase from 46% in 1988 to 70% in 1995.

The report shows that major disparities still exist between the countries as far as coverage is concerned. Haiti and Paraguay are still covering less than 40% of their population with access to a safe source of water, while other countries (Ecuador, Guatemala, Nicaragua, Peru, and now also Brazil) are reporting less than 70% coverage. The total unserved population is estimated at 128.3 million. In comparison, information from the U.S. Environmental Protection Agency indicates that in the United States 250 million people (93%) are served by public water systems and 20 million (7%) by private systems. Canada indicates that 99% of the population has safe water—86% by central systems and 13% by individual means.

2.5.2 Rural Water Supply

In spite of small growth in the rural population in Latin America and the Caribbean between 1990 and 1995, the rural water supply coverage is still limited. Ten countries reported coverage of less than 40% for their rural population, or more than 74 million unserved people. Several projects have been designed to provide drinking water to rural and indigenous populations who never had drinking water before. Projects such as the one in Bolivia using simple hand-pump technology encourage the development of rural and indigenous micro-enterprises for the drilling of water wells. Technical cooperation between countries to provide the technology and to promote this approach is also encouraged through this project.

2.5.3 Sewage and Excreta Disposal

At the end of the International Drinking Water Supply and Sanitation Decade, wastewater and excreta disposal facilities were extended to 66% of the population. In 1995 total coverage had increased to 69%. Urban services remained constant at 80%, but rural services were expanded to cover approximately 38% of the population (Table 3).

Table 3

% of Population with Access to Sewage and Excreta Disposal			
	1980	1988	1995
Total	59	66	69
Urban	78	80	80
Rural	22	32	40

The data further indicated that in urban areas only 52% of the population is connected to municipal sewage collection services. The remaining population is served by individual systems. For the most part, sewage disposal in rural areas is by individual systems, mainly latrines and in limited cases septic tanks and seepage fields. Because of the high cost of sewage collectors, appropriate technologies which combine septic tank systems and small-diameter sewers have been successfully applied in several countries.

By the end of 1995, based on the figures provided by the countries, the total unserved population was 145 million (67 million in urban areas and 78 million in rural areas). Annex B shows the coverage for each country.

The lack of infrastructure for water supply and sanitation service was largely blamed for the resurgence of cholera in Latin America and the Caribbean. In contrast, 75% of homes in the United States are served by centralized collection systems, and most of the remaining 25% are served by septic tank and soil absorption systems. Canada indicates that 95% of its population is provided with adequate wastewater facilities: 75% of these systems are central and 25% are individual. Five percent of the central systems discharge wastewater without adequate treatment.

2.5.4 Sewage Treatment

One of the most critical sanitary problems in Latin America remains the lack of sewage treatment. Untreated and inadequately treated sewage contaminates surface and groundwater. The contamination of groundwater by nitrate has caused a large number of water-producing wells to be abandoned.

Previous estimates put the level of sewage that received treatment at 10%. The present survey indicated that the mean percentage of sewage collected that received treatment is just over 10. Argentina reports treating 10% of its sewage, while Colombia reports only 5%. Brazil estimates its sewage treatment coverage at 20%. Water pollution problems in Latin America have been well documented. Some country efforts are worth mentioning. The Buenos Aires metropolitan area has constructed 20 waste treatment plants and is in the process of building 15 more. Mexico has built 16 treatment plants to control the discharge of wastewater into the Lerma-Santiago River basin. Many of the large coastal cities dispose of their sewage by ocean outfalls.

The consultative meeting on excreta and wastewater disposal in Latin America and the Caribbean held in 1991 identified the lack of political support and financing of wastewater facilities as the most critical issues for the subsector. At that meeting, it was strongly recommended that the international financing institutions consider a more integrated approach for projects, particularly that water supply projects not be financed unless there is a concomitant commitment to the disposal of wastewater. The development of integrated and well-coordinated water resources management programs that would give consideration to the health, environmental, and economic aspects was recommended as the proper strategy for the Region. An increase in the level of research on the use of appropriate technologies to provide low-cost solutions to the collection, treatment, and disposal of wastewater was also recommended.

2.6 Financing of Water Supply and Sanitation

A total investment of \$115 billion between 1993 and 2004 to achieve universal coverage was estimated by the Regional Plan of Investment in Health and the Environment (PIAS), proposed by PAHO following the reintroduction of cholera. The bulk of the financing (70%) was to come from national investment and the balance (30%), from external sources.

The information provided by the countries is not sufficient to give a detailed account of the total investment in the sector during the period 1990-1995. However, the preliminary indication is that the total investment in the sector for the period does not nearly approximate the

estimated requirement to meet the mid-decade targets nor the goal of universal coverage by the year 2000 or 2003 as indicated above. A likely estimate of all investment in the sector would be around \$12 billion for the period 1990-1995, of which \$7.5 billion is from internal sources.

Information provided by the financing agencies indicated that the two largest banks, the World Bank and the Inter-American Development Bank, invested a total of \$4.27 billion during the period 1991-1995, including \$1.58 billion in Mexico. The German Government reported spending \$111.3 million during the same period and the Canadian International Development Agency, \$11.2 million in Central America. The Caribbean Development Bank reported spending \$53.9 million in water and sanitation projects in the Caribbean. This would indicate a sum of \$4.5 billion invested in the sector for the period under review. Other agencies that provided investment in the sector include the European Community, the Japan International Cooperation Agency, the United Nations Children's Fund, and the United States Agency for International Development.

The ratio of external contributions to total investments in the countries varies from 21% in Panama to 97% in Haiti, with an average of approximately 45%, in comparison to 30% reported in the previous decade.

Investments in sewerage and sanitation continue to lag behind those for water supplies. Available information indicates that sewerage and sanitation investments represented approximately 50% of the water investment during the period.

2.7 Privatization

In order to overcome financial and managerial constraints to sector development, the countries have been engaged in a process of sector modernization and reform. These reforms were prompted by the lack of effectiveness and efficiency of the agencies in the sector. In fact, water agencies were highly subsidized by the central and local governments and were frequently used as a place for political employment. One important aspect of the modernization of the sector has been a move toward decentralization, and increased participation by the private sector in the water and sanitation sector.

A large coverage of water supplies by private organizations was reported by Argentina. Other countries, such as Bahamas, Brazil, and Honduras, also reported some coverage by private entities. In Chile, the regional water and sanitation companies have decentralized and are operating on a commercial basis. In Colombia, greater responsibility has been given to the municipalities for the development of infrastructures, including drinking water and sanitation. In the Caribbean, Trinidad and Tobago has recently privatized the operation of its Water and Sewerage Authority.

3. Drinking Water Quality

3.1 Water Disinfection Coverage

Since the cholera epidemic in 1991 there has been considerable interest and progress in the disinfection of drinking water supplies in Latin America and the Caribbean. Nevertheless, systematic disinfection of water continues to be a problem in the Region. The scarcity of chlorine due to logistical problems, lack of funds, and improper operation and maintenance of disinfection equipment has led to several episodes where there was no disinfection, particularly in small towns. The period 1990-1995 also witnessed a considerable interest and increase in the use of technologies for on-site generation of chlorine and other disinfectants for the improvement of water quality.

The survey, together with a previous study carried out in 1994 on the status of disinfection in Latin America and the Caribbean, indicates that only 59% of the population receives disinfected water on a regular basis. When the information is broken down by urban and rural, a completely different picture emerges. Five countries, including Brazil, the largest country in the Region, reported less than 10% of their rural water supply population covered with disinfected water supplies, and four more countries reported less than 50% of the population served by disinfected water supplies. Available information indicates that Mexico has been able to increase coverage of chlorinated water from 35 million people in 1991 to approximately 68 million people in 1994. Information for each country is shown in Annex C.

In general, the microbiological contamination of drinking water remains the principal water quality problem in the Region. Furthermore, the risks of contamination by cryptosporidium and giardia have not been routinely evaluated. The issue of health risks due to chlorination by-products was debated by the International Agency for Research on Cancer in 1991 and at the Conference on Balancing the Microbial and Chemical Risks of Drinking Water Disinfection, cosponsored by PAHO in Washington in 1992 and in Argentina in 1994. The recommendation of these Conferences is that "since the cost of disinfection, especially chlorination, is so low and the health benefits are so extraordinarily high, disinfection should be practiced universally, maintaining an adequate residual in all points of the distribution network and residences, to enable everyone to enjoy the benefit of microbiologically safe water."

3.2 Cholera

The main factor responsible for the shaping of the water and sanitation program in this Region during the period 1990-1995 was the reappearance of cholera. After nearly 90 years, cholera reappeared in the Region of the Americas in January 1991. The seventh pandemic of cholera arrived via the coast of Peru and subsequently spread inland to most countries of the Region. Intensified efforts in all aspects of prevention and control have been taken. The disease now appears to be endemic, and significantly increases the economic costs and the overburdened health systems of the countries of the Region.

The current cholera epidemic has increased awareness of the importance of drinking water quality to the control of diarrheal diseases. Several direct types of interventions have been considered, including household disinfection and home filtration as emergency measures.

Table 4

Cholera Cases and Deaths in Latin America					
	1991	1992	1993	1994	1995
Cases	396,533	358,169	303,734	194,574	85,802
Deaths	4,093	2,617	2,460	1,321	847

The cholera epidemic has also focused attention on the deteriorating state of infrastructure development of the countries and the financial requirements for the improvement of community water supply and sewerage services.

Since 1991, most countries and the international community have approached the cholera situation on an emergency basis, and various plans and projects for prevention and control of cholera have been developed. The PAHOWHO Community Water Supplies Program (CWS) supported several interventions and activities directly related to the improvement of the quality of drinking water, with positive results that merit a widening of their scope to reduce the risk of the transmission of diarrheal diseases.

3.3 Monitoring and Evaluation

The continuous monitoring and evaluation of water supplies and sanitation requires the use of indicators that can be easily evaluated at local and national levels. These indicators reflect both health and environmental criteria, such as the prevalence of diarrheal disease in the country, the microbiological content of the water supply, and the level of disinfection and other chemical parameters as needed. Efficient mechanisms will continue to be developed to link drinking water quality and epidemiological surveillance.

WHO and UNICEF signed the agreement for the Joint Monitoring Program For Water Supply and Sanitation in 1990, to assist Member States to develop information that more accurately estimates the coverage and quality of water supply and sanitation services. This program has been introduced in the Region and could be used to facilitate the monitoring of access to drinking water and sanitation, drinking water quality, and environmental indicators.

Through the Joint Monitoring Program and the Regional Water Data Base, PAHO will prepare a regional status report on drinking water quality and on the water and sanitation sector in the Region in 1998 and 2000. PAHO will assist the countries in developing their information systems for monitoring access to services and drinking water quality.

4. Conclusions and Recommendations

From the information provided by the countries in relation to the mid-decade survey, the following conclusions are reached:

- Water supply and sanitation programs in Latin America and the Caribbean are not proceeding at a pace that could guarantee the achievement of the mid-decade targets and the goals set for the year 2000 as indicated in the World Summit for Children. The available information indicates a lack of progress in the sector. A greater awareness by the countries about what constitutes safe water, in light of the cholera epidemic, may play a role in the downward revision of the data provided by countries like Brazil. Other countries, such as Bolivia, Dominican Republic, and Mexico, have indicated considerable progress.
- Available financial information indicates that the level of investment in the sector fell short of the required investment to achieve significant increase or full coverage by these services. The lack of investment and the limitations in financing have been reported as a significant constraint on the sector.
- The sector problems remain basically organizational and institutional, with several countries reporting lack of an adequate institutional framework as the major constraint to sector development.
- The proposal for a drinking water quality plan provides an integrated approach to improve drinking water quality programs in the countries and to reduce health risks and diarrheal diseases.

It is recommended that:

- Governments step up their efforts to achieve the goal of water and sanitation by the year 2000 as outlined in the World Summit for Children and in other fora, and the countries, in particular those that have shown a drop or lack of progress in coverage, evaluate their internal situation in order to take corrective actions.
- Governments and financial institutions make special efforts to increase resource mobilization and the means for financing water and sanitation projects.
- Ministries of Health take the leadership to ensure that water quality constitutes an integral component of the effort to provide the population of countries of Latin America and the Caribbean with adequate preventive health care; disinfection of drinking water to be promoted, in particular in rural areas and to high-risk populations.
- In the context of the Regional Plan for Investment in the Environment and Health, PAHO continue to support sector reform and modernization, including aspects of decentralization and participation of the private sector.
- PAHO continue to support sector modernization efforts which aim at decentralization of

the management of water services and increased financial responsibility, and develop clear policy and operational guidelines for privatization and decentralization to assist countries in their sectoral reform.

- PAHO organize a Regional effort to follow up on Initiative 47 of the Santa Cruz Summit, promoting a Regional Plan for Drinking Water Quality at the highest political and technical levels.

ANNEX A. LATIN AMERICA AND THE CARIBBEAN: POPULATION SERVED WITH WATER SUPPLY

Data for 1995 (Population in thousands)

Country	Population			Drinking Water Population								
	Total	Urban	Rural	Total Popul. Served Population	%	Urban Population			Rural Population			
						House Connections	%	Easy Access	Total	%	Total	%
Argentina	34,587	30,152	4,434	22,590	65	20,580	68	944	21,524	71	1,066	24
Bahamas	278	235	43	261	94	207	88	17	224	95	37	86
Bolivia	7,061	4,320	2,741	4,979	70	3,232	74	579	3,811	88	1,168	43
Brazil	161,790	126,190	35,594	111,035	69	93,158	74	7,867	101,025	80	10,010	28
Chile	13,951	11,823	2,128	12,644	91	11,649	99	-	11,649	99	995	47
Colombia	35,886	26,491	9,395	26,848	75	22,782	86	1,060	23,842	90	3,006	32
Costa Rica	3,300	1,441	1,859	3,286	100	1,438	100	-	1,438	100	1,848	99
Cuba	10,998	8,200	2,798	10,020	91	6,749	82	1,251	8,000	98	2,020	72
Dominican Rep.	7,374	3,996	3,378	5,388	73	2,255	56	1,259	3,514	88	1,874	55
Ecuador	11,460	6,944	4,516	6,256	55	5,485	79	321	5,806	84	450	10
El Salvador	5,310	2,685	2,625	2,831	53	2,103	78	105	2,208	82	623	24
Guatemala	10,621	4,108	6,513	7,087	67	3,461	84	517	3,978	97	3,109	48
Haiti	7,180	2,588	4,592	2,795	39	743	29	246	989	38	1,806	39
Honduras	5,462	2,425	3,037	4,211	77	1,870	77	337	2,207	91	2,004	66
Mexico	91,606	66,396	25,210	76,097	83	61,761	93	-	61,761	93	14,336	57
Nicaragua	4,139	2,138	2,001	2,553	62	1,847	86	146	1,993	93	560	28
Panama	2,630	1,412	1,218	2,216	84	1,380	98	18	1,398	99	888	73
Paraguay	4,564	2,297	2,267	1,768	39	1,358	59	260	1,618	70	150	6
Peru	23,468	16,445	7,021	15,486	66	10,410	63	2,878	13,288	81	2,198	31
Suriname	410	263	147	366	89	250	95	13	263	100	103	70
Trinidad	1,257	887	370	1,212	96	800	90	87	887	100	325	88
Uruguay	3,129	2,820	309	2,795	89	2,626	93	169	2,795	99	-	-
Venezuela	21,844	18,656	3,188	17,276	79	13,696	73	1,073	14,769	79	2,507	79
Total	468,305	342,912	125,384	340,000	73	269,840	79	19,147	288,987	84	51,083	41

ANNEX B. LATIN AMERICA AND THE CARIBBEAN POPULATION SERVED WITH SANITATION SERVICES

Data for 1995 (Population in Thousands)

Country	Population			Sewage and Excreta Disposal								
	Total	Urban	Rural	Total Population Served		Urban Population			Rural Population			
				Population	%	House Connections	%	Others	Total	%	Total	%
Argentina	34,587	30,152	4,434	26,104	75	11,686	39	12,565	24,251	80	1,852	42
Bahamas	278	235	43	278	100	38	16	197	235	100	43	100
Bolivia	7,061	4,320	2,741	4,376	62	1,784	41	1,524	3,308	77	1,068	39
Brazil	161,790	126,190	35,594	109,075	67	44,036	35	49,563	93,599	74	15,476	43
Chile	13,951	11,823	2,128	11,231	81	9,340	79	1,891	11,231	95	-	-
Colombia	35,886	26,491	9,395	21,081	59	17,219	65	1,325	18,544	70	2,537	27
Costa Rica	3,300	1,441	1,859	3,198	97	788	55	653	1,441	100	1,757	95
Cuba	10,998	8,200	2,798	9,643	88	3,608	44	3,953	7,561	92	2,082	74
Dominican Rep.	7,374	3,996	3,378	5,880	80	1,127	28	2,445	3,572	89	2,308	68
Ecuador	11,460	6,944	4,516	6,073	53	4,262	61	627	4,889	70	1,184	26
El Salvador	5,310	2,685	2,625	4,091	77	1,615	60	773	2,388	89	1,703	65
Guatemala	10,621	4,108	6,513	7,141	67	2,868	70	998	3,867	94	3,274	50
Haiti	7,180	2,588	4,592	1,846	26	-	-	1,112	1,112	43	734	16
Honduras	5,462	2,425	3,037	4,453	82	1,216	50	1,078	2,294	94	2,159	71
Mexico	91,606	66,396	25,210	69,292	76	54,063	81	8,000	62,063	93	7,229	29
Nicaragua	4,139	2,138	2,001	2,437	59	730	34	1,147	1,877	88	560	28
Panama	2,630	1,412	1,218	2,381	90	899	64	500	1,399	99	982	81
Paraguay	4,564	2,297	2,267	1,465	32	466	20	-	466	20	999	44
Peru	23,468	16,445	7,021	14,431	61	9,654	59	3,141	12,795	78	1,636	23
Suriname	410	263	147	303	74	6	2	244	250	95	53	36
Trinidad	1,257	887	370	1,204	96	284	32	580	864	97	340	92
Uruguay	3,129	2,820	309	1,593	51	1,593	56	-	1,593	56	-	-
Venezuela	21,844	18,656	3,188	15,767	72	11,562	62	2,295	13,857	74	1,910	60
Total	468,305	342,912	125,384	323,343	69	178,844	52	94,611	273,457	80	49,886	40

ANNEX C. WATER DESINFECTION: COVERAGE FOR LATIN AMERICA AND THE CARIBBEAN

Water Disinfection Coverage for Latin America and the Caribbean

