WATER AND THE MILLENNIUM DEVELOPMENT GOALS

INVESTMENT NEEDS IN LATIN AMERICA AND THE CARIBBEAN

INTER -AMERICAN DEVELOPMENT BANK

Okinawa, Japan
April 6, 2005

Index

Introduction

In September 2000, 191 nations approved the Millennium Declaration, which has defined issues related to peace, security and development, including areas such environment, human rights and governance as essential concerns for human development. As a result, the Millennium Declaration Development Goals were agreed upon, with the aim of stating the current priorities of humanity, and the agreement on the imperative need of joining efforts to address these issues. This in no way undermines prior agreements on other goals subscribed at global summits and conferences held during the 90s.

These goals include the International Development Goals, synthesizing objectives in order to monitor human development, and focus their interest on eight priorities:

- Eradicating poverty and hunger
- Achieving universal primary education
- Promoting gender equality and strengthening women's status
- Reducing infant mortality
- Improving maternal health
- Fighting HIV/AIDS, malaria and other serious disease
- Ensuring environmental sustainability
- Fostering a world coalition for development

The goal of "Ensuring Environmental Sustainability", has incorporated the objectives of "reducing to half by 2015 the proportion of people who lack access to safe drinking water" and "to have achieved by 2020 a considerable improvement in the lives of at least 100 million dwellers of shantytowns."

For the first goal mentioned, the Application of the United Nations' Millennium Declaration states that the indicator shall be the "proportion of the population with sustainable access to improved water supply sources in urban and rural areas" and for the second goal, the "proportion of the urban population with access to improved sanitation services".

This study has been carried out within those guidelines, with the purpose of assessing the overall investment needs of Latin America and the Caribbean by 2015, based on the assumption of meeting the Millennium Development Goals with regards to improving access to drinking water services and to better sanitation. It should be noted that the estimates calculated in this survey will at a later stage be compared with the estimates carried out by each country's authorities, discussing their differences and similarities. Therefore, these estimates should be understood as preliminary, and to the best of our knowledge, they will constitute the first overall and systematic assessment of the investment needs in water and sanitation required in order to meet the Millennium Goals.

Regarding the organization of this report, Chapter I includes the description and interpretation of the Millennium Development Goals for drinking water and sewage, an analysis of regionalization of Latin America and the Caribbean for the purposes of this study, and the definition of relevant variables in order to monitor the performance of these goals and their definitions. Lastly, we submit the description of the current status in the different subregions and the progress made between 1990 and 2000.

Chapter II, on drinking water supply, includes the analysis establishing the number of people that should be provided with drinking water at subregional and country levels, as well as the investment amount needed to

achieve the goals of reducing the percentage of the population lacking coverage as stated in the Millennium Declaration.

Chapters III and IV repeat the abovementioned structure, addressing sanitation services in the region's urban centers. This is an indicator defined as relevant by United Nations in terms of measuring improvements in quality of life in shantytowns, to which we have added a few considerations regarding waste water treatment, directly related to quality of life in urban centers and to the sustainable development goals of the Millennium Development Goals.

Chapter V addresses equality as a long-term goal and the need to mitigate the deep regional imbalances suffered by some of the countries in the region, accelerating the pace of investment in the countries with the greatest relative deficit in access to drinking water systems and to sanitation services. To this end, we have sought to assess the additional capital needs that arise from adding to the Millennium Development Goals the criteria of regional equality.

The last chapter assesses the countries' and country groups' probabilities of meeting the goals. The amount required to perform maintenance work for installed systems and for long-term coverage is added to the overall investment sums needed.

Appendix I focuses specifically on the data sources and criteria used in order to lend consistency to the data quality and maximize its reliability. Appendix II includes analysis and establishment of unit costs applied in calculating investments at the country, regional and global level, for drinking water as well as for sanitation.

Chapter I
Institutional Framework and Current Status

GOALS AND OBJECTIVES

The United Nations[1] recommended considering the development priorities of each country and has stated that the Millennium Development Goals (MDG) should be considered within the context of the region in question. Following these recommendations, the establishment of the goals for Latin America and the Caribbean has taken into account the region's specific features, which shall be consulted at a later stage of this study with officials from the respective countries in order to confirm the criteria and goals adopted in this document.

As indicators, United Nations[2] suggests using the "proportion of the population with sustainable access to improved sources of water in urban and rural areas" and the "proportion of the urban population with access to improved sanitation services." The goals for the region are reducing by 50% between 1990 and 2015 the number of people lacking access to safe drinking water and the number of people without access to sanitation.

In addition, as a result of adding the objectives that may be pertinent for the region and including the goal of having achieved by 2020 a considerable improvement in the quality of life of at least 100 million people living in shantytowns, we have included the additional goal of reducing by 50% by 2015 the number of people lacking access to waste water treatment or final disposal systems.

SELECTION OF INDICATORS

With regards to the goal of "reducing by 50% between 1990 and 2015 the number of people lacking access to safe drinking water" the indicator used is the "proportion of the population with sustainable access to improved water supply sources in urban and rural areas." The goal of "having achieved by 2020 a considerable improvement in the quality of life of at least 100 million people living in shantytowns" is measured by the "proportion of urban population with access to improved sanitation services."

Two warnings should me made here. First, the goal of reducing by 50% the percentage of people lacking access to an improved water supply source is measured against the coverage levels in 1990[3] . The World Health Organization and the United Nations define a person with access to an improved source of drinking water when said person has reasonable access to an adequate amount of water from an improved source. This includes household connections, access to a public connection, protected wells or springs, and rainwater harvesting. The sources of drinking water not deemed improved include unprotected wells and springs, water from vendors, bottled water and water supplied by trucks. "Reasonable access" means that each individual is able to consume at least 20 liters a day and that the source of safe water is located no further away than one kilometer from his or her home.[4]

[1] United Nations, "Presentation of reports on the Millenium Development Goals at the country level," October 2001.
[2] United Nations, "Application of the Millenium Declaration of the United Nations," A/57/270.
[3] There initially was some ambiguity regarding the base year for the Millenium Development Goals. Finally United Nations decided to take 1990 as base year, with the exception of those cases where it explicitly refers to current levels (of 2000, year the declaration was published). "Presentation of reports on the Millenium Development Goals at the country level," October 2001.
[4] Source: Global Water Supply and Sanitation Assessment 2000 Report.

Secondly, the goal of reducing by 50% the percentage of people without access to an improved sanitation system is also measured against the coverage percentages as of 1990. Access to improved sanitation includes household connection to a public sewage system, connection to a septic tank, latrine with water discharge, dry latrine, and simple bored-hole latrine. The technologies deemed as unimproved are public latrines and/or latrines that do not adequately separate excretions from human contact.

REGIONALIZATION CRITERIA

Given that the study refers to Latin America and the Caribbean, and in order to facilitate comparison of the results, all estimates are calculated with a subregional disagregation, and when possible, estimates are disagregated by country. Thus, the criteria of regionalization and grouping used was the one employed by WHO/UNICEF in the regional chapter of the Global Water Supply and Sanitation Assessment 2000 Report.[5] The grouping employed is the following:

- **Group I:** Brazil and Mexico, two countries with an intermediate development and coverage level. Given their sizes (jointly they account for over 50% of the region's population) it is deemed advisable to study them separately.

- **Group II:** Bolivia, Colombia, Ecuador, Peru and Venezuela.

- **Group III:** Southern Cone countries, that is, Argentina, Chile, Paraguay and Uruguay.

- **Group IV:** Central American and Hispanic Caribbean countries. The Group includes Belize, Costa Rica, Cuba, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama and the Dominican Republic.

- **Group V:** Other Caribbean countries. The Group includes Antigua and Barbuda, Bahamas, Barbados, Dominica, Grenada, Guyana, Jamaica, Saint Christopher-Nevis, Saint Lucia, Saint Vincent and the Grenadines, Surinam and Trinidad and Tobago.

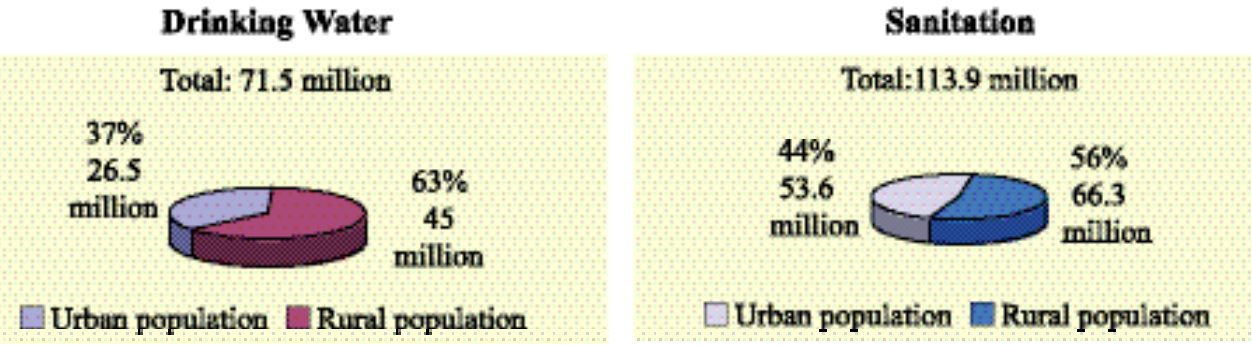
ANALYSIS OF THE CURRENT STATUS

Drinking Water Supply

In order to analyze the current status of access to the drinking water supply and to quantify the deficit to be covered and the capital demand associated to ensuring that the Millennium Goals are met, this study employs the database compiled by WHO and UNICEF in 2001 as per the data included in the *Global Water Supply and Sanitation Assessment 2000 Report* and prior surveys (see Appendix I).

[5] The original group numbering was altered due to the exclusion of the Group comprising the United States and Canada.

Population without Access in Latin America and the Caribbean (2000)



The global data on coverage for 2000 show that 71.5 million people still lack access to safe drinking water in Latin America and the Caribbean, representing 13.9% of the current population. Most affected are people living in rural areas: while in urban areas coverage reached 93.2%, in rural areas it amounted to just 64.6%.

Although there still remain significant deficiencies in drinking water coverage, it should be noted that the 90s have seen important progress. The percentage of the population with access to an improved source of water supply went from 80% in 1990 to 86% in 2000. A total of 96 million additional people were covered[6], a 27,7% increase in the number of people with access to an improved source of drinking water.

These improvements were achieved as a result of heavy investment in the sector. Overall, US$24.1 billion were invested between 1990 and 2000.

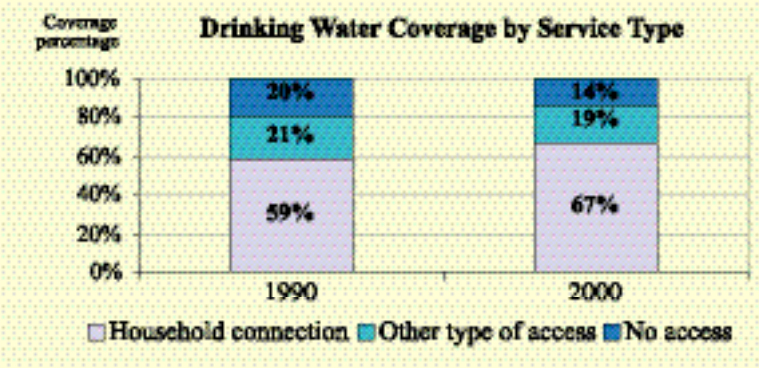
Investment in the Sector, 1990-2000

	DRINKING WATER		SANITATION	
	Annual Investment (in million US$)	Investment per Added Inhabitant (in US$)	Annual Investment (in million US$)	Investment per Added Inhabitant (in US$)
Urban Areas	$ 1.894	$ 214	$ 1.443	$ 185
Rural Areas	$ 516	$ 685	$ 60	$ 59
Total/Average	*$ 2.410*	*$ 251*	*$ 1.503*	*$ 171*

[6] Source: Global Water Supply and Sanitation Assessment 2000 Report.

During the 90s the percentage of the population with access to drinking water grew at an annual rate of 0.77% (8% for the whole decade). Growth in urban coverage was significantly lower than that of rural coverage. While the latter increased at an annual average rate of 1.3%, urban coverage on average grew just 0.4% per year. This is due to the growing urbanization of the region. Between 1990 and 2000 the percentage of urban population went from 71% to 75%, while at the same time the population living in rural areas fell from 29% to 25%.

Concurrently, significant improvements were made in the types of access to drinking water. The percentage of the population with coverage from household connection increased in large measure. Between 1990 and 2000, 89.3 million people obtained access to a household connection.[7]



Despite this, there are strong disparities between the countries within the region. There are countries with 100% or nearly 100% coverage, such as Barbados, Saint Lucia, and Saint Christopher-Nevis, as well as countries that are far from reaching acceptable coverage levels, such as Haiti (46%), Nicaragua (77%), El Salvador (77%), and Argentina (79%) among others.

However, significant differences currently persist between the type of services enjoyed by urban and rural populations. While 93% of the urban population with access to an improved source of drinking water has a household connection, in rural areas this only applies to 63% of the population.[8]

Improved Sanitation

According to the Assessment 2000 data, 40% of the world's population, or 2.4 billion people, do not have access to improved sanitation systems. Of this figure, 4.75% live in Latin America and the Caribbean, where 114 million people lack access to sanitation.

Similarly to what happens with drinking water, sanitation coverage is significantly larger for the urban population than for those living in rural areas. While urban sanitation coverage amounts to 86%, rural coverage is only 53%. There are also strong differences in the coverage level of the region's countries. At the low coverage end are countries such as Haiti (34%) and Belize (50%), contrasting with others such as Barbados and Bahamas, with total coverage.

[7] Global WaterSupply and Sanitation Assessment 2000. Given that this data on coverage by type of service uses a diferente database for global coverage, in order to adapt this information to data used in this survey, it was assumed that the proportion of access types were kept constant for both databases.
[8] Source: CEPIS/WHO, Assessment 2000.

Coverage Increase in Latin America and the Caribbean 1990-2000

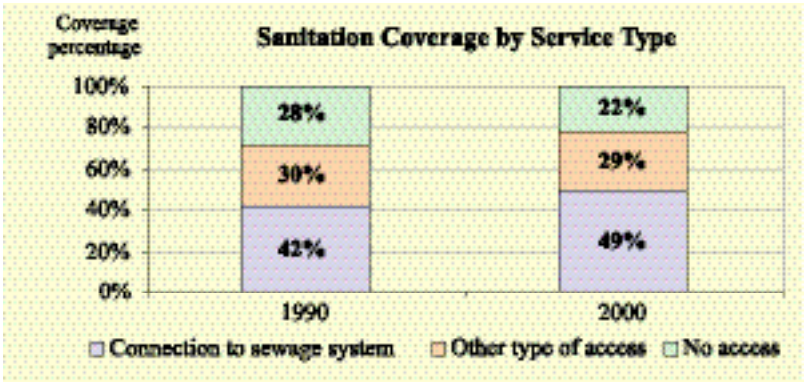
Inhabitants with Access (in thousands)	DRINKING WATER			SANITATION		
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL
1990	346.871	272.154	74.717	312.454	255.785	56.669
2000	442.949	360.806	82.143	400.563	333.703	66.860
Difference	**96.078**	**88.652**	**7.426**	**88.109**	**77.918**	**10.191**
Increase Percentage	**27,7%**	**32,6%**	**9,9%**	**28,2%**	**30,5%**	**18,0%**

The advances in sanitation experienced in the 90s have been significant, and slightly smaller than the expansion seen in drinking water coverage. The percentage of the population with access to improved sanitation went from 72% in 1990 to 78% in 2000. In absolute terms, the number of people with access to sanitation increased by 28%, with the addition of 88 million people.

In percentage terms, growth of coverage in rural sanitation was greater than that of urban coverage. Between 1990 and 2000 the percentage of urban population with access to improved sanitation increased from 84% to 86%, while the coverage percentage in rural areas grew from 43% to 53%, representing a coverage expansion of 2.1% and 22.4% respectively. This results from the increase in urbanization, and can be appreciated clearly when comparing percentage coverage data with increases in absolute figures.

The sanitation coverage increases achieved during the 90s required total investments in the sector in the amount of US$15 billion, of which 96% corresponds to investment in urban areas, and just 4% to rural area investment.

The quality of sanitation services also saw improvements. Almost 70 million people obtained access to sanitation services through a connection to a sewage system. This notwithstanding, the percentage of the population with this type of access continues to be low, representing 49% of the population total, and 63% of the population with access to improved sanitation.

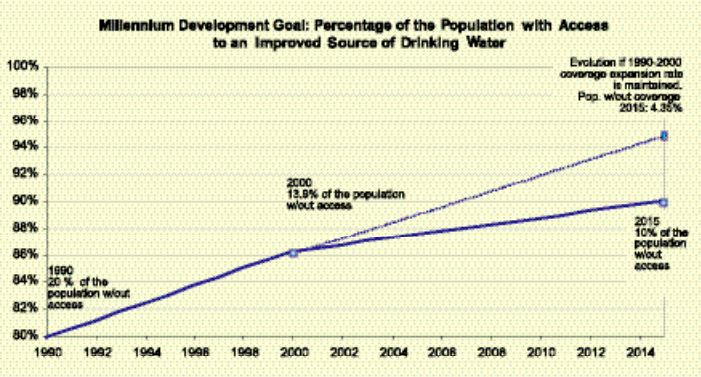


The disparities between urban and rural areas are very steep: while 70% of the urban population with access to sanitation is serviced by means of a connection to a sewage system, for rural areas this proportion is just 17.5%.

Chapter II
Access to Safe Drinking Water

This chapter analyzes access to safe drinking water among the region's population and includes the establishment of the number of people that have to be provided with drinking water at a subregional level and by country, as well as the amount of investment required in order to achieve the goals of reducing the number of people lacking coverage as approved in the Millennium Declaration.

As detailed in Appendix I, we have sought to provide consistency with the data bases in order to enable interregional and international comparisons, and have simplified the data sources. With respect to the concept of coverage, we stress that it has been defined as the percentage of the population that has access to a reasonable amount of water from an improved source.



This is understood as access to improved water from household connections, access to a public connection, protected water wells or springs, and the collection of rainwater. The sources of drinking water deemed unimproved are water from vendors, bottled water and water supplied by trucks; "reasonable access" means that each individual may consume at least 20 liters per day and that the source of water be located no farther than one kilometer from their home.[9]

With this view, which raises issues about its applicability in many countries in the region and about the need to link the concept of "connection to household distribution systems" to access to sources that are sustainable in the long term, it has been established that in 1990, 20% of the population in Latin America and the Caribbean lacked access to a reliable source of drinking water. This means that in order to meet the MDG by 2015 the percentage of the population without access to a reliable source of drinking water in the region should not exceed 10%. As a general concept and based on the population projections for the region, this implies that the number of people with access to an improved source of drinking water should increase from 443 million in 2000 to 562.7 million by 2015.

The analysis of the region's performance shows that given the significant progress seen during the 90s, in order to achieve the established objectives, it would suffice to maintain between 2000 and 2015 the pace of coverage expansion recorded during the 90s. Indeed, while between 1990 and 2000 an average of 9.6 million additional people per year were provided with drinking water coverage, in order to meet the reduction of population lacking access to drinking water set by the Millennium Declaration, it would suffice to provide drinking water service to 8 million new people per year between 2000 and 2015.

[9] Source: Global Water Supply and Sanitation Assessment 2000 Report.

However, it is important to verify the consistency of these figures at the subregional and country level, so initially we have assessed the investment needs at the regional level, based on the establishment of subregional groups defined in Chapter I and on average costs applicable to each of these subregions. Below we disaggregate the investment requirements by country. This data shall be the basis for the regional equality analysis included in Chapter IV.

REGIONAL ANALYSIS OF INVESTMENT NEEDS

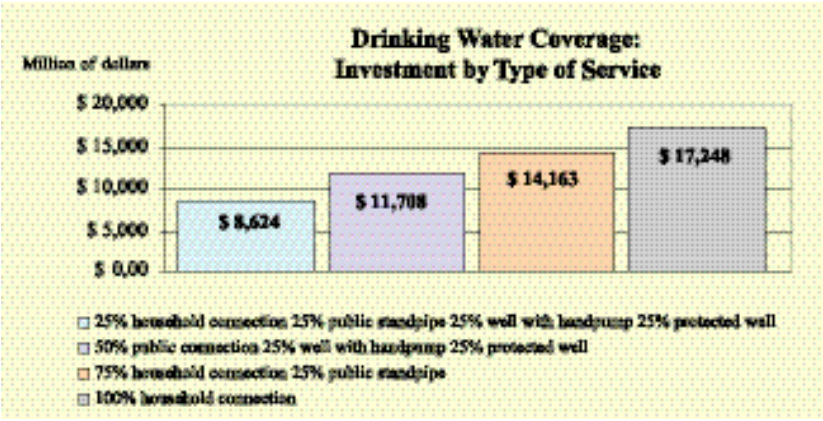
Average Construction Cost per Person 1990-2000 (US $)
Latin America and the Caribbean

Household Connection	$	144
Public Standpipe	$	41
Wells with Handpump	$	55
Protected Well (dug well)	$	48
Collection of Rainwater	$	36

In order to estimate the overall investment requirements for improving access to safe drinking water, first we consider the size of the market, employing population projections and coverage goals that show that between 2000 and 2015, 120 million additional people in the region must be provided with access. As "average investment costs" indicator and in order to estimate the regional investment needs, the figure employed is the average construction cost per person estimated by WHO/UNICEF in the Global assessment of drinking water and sanitation 2000.

It is important to consider that the estimated cost for expanding the water supply based on this data results in a net investment figure, as maintenance and repair of water systems other existing supply sources are not taken into account. These investments are essential for maintaining the level of service for the population who currently has access to a source of drinking water that is deemed safe. This is evident when comparing these costs and the average investment per inhabitant added between 1990 and 2000, of US$216 for urban areas and US$713 for rural areas.

In addition, the differences between the costs of the various types of supply imply that the result shall largely depend on the types of access to water that are built. Specifically, the cost of providing access through a household connection is triple that of systems considered of easy access (public standpipes, wells with handpumps, protected well), where users outside the home share the service.



According to the assumptions on the type of access to be used, the total investment amount needed to meet with the Millennium Development Goals ranges from US$8.6 billion (only 25% of new access through household connections) to US$17.3 billion (100% of new access by means of household connections.)

INVESTMENT NEEDS BY COUNTRY GROUPS

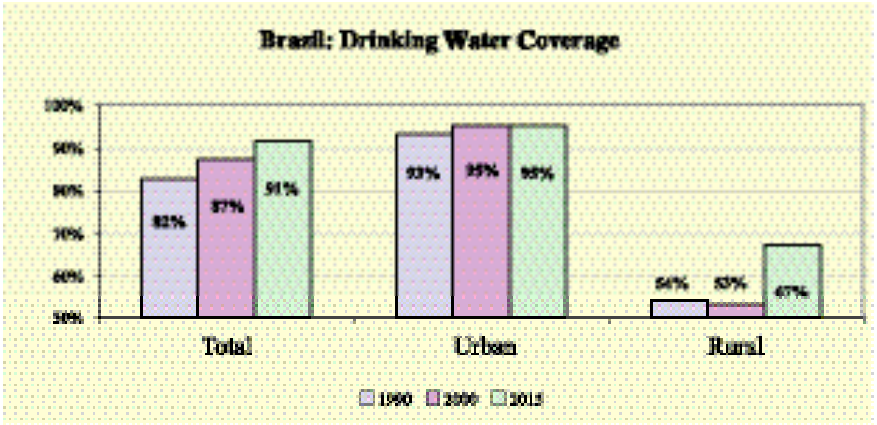
As a means of facilitating the comparison of conclusions from this survey with other similar studies and with much of the background data used as reference, we have adopted the criteria of regionalization and grouping employed by WHO/UNICEF in the regional chapter of the Global Water Supply and Sanitation Assessment 2000 Report[10] , detailed in the preceding chapter. The results for each of the country Groups in which the region has been divided are included in the following paragraphs.

Group I (Brazil and Mexico)

Brazil and Mexico represent 54% of the region's overall number of people who are to be provided with access to a source of drinking water in order to meet the Millennium Goals, totaling 56 million people in absolute terms. For purposes of assessing investment needs, it will be assumed that the added urban population will receive access by means of household connections, while the rural population shall receive access through wells (protected or with handpump), public connection or household connection, according to the current weightings for those types of services.

For purposes of distributing the number of people who are to be provided with a drinking water supply between the urban and rural population it is assumed that given the high urban coverage in both countries (95%) and the strong growth of the urban population projected for the following 15 years[11], urban coverage should remain at least constant, while the increase in rural coverage is calculated by subtraction.

Brazil



Brazil is the largest country in the region in terms of area and population. In 1990, 18% of Brazil's population lacked access to a source of drinking water. On this basis, the 50% reduction of the percentage of the population without water implies a goal for 2015 of 91% overall coverage. According to population projections, this means that 36 million additional people will have to be provided with an improved source of drinking water.

In this case, the population with access to drinking water grew at a steady pace between 1990 and 2000, adding coverage to 2.7 million people per year. This rate of expansion would allow to amply meet the established goals. In addition, it would not be necessary to increase the coverage growth rate, as supplying 2.4 million additional people with service would be enough to meet the goals. It should be noted that

[10] The original group numbering was altered due to the exclusion of the Group comprising the United States and Canada.

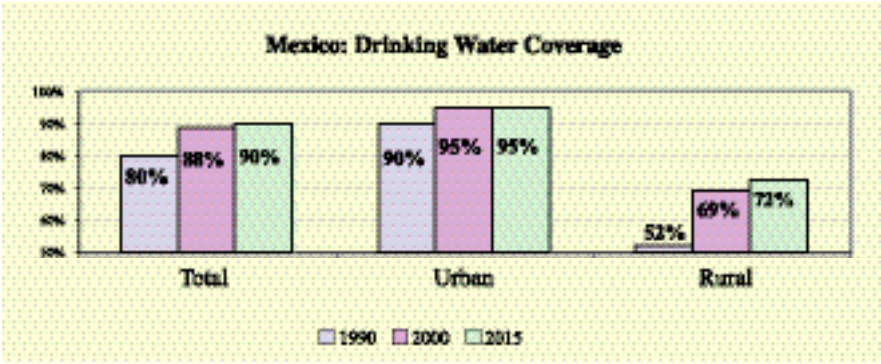
[11] In Brazil the percentage of urban population will increase from 81.3% in 2000 to 86.5% in 2015, an absolute increase in the urban population of 36 million people. Mexico's urban population is expected to grow 74.4% in 2000 to 77,9% by 2015, an urban population increase of 19 million people.

in relative terms, efforts should be focused to a larger extent on investing in rural areas.[12]

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	34.527	$ 152	$ 5.248
Rural Population	1.407	$ 130	$ 184
Total	35.934	$ 151	$ 5.432

With regards to the types of access, data from WHO/UNICEF's Assessment 2000 shows that 93% of the urban population with access to service had a household connection, while 7% had access from a public source. If the necessary investment is carried out, the percentage of the urban population with access to drinking water by means of a household connection will increase to 94.5%. Based on Brazil's average costs, the overall required investment is estimated at US$5.4 billion, or US$ 362 million per year.

Mexico



In 1990 20% of Mexico's 83 million inhabitants lacked access to an improved source of drinking water. In the following decade the country saw remarkable progress in coverage levels, reaching 88% of the total population. As a result, the investment required to reach the 90% coverage goal for 2015 shall be significantly lower than the amount allocated during the previous decade and meeting said goal should not pose significant difficulties for the country.

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	18.309	$ 172	$ 3.143
Rural Population	1.586	$ 170	$ 270
Total	19.895	$ 172	$ 3.412

In fact, while between 1990 and 2000 drinking water access was provided to an average of 2 million additional people per year, in order to meet the Millennium Development Goals 1.3 million new people \will have to be provided annually with a drinking water supply. Overall, 19.9 million new people must be provided with service, of which 18.3 million live in urban areas and 1.6 million in rural areas.

Based on the average estimated unit costs, the amount of investment required to meet the coverage goals is estimated at US$ 3.4 billion, or an annual investment of US$227 million between 2000 and 2015.

[12] Net investment in the rural sector during the 90s was negative, resulting in a reduction of coverage from 54% in 1990 to 53% in 2000, despite strong migration from rural to urban areas. While the rural population decreased by 20% between 1990 and 2000, the rate of population with access to drinking water fell 22%.

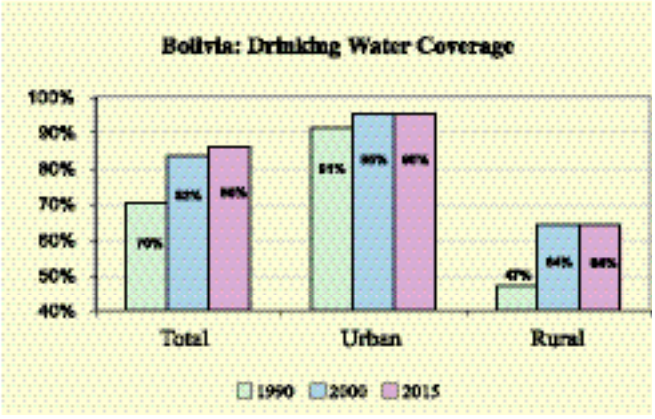
Group II (Bolivia, Colombia, Ecuador, Peru and Venezuela)

This Group presents relatively homogeneous coverage levels, with a minimum 80% for Ecuador and a maximum 91% in Venezuela. These are also developing countries with similar levels of GDP per capita.[13]

As detailed in Appendix II, the costs for these five countries have also been estimated at the regional level. In order to establish the investment needs it was assumed that all inhabitants added in urban areas would by provided with household connections. For rural area coverage it is assumed that the weightings of the various types of access shall remain constant between 2000 and 2015.

Bolivia

In 1990 the percentage of the population without access to an improved source of drinking water was 30%. In order to reduce that to 15% by 2015, investments are needed to cover an additional 2.6 million people. The investment plans put in place enabled coverage to reach 83.4% by 2000, very close to the 85% sought by the MDG. The investment was very high in relative terms for the country, averaging US$33 million per year.[14]



According to population and urbanization projections, between 2000 and 2015 the urban population shall increase by over 50%, while the rural population shall grow just 7.4%. Thus, if urban and rural coverage levels are kept constant, the set goals would be amply met. As a result, the goal for Bolivia has been reset so that urban and rural coverage levels remain constant. On this basis, the coverage goal for the country increases from 85% to 85.7%.

These goals imply adding service to 2.7 million people, of which 2.5 million reside in urban areas and 0.2 million in rural areas. Given the unit costs of the various types of access, this would require a total investment of US$240 million, or US$16 million per year, just half the rate of investment seen during the 90s. On the other hand, an annual average investment of US$26.5 million between 2000 and 2015 would achieve universal coverage for the country, totaling US$398 million in funds.

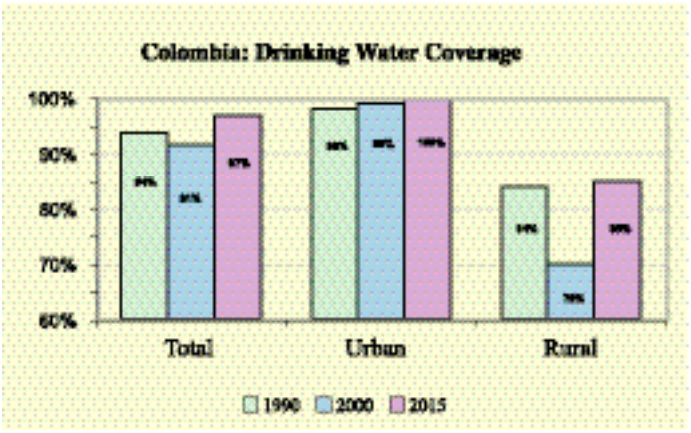
	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	2.526	$ 89	$ 225
Rural Population	148	$ 102	$ 15
Total	2.673	$ 90	***$ 240***

[13] The country with the lowest GDP per capita is Bolivia with US$2,500 (as of 2000) and the greatest GDP per cap-ita is Colombia's, at US$6,500

[14] Source: Analytical report from CEPIS-WHO. Data for 1992-1999.

Colombia

Colombia has the highest coverage level in this Group, as in 1990, 93.6% of the population had access to an improved source of drinking water. In contrast with the remaining countries in the Group and the region, between 1990 and 2000 drinking water coverage decreased, falling to 91,4%. This is probably the result of specific political problems that afflicted and continue to affect the country, as while urban coverage increased from 98% to 99%, rural coverage suffered a significant reduction, from 84% to 70% during said period.



In order to meet the Millennium Development Goals, Colombia must achieve a drinking water coverage level of 96.8% by 2015. In absolute terms, this means 12.8 million people will have to be provided with access to an improved source of drinking water. In terms of coverage distribution, it is estimated that 100% of the urban population and 85% of the rural inhabitants will be covered by 2015.

World Bank estimates as well as surveys performed by the government of Colombia[15] show that practically 100% of the population with access to drinking water has a household connection. Therefore, investment requirement estimates assume that only household connections will be added. Using the Group's average unit costs, the resulting amount to be invested is US$1.2 billion, or US$80 million per year between 2000 and 2015. An alternative way of estimating Colombia's investment needs is to directly use the costs provided by the country, as opposed to the Group average. These costs are 20% to 50% higher than the Group's average, and given that Colombia enjoys the highest technological development in this sector in the Group, it is reasonable to think that this is reflected in higher costs.

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	11.105	$ 89	$ 989
Rural Population	1.691	$ 124	$ 210
Total	12.797	$ 94	***$ 1.200***

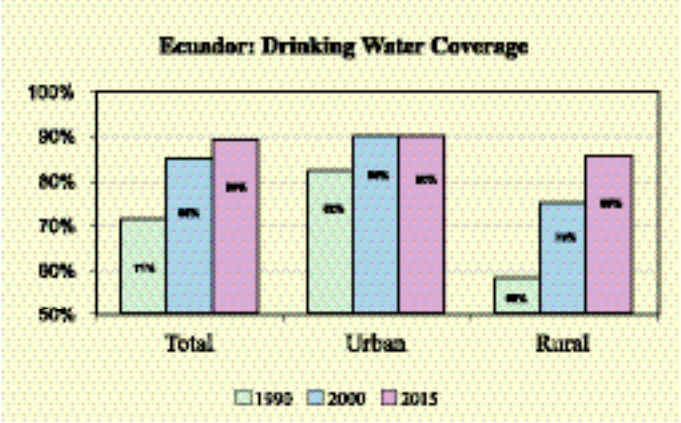
This method results in a total investment of US$1.7 billion, or US$115.4 million per year. Investment in urban areas amounts to almost US$1.5 billion and in rural areas totals US$ 254 million. This estimate of required amounts can be interpreted as the maximum level of investment required by Colombia.

[15] Global Water Supply and Sanitation Assessment 2000 and National Survey on demography and health (2000).

Ecuador

As is the case with Bolivia, Ecuador has experienced strong growth in drinking water service coverage during the 90s. The percentage of the population with access to a supply source of drinking water increased from 71% in 1990 to 85% in 2000. In order to meet with the MDG the country simply needs to add one percentage point to the coverage achieved in 2000, to reach 86%.

The number of people to be provided with drinking water service, according to the MDG falls below the current coverage in urban areas (90%), due to the significant urbanization process that Ecuador is expected to undergo between 2000 and 2015, when the urban population is expected to rise from 65.3% to 75.8%.



In order to meet the goal of reducing the number of people lacking access to drinking water with respect to 1990 levels, Ecuador should supply an additional 2.9 million people, but to keep constant the percentage of urban population without access it should add 3.4 million people. Thus, we will assess the investment necessary in order to keep the percentage of the urban population with coverage at constant levels, such as was done in the case of Bolivia.

An exodus from rural to urban areas is expected in such magnitude that the rural population is seen falling in absolute terms from 4.4 million people in 2000, to 3.86 million in 2015. Thus, maintenance investment in rural coverage would increase coverage levels from 75% to 85%. Under this premise, the Millennium Development Goals would be amply met, reaching coverage levels of 88.9%.

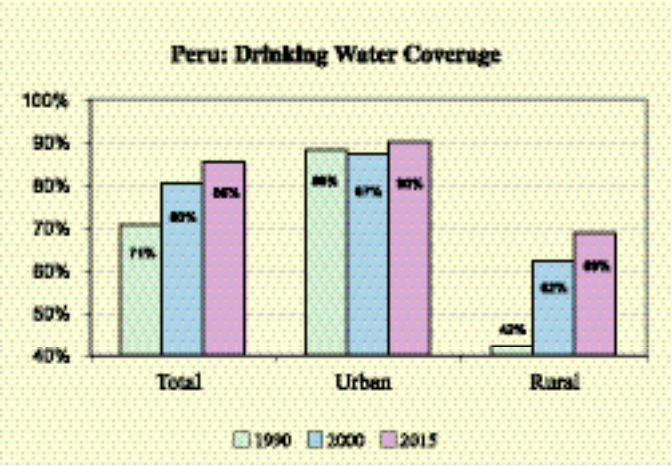
In absolute terms, this means that investments will have to be undertaken in order to supply 3.4 million additional people with drinking water, which based on the Group's average costs, will require overall investments worth US$306 million, or US$20.4 per year.

If we apply the same criteria employed in the case of Colombia, of using the average local costs of providing household service, as opposed to the average regional cost, the required investment would total US$488.4 million.

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	3.439	$ 89	$ 306
Rural Population	0	$ -	$ -
Total	3.439	$ 89	***$ 306***

Peru

In 1990 29.4% of Peru's population lacked access to a reliable supply of drinking water. This means that by 2015 the country's goal is to achieve coverage for 85.3% of its population.



Between 1990 and 2000 the population with access to drinking water increased from 70.6% to 80%. On average, over 500,000 additional people were provided drinking water coverage per year. The most significant increase happened in rural areas, where coverage rose from 42% to 62%. The percentage of the urban population with access to a source of drinking water slightly decreased, due to the rise in urban population from 62% in 1990 to 73% in 2000.

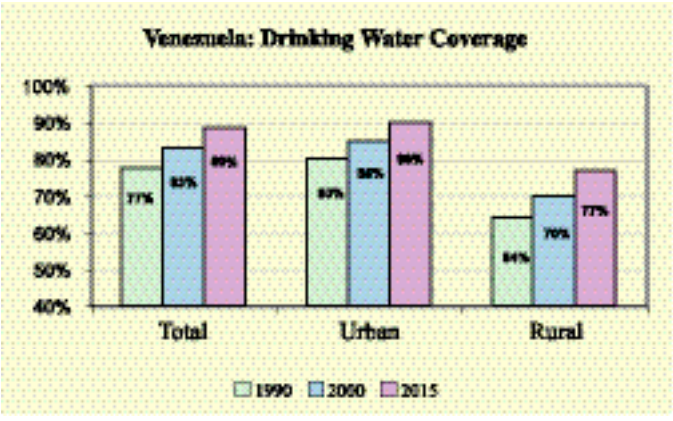
Peru has to provide an additional 6.5 million people with access to drinking water if the country is to meet the goal of reducing by 50% the population without access to the service. This means providing service to 431,000 additional people per year, only slightly above the expansion figures recorded during the 90s.

In assessing the investment amount required to meet this goal, the rural coverage was projected to increase from 62% to 69%, while urban coverage increases by three percentage points to 90% by 2015. Based on these projections it is estimated that between 2000 and 2015 Peru will have to invest US$578 million, or US$38.5 million per year. The amount to be invested significantly decreases if the country's per capita costs are used, instead of employing the region's average costs. The total figure would amount to US$252 million, or US$17 million per year.

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	5.987	$ 89	$ 533
Rural Population	478	$ 93	$ 45
Total	6.465	$ 89	$ 578

Venezuela

In 2000 17% of Venezuela's population lacked access to a reliable source of drinking water. In order to meet the MDG this percentage must fall to 11.3%, implying a 50% reduction of the population who did not have access to drinking water in 1990, which stood at 22.6%.



Between 1990 and 2000 drinking water coverage increased from 77% to 83%. On average, 498.000 people per year were provided a source of drinking water, implying that maintenance of the investment flow allocated to drinking water supply

would suffice in order to meet the country's goal, which provide for the addition of 487,500 people per year, totaling 7.3 million people through 2015.

In order to estimate the required investment, urban coverage was projected to increase from 85% to 90%, while rural coverage is seen reaching 77%. The resulting investment amount, calculated at regional average costs, totals US$655 millions, implying an average annual investment of US$43.7 million.

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	7,158	$ 89	$ 638
Rural Population	155	$ 115	$ 18
Total	7,313	$ 90	$ 655

Group III (Argentina, Chile, Paraguay and Uruguay)

Argentina

Argentina shows relatively high percentages of population lacking access to drinking water in relation to its income levels. In 1990 35% of the population did not have access to drinking water. This percentage fell significantly during the 90s, reaching 21% by 2000. In order to meet the 50% reduction goal by 2015, 82.6% of the population must have drinking water supply coverage. Despite the significant gap reduction experienced between 1990 and 2000, strong inequalities persist between urban and rural areas. In 2000, 85% of the urban population had access to a reliable supply of drinking water, while in rural areas coverage was just 64%.

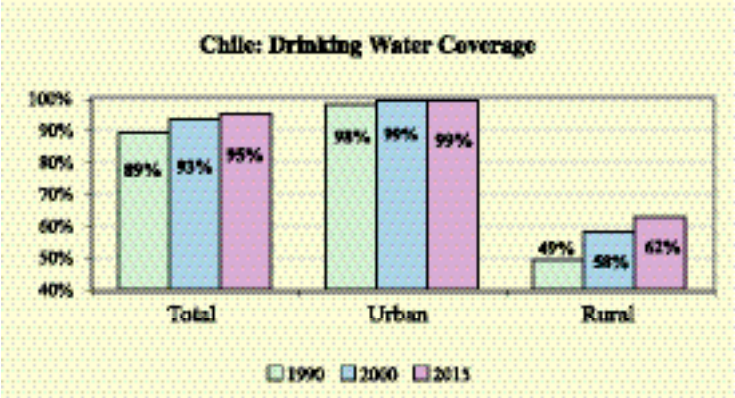
In order to estimate the capital requirements involved in meeting the Millennium goals, urban coverage is projected to increase to 86% from 85%, while rural coverage would rise from 64% to 65%. In terms of inhabitants to be provided with access to a reliable supply of drinking water, these goals mean that 6.5 million additional people will have to be covered, 6.34 million of whom reside in urban areas, and only 185.000 of whom are rural dwellers.

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	6,342	$ 184	$ 1,165
Rural Population	185	$ 186	$ 34
Total	6,527	$ 184	$ 1,199

Based on regional average costs, Argentina would have to invest US$1.2 billion, or US$80 million per year between 2000 and 2015.

Chile

In order to meet the Millennium Development Goals, Chile should provide 94.7% of its population with coverage to drinking water by 2015.



Chile exhibits almost complete urban coverage, while in rural areas the percentage of the population with access to a reliable supply of drinking water is barely 58%.

The growth of population with access to drinking water experienced between 1990 and 2000 was driven by growth in urban coverage, which rose from 82.4% to 85.7%. Coverage in rural areas grew by 9 percentage points.

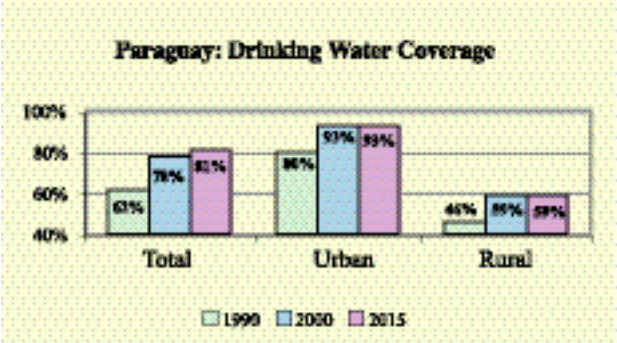
Because growth in urban population will be exacerbated in coming years[16], the number of people to be provided coverage as per the Millennium Development Goals is lower than the actual number required in order to maintain urban coverage at 2000 levels. Thus, it is necessary to increase the overall coverage level to 95.1% in order to maintain urban coverage levels. To do so, 2.8 million additional people will have to be provided with access to drinking water supply. For the rural population, the goal established is 62% coverage, in order to at least keep constant the number of people with access by 2015.

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	2,823	$ 184	$ 518
Rural Population	0	$ 184	$ -
Total	2,823	$ 184	**$ 518**

Based on the region's average costs, meeting these goals would imply investments in the amount of US$518 million between 2000 and 2015, an annual average of US$35 million. It should be noted that the National Plan of the Ministry of Public Works projects significant coverage increases, especially in rural areas, where the goal set is 100% by 2010, 70% through household connections and 30% by means of an acceptable individual system.

Paraguay

Paraguay is the country with the lowest coverage indicators in the Group. In 1990, only 62% of the population had access to a reliable supply of drinking water. As was the case throughout Latin America, during the 90s coverage increased significantly, reaching 78% in 2000. In order to meet the Millennium Declaration Goal, coverage should reach 81%. This means providing access to an additional 2 million people.



[16] By 2015 89% of the Chilean population is expected to live in urban centers.

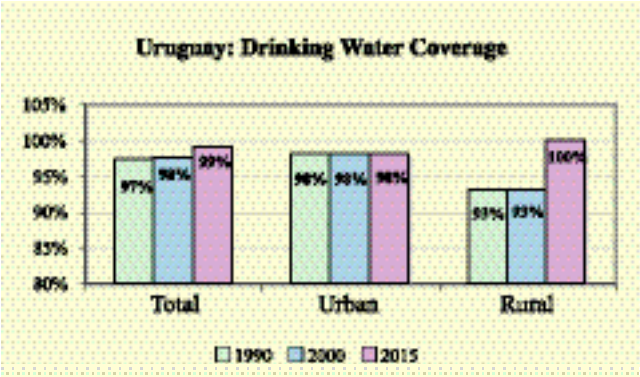
Paraguay's population is expected to concentrate further in urban centers by 2015, implying that in order to meet the Millennium Development Goals, the country would just have to maintain coverage for urban and rural areas at 2000 levels. Because by 2015 the urban population will have a heavier weighting, the coverage goal of 81% would be met.[17]

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	1,837	$ 184	$ 337
Rural Population	178	$ 186	$ 33
Total	2,015	$ 184	$ 370

Paraguay needs to invest US$370 million, US$25 per year, in order to meet its goals.

Uruguay

The percentage of Uruguay's population with access to a reliable source of drinking water is high, spanning almost its entire population. By 1997 it was already at 97%, reaching 98% by 2000. The country doesn't show significant inequalities between urban and rural populations either, maintaining the gap seen during the 90s. The percentage of rural dwellers with access to drinking water increased from 42% in 1990 to 62% by 2000.



In order to meet the Millennium Development Goals it must achieve 99% coverage by 2015. Given the country's internal migration toward urban areas, the goal was adjusted so as to maintain urban coverage at constant levels, without allowing a drop in the number of rural inhabitants with access. Thus, the overall goal for the country will be slightly overachieved.[18]

Because Uruguay is a small country in demographic terms, with high coverage in drinking water, the number of additional people to provide with service and the resulting investment amount is low compared with the other countries in the Group. To achieve its goals, Uruguay will have to provide access to drinking water to an additional 391,000 people, requiring investments for a total of US$72 million.

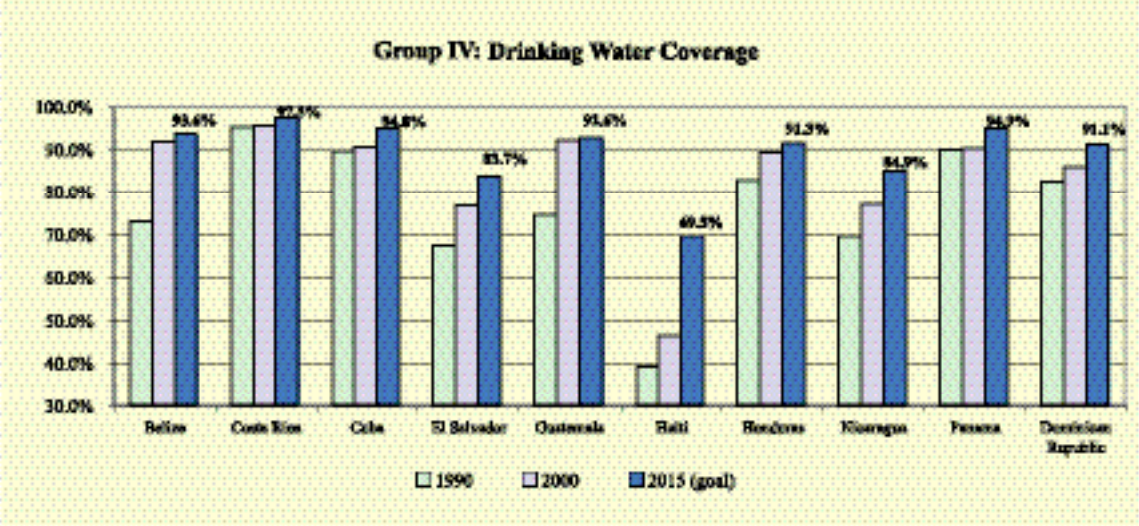
	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	391	$ 184	$ 72
Rural Population	0	$ 183	$ -
Total	391	$ 184	$ 72

Group IV (Belize, Costa Rica, Cuba, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama and Dominican Republic)

In terms of drinking water access the Group is highly heterogeneous. In 2000, 54% of Haiti's population did not have access to a reliable supply of drinking water, the lowest levels in the region, while at the other end are countries such as Belize and Guatemala, with coverage levels of 95.3% and 92% respectively.

[17] Actually, maintaining urban and rural coverage, Paraguay's target will be slightly overachieved at 81.1%, against an actual goal of 80.9%.
[18] Total coverage achieved would be 99.1% and the goal is 98.7%.

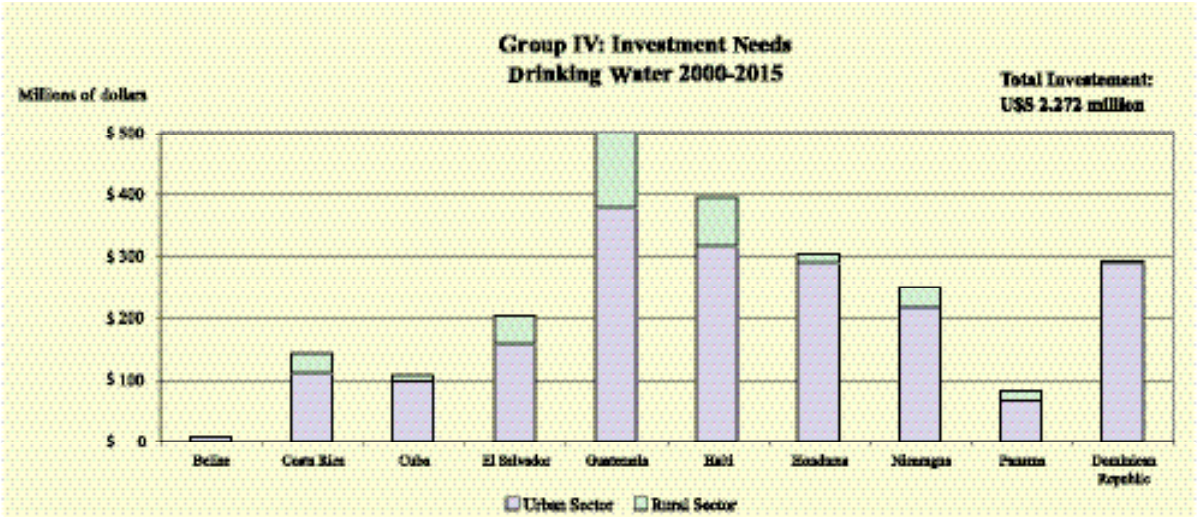
The Group, like the rest of Latin America, showed great improvement during the 90s. While in 1990 Group coverage amounted to 75.5%, in 2000 it reached 82.2%. The countries that recorded the greatest coverage increases are Belize and Guatemala, both exceeding by 2000 their 2015 goals as per the Millennium Declaration.



Coverage goals for each country were set so as to reduce by 50% the population without access to drnking water based on the coverage recorded in 1990. For Guatemala and Belize goals were reset in order to maintain both urban and rural coverage at constant levels.[19] The total number of inhabitants to be provided with access between 2000 and 2015 is 20.14 million, with 5 million of them located in urban areas and 15.14 million in rural areas.

Based on the region's average costs, it is estimated that the Group will need to invest a total US$2.3 billion, or US$151 million per year.

[19] Per the Millenium Development Goal, Belize should reach an overall coverage rate of 86.5% in 2015, but by 2000 91.8% of the population had access to drnking water. In order to keep coverage at constant levels in rural and urban areas the goal for 2015 was set at 93,6%.
Guatemala achieved 92% coverage in 2000, while its Millenium Development Goal of 87.2%. The percentage of overall coverage Guatemala needs to attain in order to maintain constant its urban and rural coverage is 92.6%.

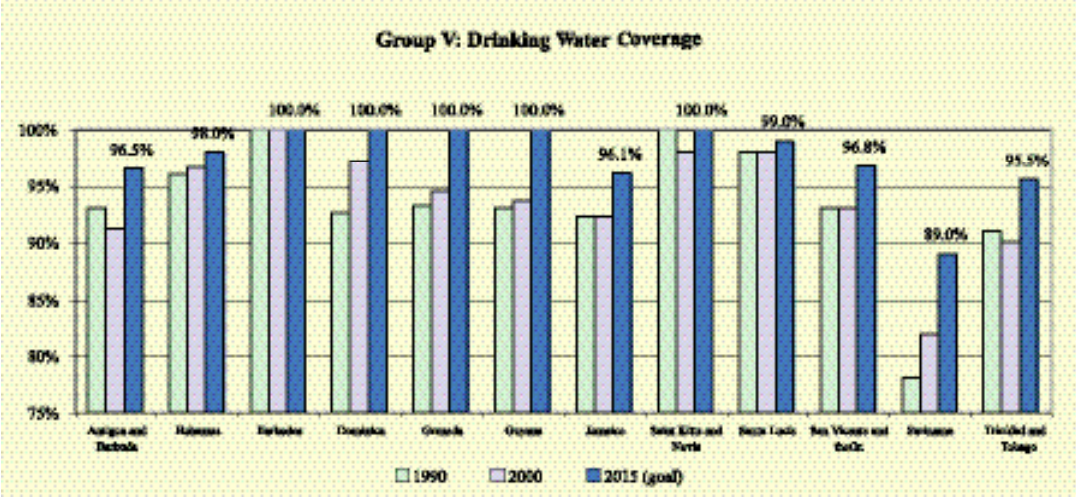


Country	Urban Sector			Rural Sector			TOTAL (millions of US$)
	N° of People (in millions)	Unit Cost	Total (millions of US$)	N° of people (in millions)	Unit Cost	Total (millions of US$)	
Belize	61	$ 126	$ 7.7	0	$ 76	$ -	$ 8
Costa Rica	862	$ 126	$ 109.0	403	$ 81	$ 32.5	$ 141
Cuba	764	$ 126	$ 96.6	130	$ 66	$ 8.5	$ 105
El Salvador	1,230	$ 126	$ 155.5	637	$ 72	$ 45.7	$ 201
Guatemala	2,989	$ 126	$ 377.9	1,716	$ 72	$ 124.4	$ 502
Haiti	2,495	$ 126	$ 315.5	1,169	$ 67	$ 78.4	$ 394
Honduras	2,278	$ 126	$ 288.0	182	$ 81	$ 14.8	$ 303
Nicaragua	1,702	$ 126	$ 215.2	518	$ 63	$ 32.5	$ 248
Panama	516	$ 126	$ 65.3	180	$ 80	$ 14.5	$ 80
Dominican Republic	2,286	$ 126	$ 289.0	19	$ 59	$ 1.1	$ 290
TOTAL	**15,185**		**$ 1,920**	**4,954**		**$ 352**	**$ 2,272**

Group V (Antigua and Barbuda, Bahamas, Barbados, Dominica, Grenada, Guyana, Jamaica, Saint Christopher-Nevis, Saint Lucia, Saint Vincent and the Grenadines, Surinam and Trinidad and Tobago)

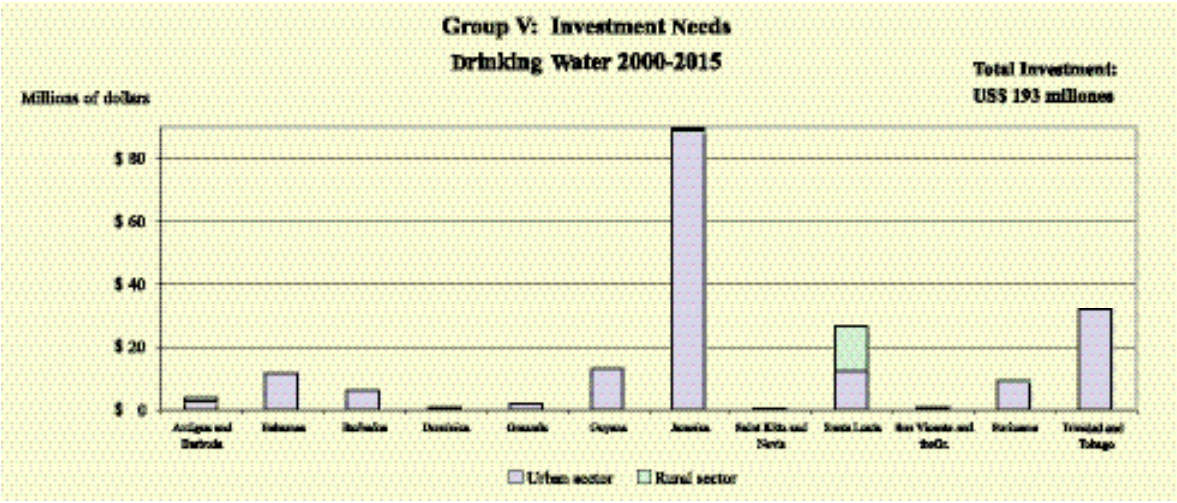
Because the joint population of these countries is under 7 million, the analysis has been done for the group as a whole. In 1990 this Group already averaged 92% coverage. In contrast with other countries in the region, advances were not so significant during the 90s. Many countries did not expand their coverage, and in Antigua and Barbuda, Saint Christopher-Nevis and Trinidad and Tobago the percentage of the population with access to drinking water actually fell. Thus, for several countries[20] the coverage goal for 2015 was changed so as to keep constant coverage the levels for the urban population.

[20] Barbados, Dominica, Grenada, Guyana, Saint Cristopher-Nevis and Saint Vicent and the Grenadines.

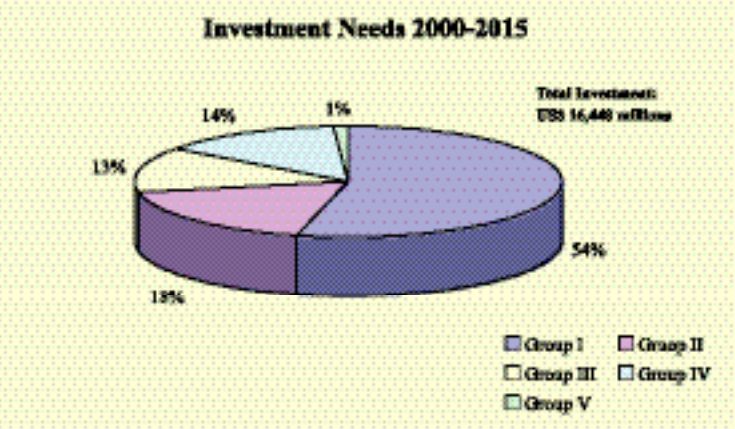


The total number of people to be provided with drinking water access is under a million (989,000) and the total investment amount required to reach this goal is US$193 million, or US$13 million per year. The country requiring the greatest investment is Jamaica (US$89 million).

Country	Urban Sector			Rural Sector			TOTAL (millions of US$)
	N° of people (in millions)	Unit cost	Total (millions of US$)	N° of people (in millions)	Unit Cost	Total (millions of US$)	
Antigua and Barbuda	12	$ 192	$ 2.3	5	$ 250	$ 1.3	$ 4
Bahamas	58	$ 192	$ 11.1	0	$ 255	$ -	$ 11
Barbados	30	$ 192	$ 5.8	0	$ 262	$ -	$ 6
Dominica	3	$ 192	$ 0.5	0	$ 224	$ -	$ 1
Granada	10	$ 192	$ 1.9	0	$ 242	$ -	$ 2
Guyana	67	$ 192	$ 12.9	0	$ 248	$ -	$ 13
Jamaica	462	$ 192	$ 88.7	3	$ 197	$ 0.7	$ 89
Saint Kitts and Nevis	1	$ 192	$ 0.2	0	$ 234	$ -	$ 0
Santa Lucia	63	$ 192	$ 12.0	59	$ 237	$ 14.0	$ 26
San Vicente and theGr.	4	$ 192	$ 0.8	0	$ 239	$ -	$ 1
Suriname	47	$ 192	$ 9.0	1	$ 218	$ 0.2	$ 9
Trinidad and Tobago	165	$ 192	$ 31.7	0	$ 237	$ -	$ 32
TOTAL	**921**		**$ 177**	**68**		**$ 16**	**$ 193**



GENERAL CONCLUSIONS



Regional results obtained by aggregating the countries and/or Groups in Latin America and the Caribbean are in line with initial estimates. In order to meet the goal of reducing by 50% the number of people without access to drinking water, the region will have to provide access to 121.4 million people. This will require US$16.5 billion in investments by 2015, or o US$1.1 billion per year between 2000 and 2015, with Brazil and Mexico accounting for over 50% of the total funds required in the region. Of this amount 93% is allocated to urban areas and 7% to rural areas. The average cost of providing an individual with access is US$135.50.

In terms of necessary investment, Group I is followed by II, comprised of Bolivia, Colombia, Ecuador, Peru and Venezuela, and by Group IV, made up of Central American and Spanish-speaking Caribbean countries. Although these countries must undertake significant investments in absolute terms, relative to their GDP there are other countries that require larger efforts. While in Brazil and Mexico the projected investment represents only 0.9% and 0.6% of their respective GDP[21], the funds required for Nicaragua to meet its coverage goals represent 12% of GDP, while in Haiti they equal 10%.

[21] Based on 2001 GDP figures (World Bank).

Drinking Water: Goals and Investment Needs by Country

	Coverage		Goal 2015		Cost per Person	Investment Needs			Aditional per Equality (millions)	Investment Needs with Equality		
	1990	2000	Coverage	Population Number (thousands)		2000-2015 (millions)	Annual (millions)	Regional Participation		2000-2015 (millions)	Annual (millions)	Regional Participation
Group I	82%	88%	91%	55,829	$ 158	$ 8,844	$ 590	$ -	$ -	$ 8,844	$ 590	50%
Brasil	82%	87%	91%	35,934	$ 151	$ 5,432	$ 362	$ -	$ -	$ 5,432	$ 362	31%
Mexico	80%	88%	90%	19,895	$ 172	$ 3,412	$ 227	$ -	$ -	$ 3,412	$ 227	19%
Group II	81%	86%	91%	32,687	$ 91	$ 2,979	$ 199	$ 235	$ 235	$ 3,214	$ 214	18%
Bolivia*	70%	83%	86%	2,673	$ 90	$ 240	$ 16	$ 44	$ 44	$ 284	$ 19	2%
Colombia	94%	91%	97%	12,797	$ 94	$ 1,200	$ 80	$ -	$ -	$ 1,200	$ 80	7%
Ecuador*	71%	85%	89%	3,439	$ 89	$ 306	$ 20	$ 16	$ 16	$ 323	$ 22	2%
Peru	71%	80%	85%	6,465	$ 89	$ 578	$ 39	$ 137	$ 137	$ 715	$ 48	4%
Venezuela	77%	83%	89%	7,313	$ 90	$ 655	$ 44	$ 37	$ 37	$ 692	$ 46	4%
Group III	73%	84%	86%	11,756	$ 184	$ 2,160	$ 144	$ 715	$ 715	$ 2,875	$ 192	16%
Argentina	65%	79%	83%	6,527	$ 184	$ 1,199	$ 80	$ 588	$ 588	$ 1,787	$ 119	10%
Chile*	89%	93%	95%	2,823	$ 184	$ 518	$ 35	$ -	$ -	$ 518	$ 35	3%
Paraguay	62%	78%	81%	2,015	$ 184	$ 370	$ 25	$ 127	$ 127	$ 497	$ 33	3%
Uruguay	97%	98%	99%	391	$ 184	$ 72	$ 5	$ -	$ -	$ 72	$ 5	0%
Group IV	75%	82%	88%	20,139	$ 113	$ 2,272	$ 151	$ 349	$ 349	$ 2,621	$ 175	15%
Belize*	73%	92%	94%	61	$ 126	$ 8	$ 1	$ -	$ -	$ 8	$ 1	0%
Costa Rica	95%	95%	97%	1,265	$ 112	$ 141	$ 9	$ -	$ -	$ 141	$ 9	1%
Cuba	90%	91%	95%	894	$ 118	$ 105	$ 7	$ -	$ -	$ 105	$ 7	1%
El Salvador	67%	77%	84%	1,867	$ 108	$ 201	$ 13	$ 57	$ 57	$ 258	$ 17	1%
Guatemala*	75%	92%	93%	4,705	$ 107	$ 502	$ 33	$ -	$ -	$ 502	$ 33	3%
Haiti	39%	46%	70%	3,664	$ 107	$ 394	$ 26	$ 250	$ 250	$ 644	$ 43	4%
Hondures	83%	89%	91%	2,461	$ 123	$ 303	$ 20	$ -	$ -	$ 303	$ 20	2%
Nicaragua	70%	77%	85%	2,220	$ 112	$ 248	$ 17	$ 42	$ 42	$ 290	$ 19	2%
Panama	90%	90%	95%	697	$ 115	$ 80	$ 5	$ -	$ -	$ 80	$ 5	0%
Dominican Republic	82%	86%	91%	2,305	$ 126	$ 290	$ 19	$ -	$ -	$ 290	$ 19	2%
Group V	92%	92%	96%	989	$ 195	$ 193	$ 13	$ 1	$ 1	$ 194	$ 13	1%
Antigua and Barbuda	93%	91%	96%	17	$ 210	$ 4	$ 0	$ -	$ -	$ 4	$ 0	0%
Bahamas	96%	97%	98%	58	$ 192	$ 11	$ 1	$ -	$ -	$ 11	$ 1	0%
Barbados*	100%	100%	100%	30	$ 192	$ 6	$ 0	$ -	$ -	$ 6	$ 0	0%
Dominica*	93%	97%	100%	3	$ 192	$ 1	$ 0	$ -	$ -	$ 1	$ 0	0%
Grenada*	93%	95%	100%	10	$ 192	$ 2	$ 0	$ -	$ -	$ 2	$ 0	0%
Guyana*	93%	94%	100%	67	$ 192	$ 13	$ 1	$ -	$ -	$ 13	$ 1	0%
Jamaica	92%	92%	96%	465	$ 192	$ 89	$ 6	$ -	$ -	$ 89	$ 6	1%
San Kitts and Nevis	100%	98%	100%	1	$ 192	$ 0	$ 0	$ -	$ -	$ 0	$ 0	0%
Santa Lucía	98%	98%	99%	122	$ 214	$ 26	$ 2	$ -	$ -	$ 26	$ 2	0%
San Vicent and Grenadinas*	93%	93%	97%	4	$ 192	$ 1	$ 0	$ -	$ -	$ 1	$ 0	0%
Suriname	78%	82%	89%	48	$ 193	$ 9	$ 1	$ 1	$ 1	$ 10	$ 1	0%
Trinidad and Tobago	91%	90%	96%	165	$ 192	$ 32	$ 2	$ -	$ -	$ 32	$ 2	0%
Latin America and the Caribbean	80%	86%	90%	121,399	$ 135	$ 16,448	$ 1,097	$ 1,300	$ 1,300	$ 17,748	$ 1,183	100%

*The goals of these countries have been changed according to what is described in the chapter

Chapter III
Access to Improved Sanitation

This chapter refers basically to the analysis of the region's population's access to improved sanitation services and includes the corresponding assessment of the number of people whose access to these services must be improved at the subregional and country level in Latin America and the Caribbean, as well as the investment amounts needed in order to achieve the goals of reducing the percentage of the population without coverage assumed as indicators of the MDG as stated in the Millennium Declaration.

Chapters III and IV of this document repeat the scheme applied previously for safe drinking water, but addressing sanitation service for the region, an aspect of urban infrastructure that the United Nations has defined as a relevant variable in measuring the improvement of quality of life in shantytowns, adding a few considerations to the issue of waste water treatment that are directly related to quality of life in urban centers and with the social goals linked to sustainable development.

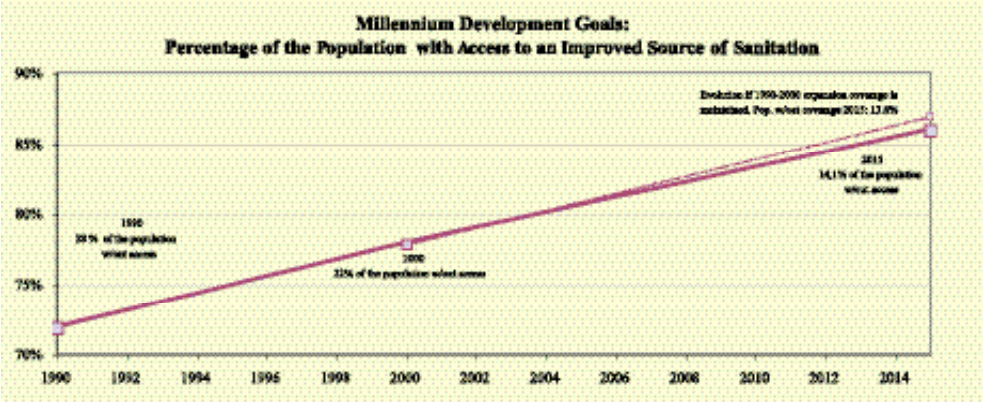
In this regard, as an element included in the goal of "achieving by 2020 a significant improvement in the lives of at least 100 million people living in shantytowns" the variable of "proportion of urban population with access to improved sanitation services" has been added. The Application of the Millennium Declaration shows that in order to verify its compliance, the indicator to be used is "the reduction by 2015 of 50% of the population lacking access to sanitation."

In addition, as a result of adding goals that may be relevant for the region and related to the goal of considerably improving by 2020 the lives of 100 million inhabitants of shantytowns, the supplementary goal of reducing by 2015 "the population without access to systems of treatment or final disposition of waste water" has been included.

The access to improved sanitation services that has been defined consistently with United Nations criteria, includes as population adequately served, the ones with household connection to a public sewage system, with connection to a septic tank, latrine with water discharge, dry latrine and simple bored-hole latrine. Technologies deemed not improved are public latrines and/or latrines that do not adequately separate excretions from human contact. This view may fall short of the service usually conceived for sanitation in Latin America. To a larger degree than in access to a supply of safe drinking water, the definition of "improved sanitation" raises a debatable issue concerning its applicability in many countries in the region, together with the need of adding the concept of "household connection to sewage systems" for urban centers of a certain size, and linking it to treatment and final disposal of waste water as sustainable development measures for the sector.

However, if the necessary conditions for reducing by 50% the population without access to improved sanitation are analyzed, overall coverage in the region must increase from the 72% recorded on the base year, to 86% by 2015, implying investments for the addition of service for 138 million people.

A retrospective study shows that during the 90s on average 8.8 million new people per year were provided with service, implying that in order to meet the specified goal by 2015 an average of 9.2 million new people per year would have to be provided with service. However, if the coverage expansion rate recorded in the 90s were maintained, by 2015 the coverage goals would be exceeded.



ANALYSIS OF REGIONAL INVESTMENT NEEDS

In order to quantify the overall capital to be allocated in order to meet the coverage goals specified as the MDG variable for the whole region, and then analyze the specific investment needs by country and/or group, the average investment per inhabitant has been estimated based on data from the Global Assessment for Drinking Water and Sanitation 2000 (WHO/UNICEF) accounting for different sanitation access technologies.

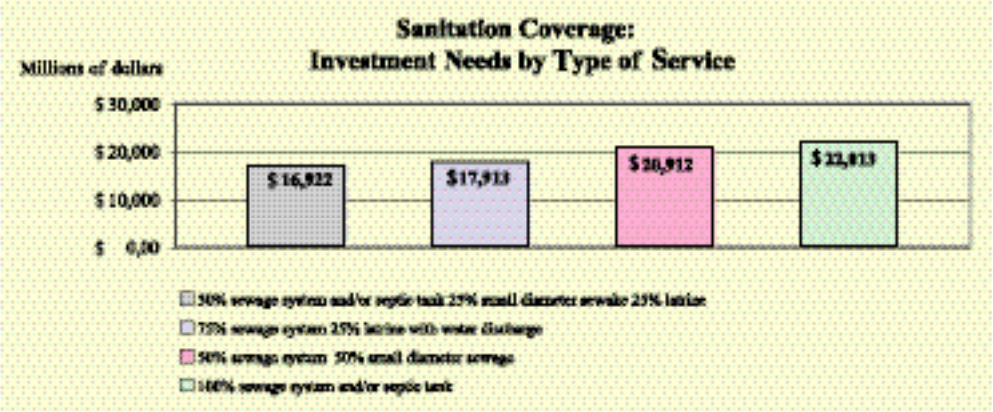
Average Construction Cost per Person 1990-2000 (US$)
Latin America and the Caribbean

Connection to a Sewage System	$	160
Small Diameter Sewage	$	112
Septic Tank	$	160
Latrine with Water Discharge	$	60
Dry Latrine	$	52
Simple Bored-Hole Latrine	$	60

Source: Global Water Supply and Sanitation Assessment 2000

These figures adopted as "average construction costs" are used to estimate the investment amount required in order to reduce by 50% the population lacking access to an improved source of sanitation in Latin America and the Caribbean.

The broad difference between the cost of sewage and septic tank on the one hand, and latrines on the other, means that investment requirements vary significantly according to the quality of improved sanitation system chosen for implementation.



Given the higher "average costs" and the larger number of people to be provided with sanitation as compared with drinking water, investment needs in sanitation are between 27% and 95% higher than in drinking water supply, varying according to the quality of service to be provided[22]. These estimates only include new sources of access to improved sanitation, and consequently may underestimate fund allocations required for meeting the stated objectives of enabling sustainable access to service for societies in the long term. This is because these estimates do not take into account the investment required for maintaining in good working order sewage and other access systems, so that currently covered people will maintain their level of service.

INVESTMENT NEEDS BY COUNTRY GROUPS

In order to facilitate comparison of this study's conclusions with other similar surveys and with the various background data used as reference, we adopted the regionalization and grouping criteria used by WHO/UNICEF in its Regional Report on Assessment 2000 for the Americas Region[23], detailed in Chapter I. The results for each of the region's country Groups have been included.

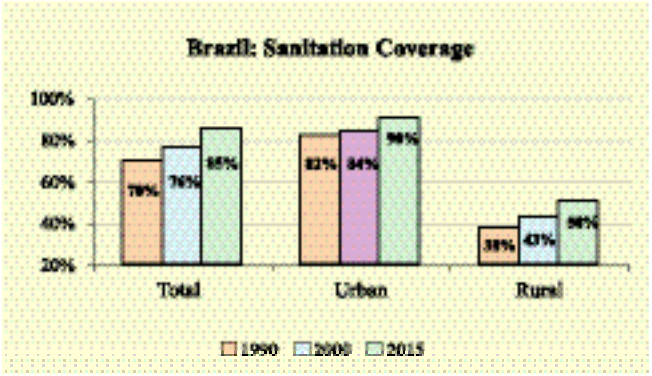
Group I (Brazil and Mexico)

The relative importance of these two countries within the overall regional assessment should be stressed. If the goal of reducing by 50% the percentage of Latin American and Caribbean people lacking improved sanitation service is to be met, over 70 million new people will have to be provided with service in Brazil and Mexico alone. This represents over half the total inhabitants to receive new access in order to meet the Millennium Development Goals throughout the region.

[22] The 27% difference in investment needs corresponds to higher service levels (100% household connections for drinking water and 100% connection to sewage system), while the greatest differences occur at the lowest service quality levels.
[23] The original group numbering was altered due to the exclusion of the Group comprising the United States and Canada.

Brazil

In 1990, 30% of Brazil's population (44.3 million people) lacked access to improved sanitation. This percentage must fall to 15% by 2015. Between 1990 and 2000, the country recorded significant progress in coverage levels of sanitation services. Over said period, 2.65 million additional people were serviced annually and the coverage rate increased from 70% to 76%. But in order to meet the 85% coverage target, Brazil will have to add service to 42 million people, or 2.8 million per year, a figure that implies the tremendous challenge of maintaining over the long term the investment levels associated to this coverage demand.

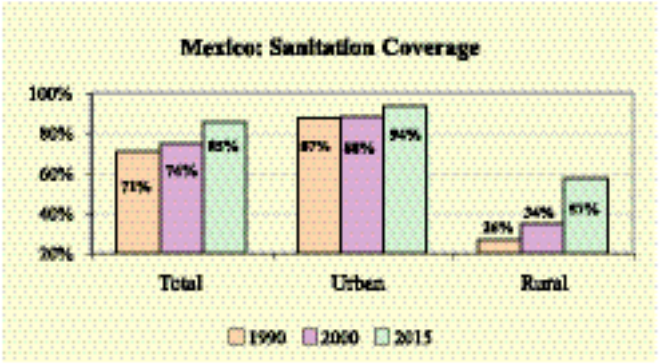


Based on the average costs of various types of service, it is estimated that in order to achieve the coverage levels required for meeting its goals, Brazil shall have to invest in this subsector a total of US$8.8 billion, or US$600 million per year.[24]

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	41.888	$ 210	$ 8.796
Rural Population	0	$ 74	$ -
Total	41.888	$ 210	$ *8.796*

Mexico

In 1990, 71% of Mexicans in the country lacked access to sanitation, while the country has to achieve a coverage rate of 85.5% in order to meet its Millennium Development Goals by 2015. Over the following decade the country added coverage for 1.5 million people per year, achieving a 74% coverage rate by 2000.



In order to meet with the 85.5% final target, Mexico will have to provide access to an additional 28.5 million people, an expansion rate of almost 2 million people per year over 15 years. Meeting this really ambitious goal implies investing US$3.4 billion, or almost US$230 million per year on average.

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	22.066	$ 139	$ 3.077
Rural Population	6.437	$ 52	$ 332
Total	28.503	$ 120	$ *3.409*

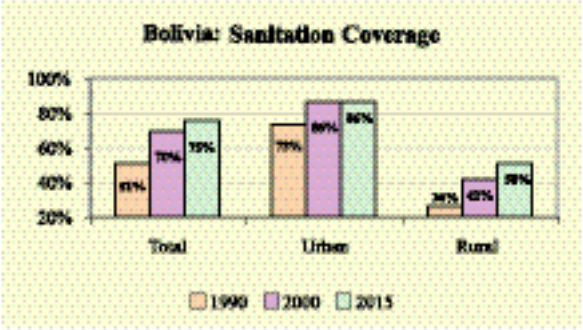
[24] Just like in the case with drinking water investment, in this case it is assumed that new connections shall be household connections in urban areas (seweage areas) while new access for rural populations would keep constant the weightings of household connections and other access types (septic tanks, latrines) as of 2000.

Group II (Bolivia, Colombia, Ecuador, Peru and Venezuela)

At the beginning of the 90s, this Group showed considerably diverse levels of coverage. Bolivia and Peru stood at around 50% and Ecuador and Venezuela recorded levels similar to the Group's average of 70%, while Colombia clearly exceeded the regional average, providing 83% of its population with improved sanitation services. This disparity was maintained through 2000, when the Group's expansion rate acquired the pace necessary for meeting with the overall goal. Ecuador, Peru and Bolivia are close to meeting their 2015 targets. Colombia and Venezuela have stagnated and their numbers for the decade are far from satisfactory, resulting in assessments that deem achievement of their goals as "difficult to comply with."

Bolivia

In 1990 only 50% of the population of Bolivia had access to improved sanitation, placing the country at the bottom of this Group. During the 90s coverage increased to almost 70%. Bolivia's target according to the Millennium Development Goals is 75% coverage by 2015. Given the country's demographic growth projections, this means providing access to 177,000 additional people per year. In contrast, between 1990 and 2000 new access was provided to an average of 246,000 per year.

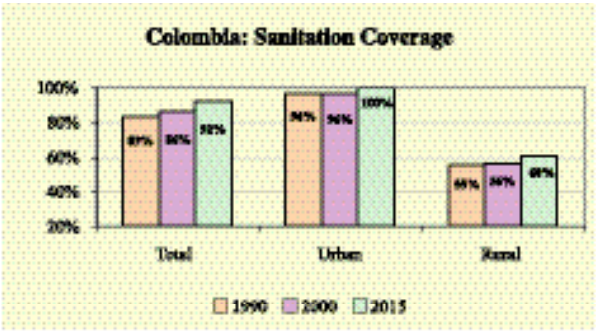


Based on the average costs for Group II, Bolivia would require investments in an amount of US$262 million, o US$17.4 million per year.

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	2,286	$ 102	$ 233
Rural Population	376	$ 75	$ 28
Total	2,663	$ 98	***$ 262***

Colombia

Colombia already had a relatively high sanitation coverage level by 1990 (83.2%), the highest in the Group. In order to meet the Millennium Development Goals, the country has to provide new access to 12.5 million people, achieving coverage for 92% of its population.

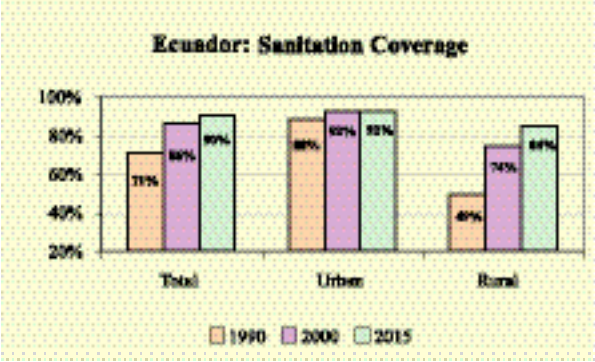


In order to reach this goal the country should invest a total of US$1,3 billion.

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	12,044	$ 102	$ 1,229
Rural Population	469	$ 118	$ 55
Total	12,512	$ 103	***$ 1,285***

Ecuador

In this country, 70.6% of the population had access to improved sanitation in 1990 and in 2000 coverage reached 85.8%, exceeding its Millennium Development Goal of 85.3%. Thus, for purposes of this survey the target was modified, employing a coverage rate that would ensure constant coverage of urban areas. Contrary to what could be surmised based on the preceding data, achieving this target would demand significant investments, due to the heavy growth of Ecuador's urban population[25].

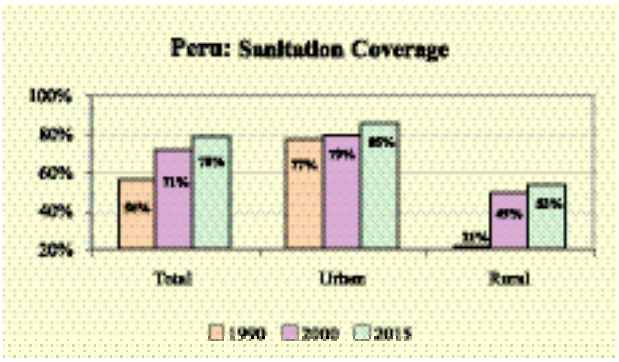


The restated coverage target implies providing access to improved sanitation to an additional 3.5 million people, requiring US$359 million in funds.

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	3,516	$ 102	$ 359
Rural Population	0	$ 85	$ -
Total	3,516	$ 102	**$ 359**

Peru

Peru managed to significantly increase its sanitation coverage during the 90s, rising from 56% in 1990 to almost 71% in 2000. Peru's Millennium Development Goal for improved sanitation involves achieving 78% coverage, which implies providing access to 6.5 million additional people, a figure deemed viable on account of a past performance that significantly exceeded the average expansion numbers required to meet the country's goals.



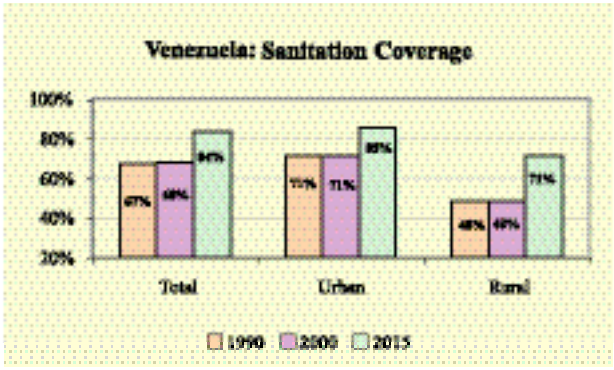
Based on the average costs for the Group, the total funds to be invested are estimated at US$665 million, or US$44.3 million per year.

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	6,252	$ 102	$ 638
Rural Population	276	$ 97	$ 27
Total	6,528	$ 102	**$ 665**

[25] While in 2000 urban dwellers accounted for 65.3% of the population, by 2015 they are expected to reach 75.8%.

Venezuela

Unlike the other countries in the Group, in Venezuela sanitation coverage remained practically unchanged between 1990 and 2000, both for the country as a whole, as in rural and urban areas, while investment in the sector barely followed population growth. In order to achieve its Millennium Development Goal, Venezuela must show 84% coverage by 2015.



This implies providing access to an additional 9.4 million people, a significant challenge based on its average coverage expansion during the 90s, at 332,500 people per year. In order to reach this target, Venezuela should invest US$964 million, or US$64 million per year.

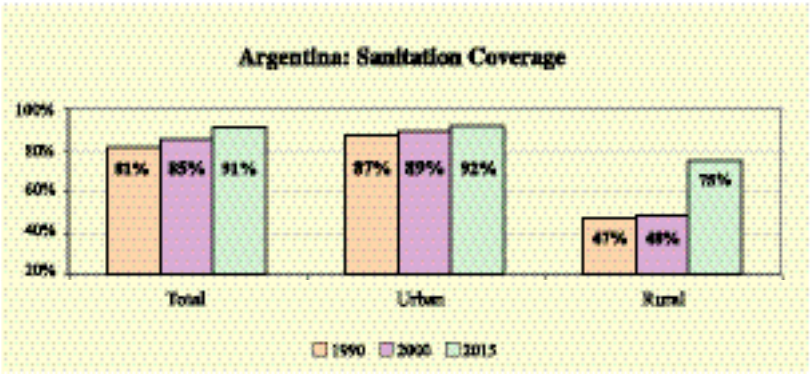
	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	8,709	$ 102	$ 889
Rural Population	673	$ 112	$ 75
Total	9,382	$ 103	***$ 964***

Group III (Argentina, Chile, Paraguay and Uruguay)

This Group, with the exception of Argentina, shows extremely high coverage levels, at around 95% since 1990, which calls into question the applicability of generalized goals for Latin America and the relevance of the "improved sanitation" concept that is applied globally.

Argentina

In 1990 this country showed 81% coverage, significantly below the Group's average. After a decade of strong change in the sector, coverage barely reached 85%, implying that if Argentina is to meet its target, it will have to provide access to an additional 8 million people by 2015. This means that although during the 90s an average of 492,000 additional people were provided with service per year, in order to achieve its Millennium Development Goal the pace of investment would have to increase, adding coverage to an average of 536,000 people per year between 2000 and 2015.



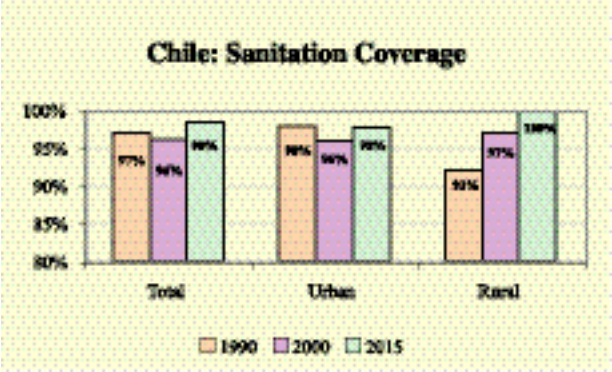
Based on the Group's average costs weighted for Argentina, this target demands investing a total of US$2.1 billion, or US$141 million annually.

	Number of people (in thousands)	Average cost (in US$)	Amount of investments (in US$)
Urban Population	7,427	$ 278	$ 2,067
Rural Population	619	$ 73	$ 45
Total	8,046	$ 262	***$ 2,112***

Chile

By 1990, 97% of Chile's population had access to improved sanitation. Between 1990 and 2000 coverage fell slightly, as population growth, at 16%, exceeded the 15% expansion recorded for improved sanitation. Chile's Millennium Development target calls for providing coverage to 98.5% of the population by 2015, implying the addition of service for 3 million people.

The total amount of investment required for reaching this goal is US$839 million.

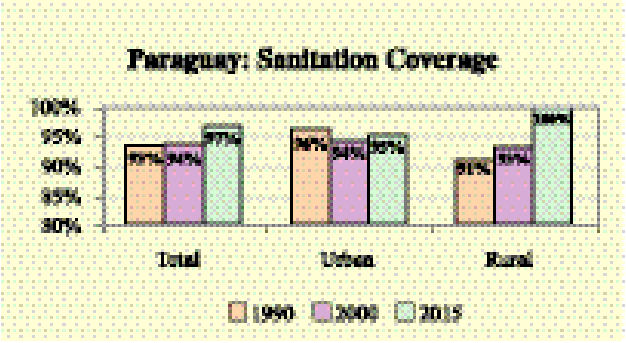


	Number of people (in thousands)	Average cost (in US$)	Amount of investments (in US$)
Urban Population	3,014	$ 278	$ 839
Rural Population	0	$ 208	$ -
Total	3,014	$ 278	*$ 839*

Paraguay

In order to meet the Millennium Development Goal, Paraguay must increase the percentage of population with access to improved sanitation from the 93.3% recorded in 1990 to 96.7% by 2015. During the 1990-2000 period the country practically showed no coverage expansion, and in order to achieve its targets it would have to triple its past investment rate, so as to provide 2.4 million additional people with service.

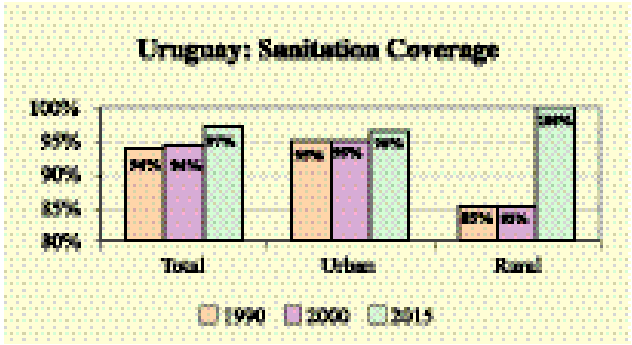
This target requires investments in a total amount of US$561 million, or US$37 million per year.



	Number of people (in thousands)	Average cost (in US$)	Amount of investments (in US$)
Urban Population	1,907	$ 278	$ 531
Rural Population	464	$ 65	$ 30
Total	2,371	$ 236	*$ 561*

Uruguay

In 1990 and 2000 Uruguay's sanitation coverage stood at 94%. In order to meet its Millennium Development Goal, the percentage of the population with improved sanitation must reach 97% by 2015, implying the provision of new access to 426,000 people.



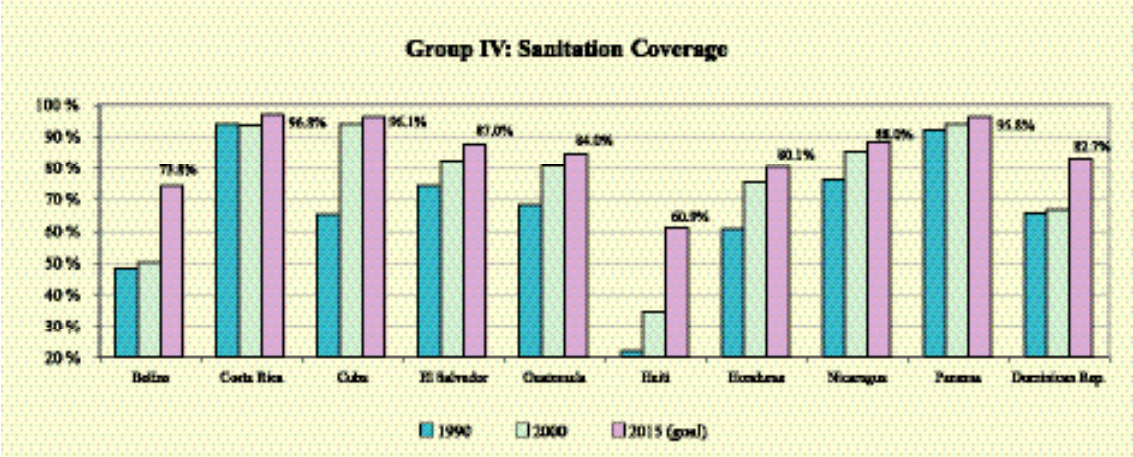
The required investment in order to achieve this goal totals US$119 million.

	Number of People (in thousands)	Average Cost (in US$)	Amount of Investments (in US$)
Urban Population	426	$ 278	$ 119
Rural Population	0	$ 74	$ -
Total	426	$ 278	*$ 119*

Group IV (Belize, Costa Rica, Cuba, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama and Dominican Republic)

In 1990 this Group of countries showed an average coverage level of 64%. There were broad differences among the coverage rates of the various countries: while Haiti barely provided 22% of its population with improved sanitation services, in Costa Rica the rate was 93.6%.

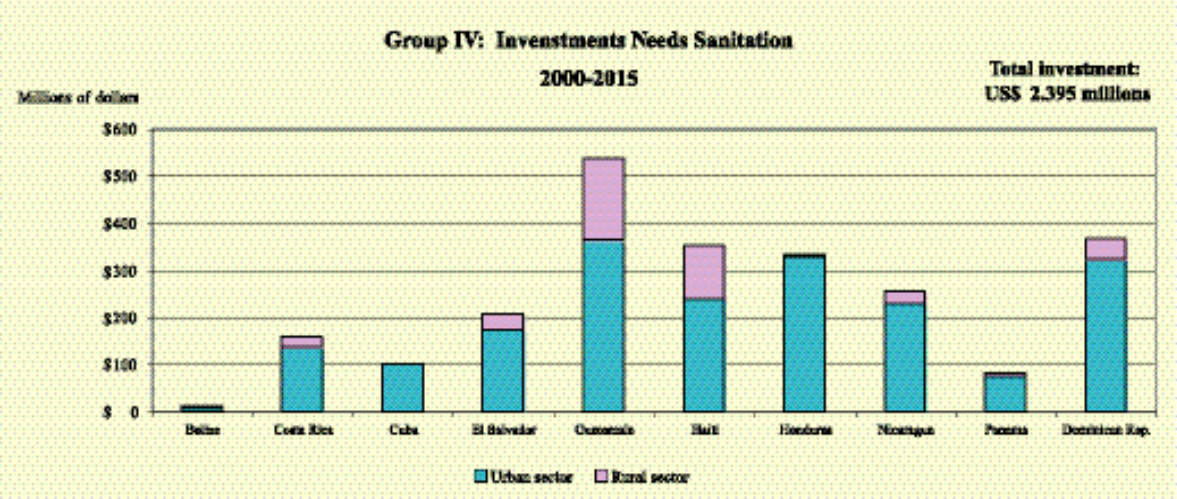
During the 90s almost all the countries experienced significant increases in the percentage of population covered by sanitation services[26]. In 2000 the average sanitation coverage exceeded 76%. If the Group achieves the Millennium Development Goals, by 2015 it will show an average coverage of 84%.



The goals were calculated as to reduce by 50% the percentage of the population lacking access to improved sanitation as compared to the 1990 rate. The only exception is Cuba, which already exceeded its Millennium Development Target in 2000[27]. In this case, the goal employed was an overall coverage rate that enables the service level in rural and urban areas to remain constant.

According to these targets and to the population growth projections, the total number of people to be provided with improved sanitation between 2000 and 2015 is 20.3 million, with some 13.7 million living in urban areas and 6.6 million in rural areas. The cost of this expansion is assessed at US$2.4 billion, or US$160 million per year.

[26] The only exception is Costa Rica, where coverage fell from 93.6% in 1990 to 93.2% in 2000.
[27] From its 65% covrage in 1990, the goal of reducing by 50% the percentage of the population lacking coverage resulted in a target of 82.5% coverage for 2015. But according to available data, Cuba had already exceeded 90% coverage in 2000.



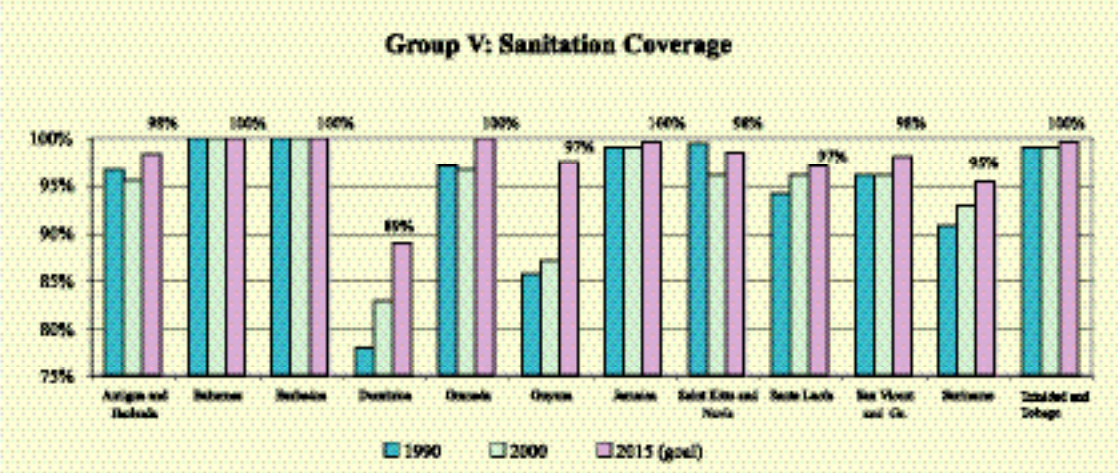
Country	Urban Sector			Rural Sector			TOTAL (millions of US$)
	N° of People (in millions)	Unit Cost	Total (millions of US$)	N° of People (in millions)	Unit Cost	Total (millions of US$)	
Belize	51	$ 144	$ 7.3	48	$ 55	$ 2.7	$ 10
Costa Rica	943	$ 144	$ 135.7	374	$ 57	$ 21.2	$ 157
Cuba	687	$ 144	$ 98.9	0	$ 68	$ -	$ 99
El Salvador	1,203	$ 144	$ 173.1	590	$ 55	$ 32.5	$ 206
Guatemala	2,531	$ 144	$ 364.4	2,054	$ 83	$ 171.4	$ 536
Haiti	1,655	$ 144	$ 238.2	2,076	$ 55	$ 114.4	$ 353
Honduras	2,288	$ 144	$ 329.3	93	$ 55	$ 5.1	$ 334
Nicaragua	1,589	$ 144	$ 228.6	459	$ 55	$ 25.3	$ 254
Panama	516	$ 144	$ 74.3	112	$ 56	$ 6.2	$ 81
Dominican Republic	2,241	$ 144	$ 322.6	804	$ 55	$ 44.3	$ 367
TOTAL	**13,704**		**$ 1,972**	**6,610**		**$ 423**	**$ 2,395**

Group V (Antigua and Barbuda, Bahamas, Barbados, Dominica, Grenada, Guyana, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Surinam and Trinidad and Tobago)

This Group shows very high coverage rates for sanitation, much like its situation with respect to drinking water. In 1990 the average coverage recorded was 96%, increasing to 96.8% by 2000. The country with the lowest coverage in the region is Dominica, at 89% as of 2000.

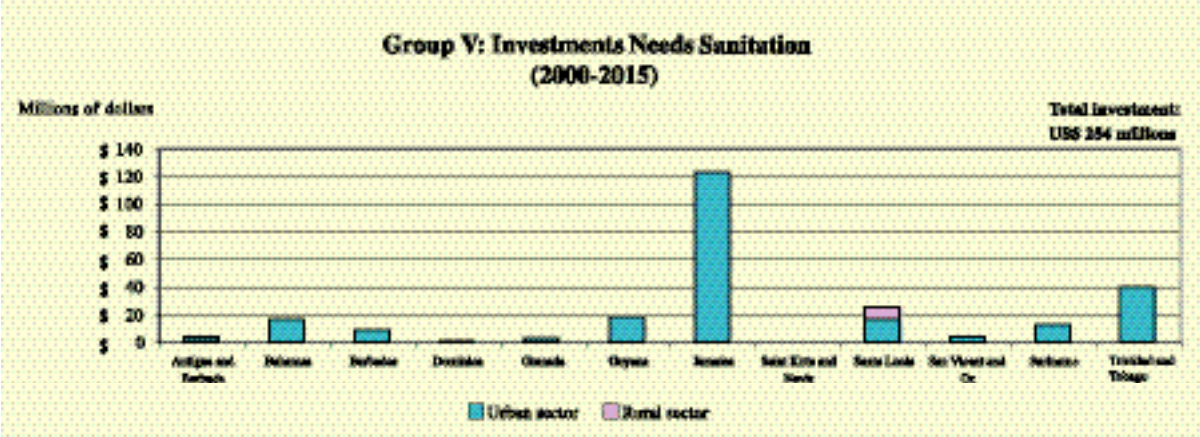
The targets arising from the Millennium Declaration criteria were modified for most of the countries in the Group[28] in an effort to maintain coverage in urban areas at constant levels.

[28] The exceptions are Antigua and Barbuda, Dominica and Santa Lucía.



In order to meet these coverage targets, the countries in the Group will have to provide improved sanitation to an additional 955,000 people, of whom 891,000 are urban dwellers and 254,000 live in rural areas. This will require investing US$254 million.

Within the Group, Jamaica will require the largest investment, at US$123 million, followed by Trinidad and Tobago, requiring US$39 million.



Country	Urban Sector			Rural Sector			TOTAL (millions of US$)
	N° of People (in millions)	Unit Cost	Total (millions of US$)	N° of People (in millions)	Unit Cost	Total (millions of US$)	
Antigua and Barbuda	11	$ 274	$ 3.1	5	$ 132	$ 0.6	$ 4
Bahamas	59	$ 274	$ 16.2	0	$ 139	$ -	$ 16
Barbados	30	$ 274	$ 8.3	0	$ 134	$ -	$ 8
Dominica	3	$ 274	$ 1.0	0	$ 130	$ -	$ 1
Granada	10	$ 274	$ 2.7	0	$ 130	$ -	$ 3
Guyana	67	$ 274	$ 18.2	0	$ 130	$ -	$ 18
Jamaica	447	$ 274	$ 122.7	0	$ 202	$ -	$ 123
Saint Kitts and Nevis	1	$ 274	$ 0.2	0	$ 130	$ -	$ 0
Santa Lucía	59	$ 274	$ 16.2	60	$ 147	$ 8.8	$ 25
San Vicente and the Gr.	13	$ 274	$ 3.7	0	$ 137	$ -	$ 4
Suriname	46	$ 274	$ 12.6	0	$ 130	$ -	$ 13
Trinidad and Tobago	144	$ 274	$ 39.4	0	$ 130	$ -	$ 39
TOTAL	**891**		**$ 244**	**65**		**$ 9**	**$ 254**

GENERAL CONCLUSIONS

According to the estimates, achieving the Millennium Development Goals for improved sanitation service will require investing a total US$22 billion between 2000 and 2015. This implies an average of approximately US$1.5 billion per year, practically 50% more than the amount required to meet the targets for drinking water. Of these funds, 95% will be allocated to providing improved sanitation service to the urban population, and the remaining 5% to rural population service.

The number of people to be provided with service totals 140 million, 15% greater than the number to be provided with drinking water service, at an average cost of US$157 per person.

Group I (Brazil and Mexico) requires the greatest investment efforts, followed by Group III (Argentina, Chile, Paraguay and Uruguay) and Group II (Bolivia, Colombia, Ecuador, Peru, and Venezuela). In relative terms, Haiti and Nicaragua face the greatest efforts, just like in drinking water coverage. In the case of Haiti, the investment required to achieve the Millennium Development Goals in sanitation represent 8.8% of its GDP, while in the case of Nicaragua they represent 12% of the country's GDP.

Sanitation: Goals and Investment Needs by Country

	Coverage		Goal 2015		Cost per Person	Investment Needs			Additional per Equality (millions)	Investment Needs with Equality		
	1990	2000	Coverage	Population Number (thousands)		2000-2015 (millions)	Annual (millions)	Regional Participation		2000-2015 (millions)	Annual (millions)	Regional Participation
Group I	70%	76%	85%	70,391	$ 173	$ 12,206	$ 814	55%	$ 612	$ 12,818	$ 855	54%
Brazil	70%	76%	85%	41,888	$ 210	$ 8,796	$ 586	40%	$ 439	$ 9,235	$ 616	39%
Mexico	71%	74%	85%	28,503	$ 120	$ 3,409	$ 227	15%	$ 174	$ 3,583	$ 239	15%
Group II	70%	77%	85%	34,601	$ 102	$ 3,535	$ 236	16%	$ 485	$ 4,020	$ 268	17%
Bolivia*	51%	70%	75%	2,663	$ 98	$ 262	$ 17	1%	$ 126	$ 387	$ 26	2%
Colombia	83%	86%	92%	12,512	$ 103	$ 1,285	$ 86	6%	$ -	$ 1,285	$ 86	5%
Ecuador*	71%	86%	90%	3,516	$ 102	$ 359	$ 24	2%	$ -	$ 359	$ 24	2%
Peru	56%	71%	78%	6,528	$ 102	$ 665	$ 44	3%	$ 275	$ 940	$ 63	4%
Venezuela	67%	68%	84%	9,382	$ 103	$ 964	$ 64	4%	$ 85	$ 1,050	$ 70	4%
Group III	87%	89%	94%	13,857	$ 262	$ 3,629	$ 242	16%	$ -	$ 3,629	$ 242	15%
Argentina	81%	85%	91%	8,046	$ 262	$ 2,112	$ 141	10%	$ -	$ 2,112	$ 141	9%
Chile*	97%	96%	98%	3,014	$ 278	$ 839	$ 56	4%	$ -	$ 839	$ 56	4%
Paraguay	93%	94%	97%	2,371	$ 236	$ 561	$ 37	3%	$ -	$ 561	$ 37	2%
Uruguay	94%	94%	97%	426	$ 278	$ 119	$ 8	1%	$ -	$ 119	$ 8	1%
Group IV	64%	76%	84%	20,314	$ 118	$ 2,395	$ 160	11%	$ 485	$ 2,880	$ 192	12%
Belize*	48%	50%	74%	99	$ 101	$ 10	$ 1	0%	$ 4	$ 14	$ 1	0%
Costa Rica	94%	93%	97%	1,317	$ 119	$ 157	$ 10	1%	$ -	$ 157	$ 10	1%
Cuba	65%	94%	96%	687	$ 144	$ 99	$ 7	0%	$ -	$ 99	$ 7	0%
El Salvador	74%	82%	87%	1,793	$ 115	$ 206	$ 14	1%	$ -	$ 206	$ 14	1%
Guatemala*	68%	81%	84%	4,586	$ 117	$ 536	$ 36	2%	$ 45	$ 580	$ 39	2%
Haiti	22%	34%	61%	3,731	$ 95	$ 353	$ 24	2%	$ 325	$ 678	$ 45	3%
Honduras	60%	75%	80%	2,381	$ 140	$ 334	$ 22	2%	$ 66	$ 400	$ 27	2%
Nicaragua	76%	85%	88%	2,047	$ 124	$ 254	$ 17	1%	$ -	$ 254	$ 17	1%
Panama	92%	94%	96%	629	$ 128	$ 81	$ 5	0%	$ -	$ 81	$ 5	0%
Dominican Republic	65%	67%	83%	3,045	$ 120	$ 367	$ 24	2%	$ 45	$ 411	$ 27	2%
Group V	96%	97%	99%	955	$ 266	$ 254	$ 17	1%	$ -	$ 254	$ 17	1%
Antigua and Barbuda	97%	95%	98%	16	$ 234	$ 4	$ 0	0%	$ -	$ 4	$ 0	0%
Bahamas	100%	100%	100%	59	$ 274	$ 16	$ 1	0%	$ -	$ 16	$ 1	0%
Barbados*	100%	100%	100%	30	$ 274	$ 8	$ 1	0%	$ -	$ 8	$ 1	0%
Dominica*	78%	83%	89%	3	$ 274	$ 1	$ 0	0%	$ -	$ 1	$ 0	0%
Granada*	97%	97%	100%	10	$ 274	$ 3	$ 0	0%	$ -	$ 3	$ 0	0%
Guyana*	86%	87%	97%	67	$ 274	$ 18	$ 1	0%	$ -	$ 18	$ 1	0%
Jamaica	99%	99%	100%	447	$ 274	$ 123	$ 8	1%	$ -	$ 123	$ 8	1%
San Kitts and Nevis	99%	96%	98%	1	$ 274	$ 0	$ 0	0%	$ -	$ 0	$ 0	0%
Santa Lucia	94%	96%	97%	119	$ 210	$ 25	$ 2	0%	$ -	$ 25	$ 2	0%
San Vicent and Grenadines*	96%	96%	98%	13	$ 274	$ 4	$ 0	0%	$ -	$ 4	$ 0	0%
Suriname	91%	93%	93%	46	$ 274	$ 13	$ 1	0%	$ -	$ 13	$ 1	0%
Trinidad and Tobago	99%	99%	100%	144	$ 274	$ 39	$ 3	0%	$ -	$ 39	$ 3	0%
Latin America and the Caribbean	72%	78%	86%	140,119	$ 157	$ 22,019	$ 1,468	100%	$ 1,583	$ 23,602	$ 1,573	100%

*The goals of these countries have been changed according to what is described in the chapter

Chapter IV
Waste Water Treatment

Notwithstanding the fact that the Millennium Development Goals do not expressly mention a target in terms of waste water treatment such as they do in the case of the supply of drinking water and sanitation services, without a doubt the strategy of any country for the sector[29] refers to achievement of these goals mainly in the categories related to the environmental aspect, that is: revert the loss and degradation of natural resources; improve access to safe water sources and improve conditions for those living in shantytowns. In addition, with regards to the links between poverty and environment it is acknowledged that environmental degradation imposes a larger burden on lower-income sectors and that long-term economic growth is only possible by ensuring its environmental sustainability.

Likewise, the MDG refer to the elimination of waste water, and given that less than half of the region's population is connected to a conventional sewage system and a third depends on "in situ" systems, the treatment problem is serious, as only 14% of the collected volume receives treatment, while in Central America just 4% of effluents are treated.

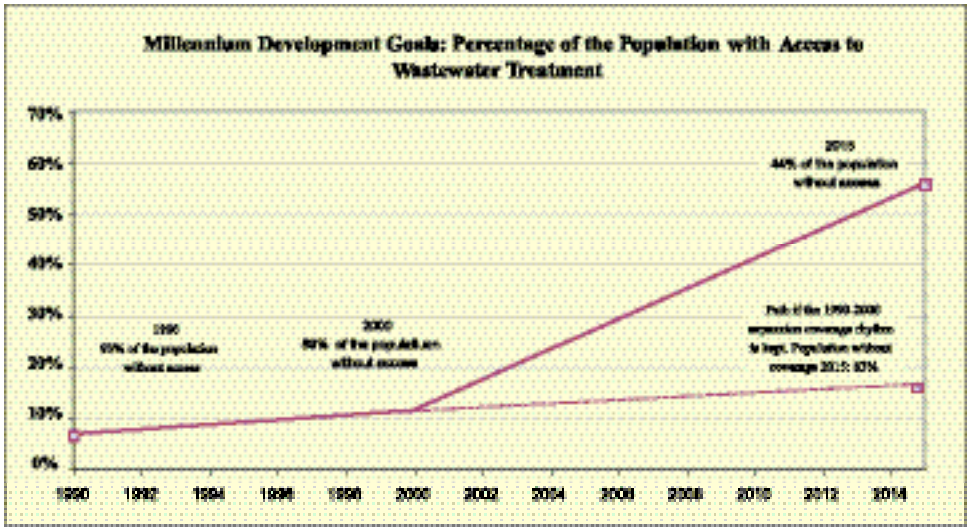
Therefore, as a result of incorporating goals that are relevant for the region, acknowledged in the basic United Nations documents[30] and linked to the goal of achieving by 2020 a considerable improvement in the lives of at least 100 million inhabitants of shantytowns, the reduction to 50% of dwellers who lack access to treatment or final disposal of waste water was added as a supplementary target for 2015.

This goal is determined concurrently with the services addressed in earlier chapters, although in this case the base year used is 2000 due to the availability and quality of data from the countries in the region. Also, the available data covers all the countries in the region, without distinction between rural and urban coverage. Appendix I offers further details on data and sources.

With the purpose of achieving the goal of reducing by 50% the percentage of the population lacking access to sewage systems with waste water treatment, coverage of treatment in the region should be 55% in 2015, derived from the basic regional indicator of 11% recorded in 2000.

This goal is clearly ambitious, as it means increasing five-fold the percentage of people who receive sanitation services that include treatment of effluents. In that respect, during the 1990-2000 period the region showed a poor performance, barely managing an increase in coverage from 7% to 11%.

[29] Inter-American Development Bank, Environment. Strategy document, August 2003.
[30] United Nations, Presentation of reports on the Millennium Development Goals at the country level, October 2001.



The set goal, defined in percentage terms, may be expressed as the additional number of people to be provided with treatment services using population projections for 2015.[31] In the countries under consideration, in order to meet the stated goal, some 289 million people will have to be added to those already receiving effluent treatment, an annual average of slightly over 19 million people for the 2000-2015 period.

ANALYSIS OF REGIONAL INVESTMENT NEEDS

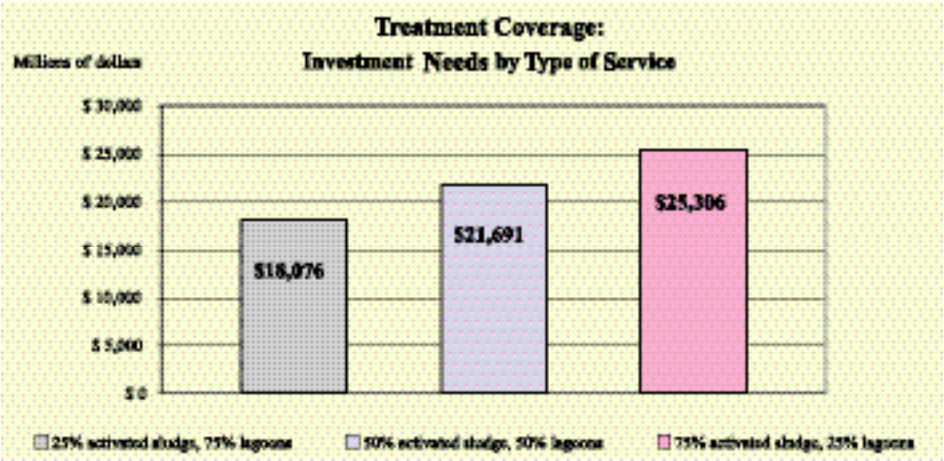
In this item we have sought to determine the capital required in order to effectively add the population that is deemed should be provided with sewage service with effluent treatment by 2015. As the details on Appendix II show, it is assumed that the "average investment costs" per person for installation of effluent treatment vary between US$50 and US$100 according to the technology used.

Average Construction Cost per Person 1990-2000 (US$)
Latin America and the Caribbean

Type of Treatment Plant	Cost per Person (US$)
Activated Sludge	100
Stabilization Lagoons	50

The difference in the assumed costs between activated sludge plants and stabilization lagoons is 100%, so the investment needs will largely depend on the chosen technology, plus the potential addition of building underwater outfalls. According to the assumptions adopted in terms of the plant to be built, the capital needs for funding the required investment as per the established goals range from US$18.1 billion to US$25.3 billion.

[31] Appendix I contains population projections for each country in the region.



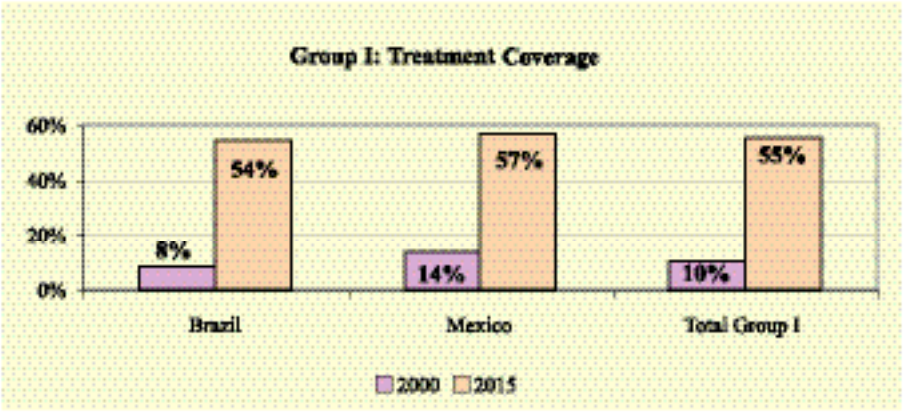
Let it be stressed that within the required investment estimates for drinking water and sanitation addressed in the preceding chapters, the assessment of investment cost for rendering the waste water treatment services hereof does not include the recurring costs from operation and maintenance that will be necessary in order for the treatment infrastructure to be operational through 2015.

INVESTMENT NEEDS BY COUNTRY GROUPS

Below we calculate the capital requirements for each country in order to achieve the figures established to meet the Millennium Development Goals, based on the population projections and extrapolating from the effluent treatment cost the difference in cost from adding a new inhabitant to the sanitation service system for the countries in the region. The procedure used for determining the costs per country is set forth in Appendix II.

Group I (Brazil and Mexico)

This group includes the bulk of the population without access to effluent treatment, as it comprises the most populous countries in the region, whose levels of treatment coverage are similar to the regional average. 52% of the population that needs to receive treatment in order to meet the goal adopted for all Latin America and the Caribbean resides in Brazil and Mexico, that is, 150 million people of a total of 289 million.



Brazil and Mexico start at fairly similar population coverage levels, so, if they meet the goals, by 2015 both countries would enjoy similar coverage levels. At the end of the period Group I should achieve treatment coverage for around 55% of the population.

The coverage and investment required in order to meet the goals established for 2015 for Brazil and Mexico are summarized below.

	Number of People (in thousands)	Average Cost (US$)	Total investment (millions of US$)
Brazil	95,389	$ 75	$ 7,187
Mexico	54,264	$ 50	$ 2,715
Total Group I	149,653	$ 66	**$ 9,902**

Brazil

Despite the fact that Brazil's coverage is not far from the regional average, its demographic predominance makes it the country that concentrates the greatest deficit in effluent treatment in absolute terms within Latin America and the Caribbean. By 2000, 92% of the country's population (156 million people) lacked sanitation with treatment of effluents. For 2015, Brazil's goal is to reduce this percentage so that slightly over half of its population, more precisely 54%, has access to sanitation services with treatment.

Based on the differences in sanitation costs shown by Brazil with regards to the rest of the countries in the region[32], a cost of US$75 per inhabitant was assumed for effluent treatment. The goal for 2015 implies that effluents for an additional 95 million people will have to be treated, resulting in a total of US$7.2 billion in investment. In annual terms, this means that during the 2000-2015 period the country needs to add 6.4 million people and invest US$479 million per year on average.

Mexico

The treatment goal for Mexico is to achieve by 2015 a coverage rate of 57%, starting from the 14% recorded for 2000. In terms of the region Mexico currently exceeds the regional average, but just as in the case of Brazil, the size of its population and its high demographic growth mean that the population that needs to be provided with sanitation that includes treatment by 2015 totals 54 million, so as to reach a coverage level of 57% based on population projections.

The cost assigned to effluent treatment per inhabitant is US$50, lower than Brazil's, reflecting the aforementioned differences in sanitation costs. The resulting investment needs in this case are US$2.72 billion from 2000 to 2015, or US$ 181 million per year.

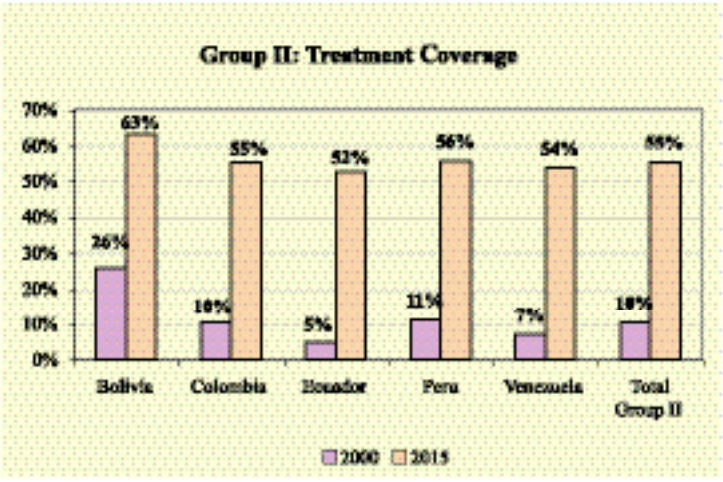
[32] This procedure was repeated for each country. For the calculation of cost per person for Brazil and Mexico and the remaining countries, see Appendix II.

Group II (Bolivia, Colombia, Ecuador, Peru and Venezuela)

Group II, together with Group I, comprise the set of countries with the lowest levels of effluent treatment, although within this group there are wide differences between countries. This group has the second largest number of people who need to be added to the treatment systems by 2015, but the cost per inhabitant is the lowest, which makes the population number a less significant figure with regards to investment needs. Overall, 67 million people must be added to the system in order to reach the group's goal.

Following a procedure similar to that of sanitation services, a single cost of US$37 per inhabitant is assumed for all the group's countries. The required investment is thus US$2.47 billion, US$164.4 million per year through 2015.

In terms of specific countries, 26% of Bolivians have access to effluent treatment services, placing the country first in the group and among the leaders in South America, only surpassed by Uruguay, from Group III. At the other end are Ecuador and Venezuela, with 5% and 7% of treatment coverage, respectively. Colombia (10%) and Peru (11%) show effluent treatment levels similar to the group average.



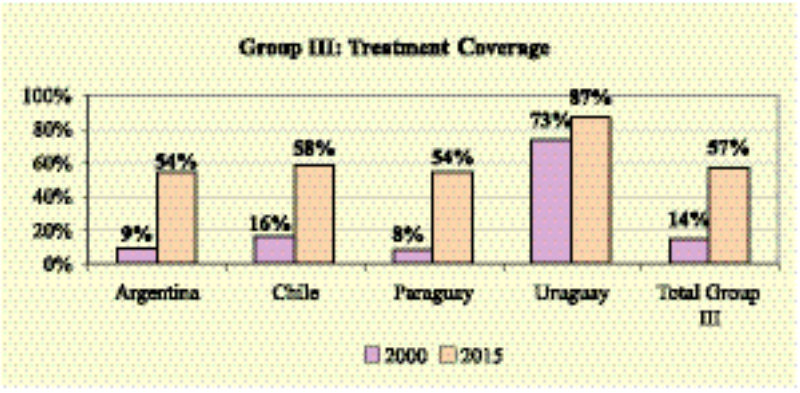
Based on the aforementioned coverage figures, the goals for 2015 range from 52% to 56%, with the exception of Bolivia, where the rate of population with access to treatment should reach 63%. For these countries taken as a whole, the goal is that 55% of the population achieves access to effluent treatment.

The greatest investment amount required corresponds to Colombia, on account of its population size, at US$914 million, representing 37% of the overall investment needs of Group II. As expected based on the aforementioned, Bolivia is the country with the least funding needs for the treatment of effluents. Ecuador, the country lagging further behind, requires US$284 million for its effluent treatment level to reach 52%, thus closing the gap with the other countries.

	Number of People (in thousands)	Average Cost (US$)	Total Investment (millions of US$)
Bolivia	4,908	$ 37	$ 180
Colombia	24,961	$ 37	$ 914
Ecuador	7,753	$ 37	$ 284
Peru	14,885	$ 37	$ 545
Venezuela	14,819	$ 37	$ 543
Total Group II	67,325	$ 37	**$ 2,466**

Group III (Argentina, Chile, Paraguay and Uruguay)

The Southern Cone countries are characterized by the heterogeneous nature of their levels of effluent treatment, so the average coverage of 14% for the whole group does not accurately describe the situation of each one of them. The goal for the group is based on the 57% of the population, or 33 million additional people, who are to be provided with sanitation including treatment by 2015, an annual average of 2.2 million inhabitants.



Based on a cost per capita of US$100, the capital needs for Group III in order to meet the goals in each of the countries amount to US$3.280 billion through 2015, an average of US$ 219 million per year.

Uruguay is the top country in South America and fourth in terms of proportion of its population with access to effluent treatment. Coverage reaches 73% of the population and only needs to increase by 14 percentage points to 87% by 2015. In the remaining countries the goal is to increase coverage to levels between 54% and 58%. Within this group, Paraguay (8%) and Argentina (9%) face the targets from the most disadvantaged starting points.

Argentina stands out significantly within this group, both in terms of population to incorporate to the system, as in investment amounts needed. Its poor performance in the matter and its demographic significance for the group mean that Argentina shall account for 62% of the funds needed by Group III in order to meet the goals. Argentina requires US$2.035 billion while the remaining countries jointly need US$1.245 billion. In addition, of the 33 million new users who are to be provided effluent treatment service, 20 million correspond to Argentina.

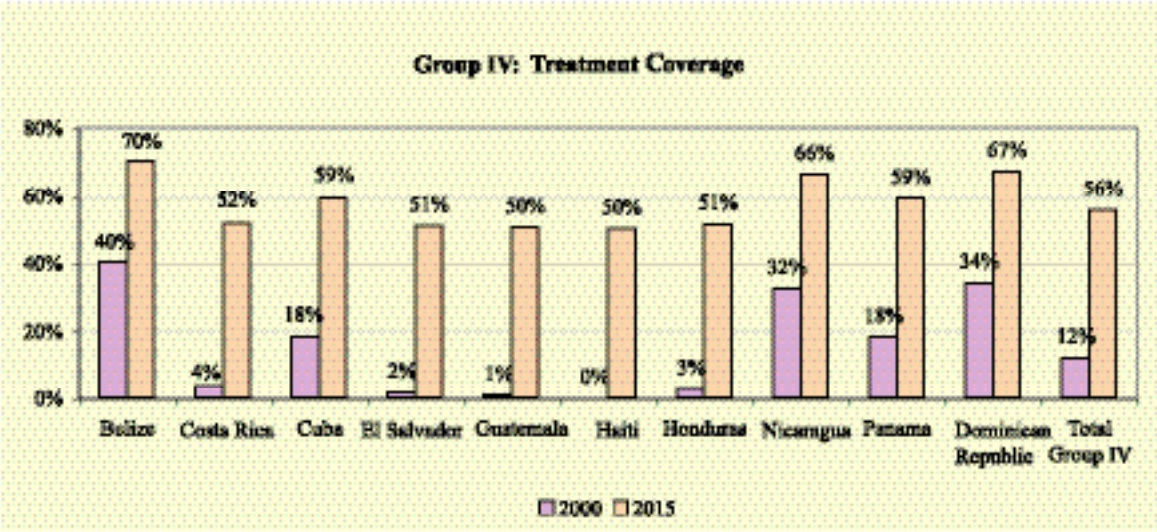
	Number of People (in thousands)	Average Cost (US$)	Total Investment (millions of US$)
Argentina	20,389	$ 100	$ 2,035
Chile	7,953	$ 100	$ 794
Paraguay	3,766	$ 100	$ 376
Uruguay	747	$ 100	$ 75
Total Group III	32,854	$ 100	***$ 3,280***

Group IV (Belize, Costa Rica, Cuba, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama and Dominican Republic)

Effluent treatment coverage for the total population of Group IV is 12%, although it is possible to distinguish the situation of three subgroups of countries. Belize, Panama and Nicaragua lead the group in terms of treatment levels, all of them exceeding 30% coverage.

Cuba and Panama are placed around the middle, with 18% of their population with access to this type of service. However, Haiti, Guatemala, Honduras and Costa Rica practically have no sewage effluent treatment systems and the goal is to provide coverage to at least half of their population.

The group's goal is to reach at the end of the 2000-2015 period a 56% coverage level as weighted average of its populations, with goals that range according to the starting levels, from 50% (Haiti) and 70% (Belize).



Group IV's investment need is estimated at US$1.98 billion between 2000 and 2015 in order to fund the expansion of the treatment systems, estimated at a cost per capita of US$52. This investment amount would enable the provision of effluent treatment service to 38 million people, included with their sanitation services.

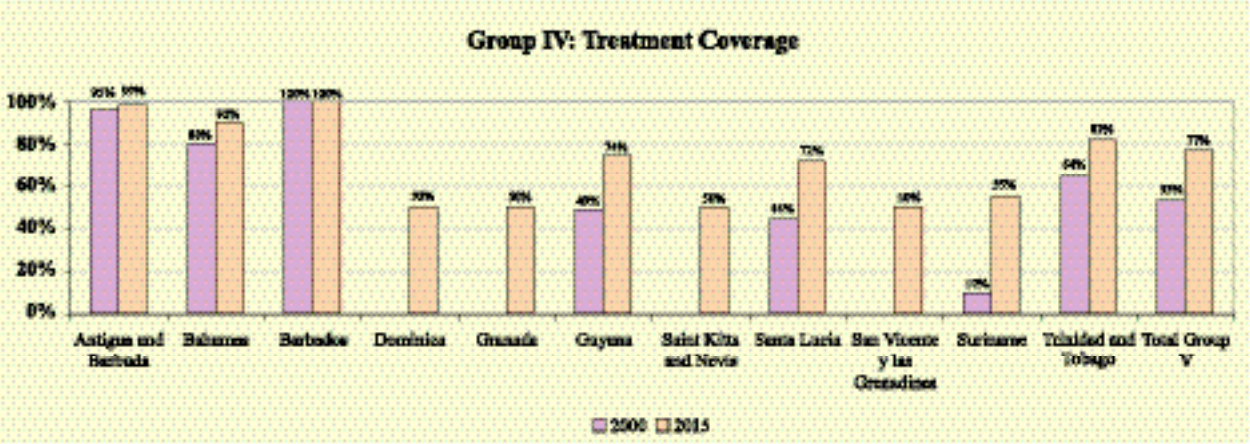
	Number of People (in thousands)	Average Cost (US$)	Total Investment (millions of US$)
Belize	110	$ 52	$ 6
Costa Rica	2,566	$ 52	$ 133
Cuba	4,837	$ 52	$ 250
El Salvador	3,948	$ 52	$ 204
Guatemala	8,166	$ 52	$ 422
Haiti	5,424	$ 52	$ 280
Honduras	4,467	$ 52	$ 231
Nicaragua	3,135	$ 52	$ 162
Panama	1,521	$ 52	$ 79
Dominican Republic	4,135	$ 52	$ 214
Total Group IV	38,309	$ 52	***$ 1,978***

Guatemala, at US$422 million, is the country with the greatest weighting in the group, while Belize only needs US$6 million in order to meet the goal and cover an additional 100,000 people. The differences stem from the current treatment levels, and especially, from their population size, as by 2015, 16 million people are expected to live in Guatemala, against 300,000 in Belize.

Group V (Antigua and Barbuda, Bahamas, Barbados, Dominica, Grenada, Guyana, Jamaica, Saint Christopher-Nevis, Saint Lucia, Saint Vincent and the Grenadines, Surinam and Trinidad and Tobago)

Contrary to the situation with drinking water and sanitation, this indicator is highly heterogeneous, and not all the countries comprising the group show high levels of treatment coverage. In Antigua and Barbuda as well as in Barbados, almost all effluents are treated, but in contrast, Dominica, Grenada, Saint Kitts and Nevis and Saint Vincent and the Grenadines have absolutely no sanitation treatment facilities. Current coverage for the whole Group V is 53%, with the levels of Bahamas (80%) and Trinidad and Tobago (64%) standing out, in addition to the aforementioned countries.

Given current differences, the established coverage goal implies that by 2015 some nations are expected to show total coverage, adding to the services exclusively the population resulting from their demographic growth, while others achieve coverage of half their population.



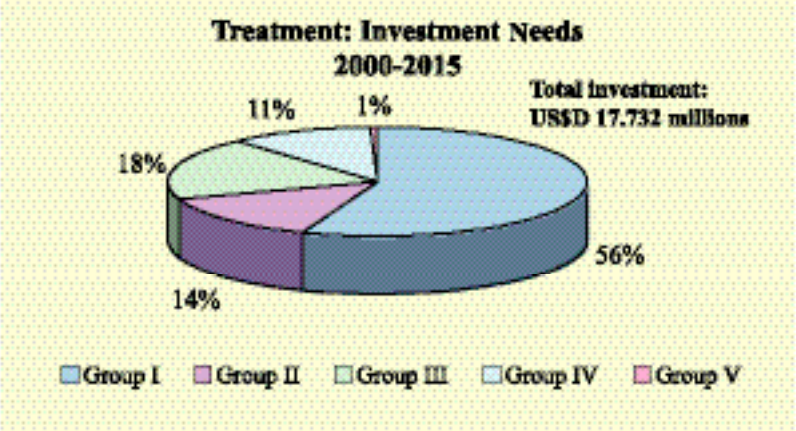
The cost per capita for this group is US$98, similar to that of Group III, mirroring the situation with sanitation services. According to estimates, these countries need to invest US$7 million per year, resulting in a total figure of US$107 million through 2015. This amount means the provision of treatment service to 575,000 new users, thus reducing to half the proportion of the population lacking access to these services.

	Number of People (in thousands)	Average Cost (US$)	Total Investment (millions of US$)
Antigua and Barbuda	16	$ 98	$ 2
Bahamas	80	$ 98	$ 8
Barbados	14	$ 98	$ 1
Dominica	35	$ 98	$ 3
Granada	49	$ 98	$ 5
Guyana	187	$ 98	$ 18
Saint Kitts and Nevis	15	$ 98	$ 1
Santa Lucia	129	$ 98	$ 13
San Vicente and Gr.	53	$ 98	$ 5
Suriname	199	$ 98	$ 20
Trinidad and Tobago	311	$ 98	$ 31
Total Group V	576	$ 98	***$ 107***

CONCLUSIONS

Considering the estimates by country, the resulting total amount of capital needs through 2015 for effluent treatment services in Latin America and the Caribbean is US$17.732 billion, an annual average of US$1.181 billion. The amount is lower than what needs to be assigned to sanitation services in order to meet the Millennium Development Goals, but larger than the amount needed for providing drinking water. This flow of capital would be necessary to add 289 million people to the sewage with waste water treatment service. The treatment goal is thus more ambitious, in terms of population to be added, than the goals for drinking water and sanitation.

The greatest demand for investment is concentrated between Brazil (41%) and Mexico (14%), which jointly need more capital than the rest of the countries in the region, while Argentina is third in terms of funding needs for the region (11%). Groups I and III, which include said countries, require the largest amounts of capital, respectively at 56% and 18% of the total that Latin America and the Caribbean would need to achieve the goals.



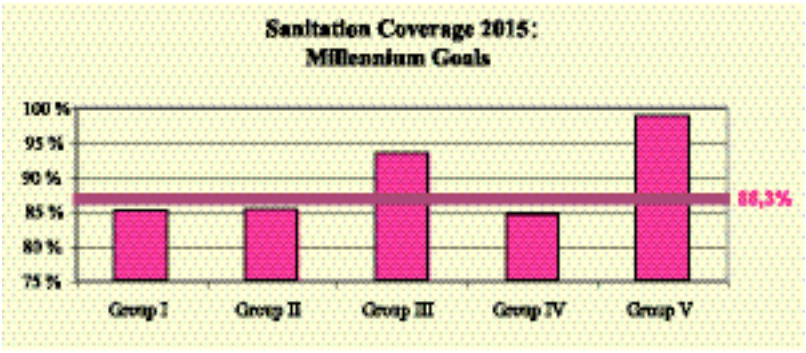
Treatment: Goals and Investment Needs by Country

	Coverage 2000	Goal 2015		Cost per Person	Investment Needs		
		Coverage	Number of People (thousands)		2000-2015 (millions of US$)	Annual (millions of US$)	Regional Participation
Group I	10%	55%	149,653	$ 66	$ 9,902	$ 660	56%
Brazil	8%	54%	95,389	$ 75	$ 7,187	$ 479	41%
Mexico	14%	57%	54,264	$ 50	$ 2,715	$ 181	15%
Group II	10%	55%	67,325	$ 37	$ 2,466	$ 164	14%
Bolivia*	26%	63%	4,908	$ 37	$ 180	$ 12	1%
Colombia	10%	55%	24,961	$ 37	$ 914	$ 61	5%
Ecuador*	5%	52%	7,753	$ 37	$ 284	$ 19	2%
Peru	11%	56%	14,885	$ 37	$ 545	$ 36	3%
Venezuela	7%	54%	14,819	$ 37	$ 543	$ 36	3%
Group III	14%	57%	32,854	$ 100	$ 3,280	$ 219	18%
Argentina	9%	54%	20,389	$ 100	$ 2,035	$ 136	11%
Chile*	16%	58%	7,953	$ 100	$ 794	$ 53	4%
Paraguay	8%	54%	3,766	$ 100	$ 376	$ 25	2%
Uruguay	73%	87%	747	$ 100	$ 75	$ 5	0%
Group IV	12%	56%	38,309	$ 52	$ 1,978	$ 132	11%
Belize*	40%	70%	110	$ 52	$ 6	$ 0	0%
Costa Rica	4%	52%	2,566	$ 52	$ 133	$ 9	1%
Cuba	18%	59%	4,837	$ 52	$ 250	$ 17	1%
El Salvador	2%	51%	3,948	$ 52	$ 204	$ 14	1%
Guatemala*	1%	50%	8,166	$ 52	$ 422	$ 28	2%
Haiti	0%	50%	5,424	$ 52	$ 280	$ 19	2%
Honduras	3%	51%	4,467	$ 52	$ 231	$ 15	1%
Nicaragua	32%	66%	3,135	$ 52	$ 162	$ 11	1%
Panama	18%	59%	1,521	$ 52	$ 79	$ 5	0%
Dominican Republic	34%	67%	4,135	$ 52	$ 214	$ 14	1%
Group V	53%	77%	1,087	$ 98	$ 107	$ 7	1%
Antigua and Barbuda	95%	98%	16	$ 98	$ 2	$ 0	0%
Bahamas	80%	90%	80	$ 98	$ 8	$ 1	0%
Barbados*	100%	100%	14	$ 98	$ 1	$ 0	0%
Dominica*	0%	50%	35	$ 98	$ 3	$ 0	0%
Granada*	0%	50%	49	$ 98	$ 5	$ 0	0%
Guyana*	49%	74%	187	$ 98	$ 18	$ 1	0%
Jamaica	n/d	n/d	n/d	$ 98	n/d	n/d	n/d
San Kitts and Nevis	0%	50%	15	$ 98	$ 1	$ 0	0%
Santa Lucia	44%	72%	129	$ 98	$ 13	$ 1	0%
San Vicent and Grenadines*	0%	50%	53	$ 98	$ 5	$ 0	0%
Suriname	10%	55%	199	$ 98	$ 20	$ 1	0%
Trinidad and Tobago	64%	82%	311	$ 98	$ 31	$ 2	0%
Latin America and the Caribbean	11%	56%	289,228	$ 61	$ 17,732	$ 1,182	100%

Chapter V
Regional Equality Analysis

Even after meeting the Millennium Development Goals, there remain significant inequalities both between countries in the region as within each group of countries. This is because the coverage goals are directly proportional to the coverage in terms of drinking water and sanitation that each country had in 1990, and consequently, the coverage goals set for 2015 greatly reflect the inequalities existing at that time.

The purpose of the "regional equality analysis" is linked to the social goal of eliminating exclusion and seeking to ensure that the measures taken by multilateral or international organizations related to urban infrastructure development in Latin America include the need of facilitating access to improved safe drinking water and sanitation services in countries with the greatest relative deficit.

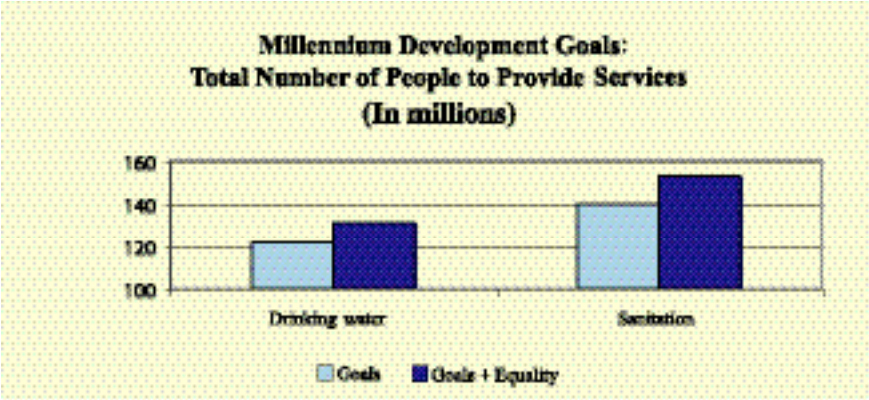


The goal of this section is estimating the amount of the additional investment required in order to ensure that no country remains below the average coverage rate for Latin America and the Caribbean, which is 90% for drinking water and 86.3% for sanitation. The cost per capita used for each country was the average resulting from the estimated investment needed for meeting the Millennium Development Goals. Considering the sub-regional coverage levels for the base year, it is possible to see the relative differences between the different country groups and the minimum values that show the need to include this criteria in the long-term analysis.

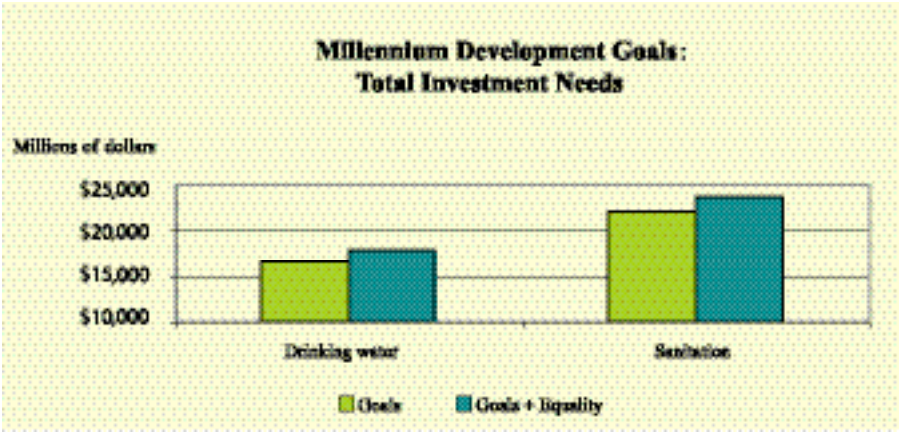
In terms of drinking water the average "access to safe drinking water" in the region comprising Latin America and the Caribbean was 80%, but Groups III and IV only reached levels of 73% and 75% respectively, and at the country level, Haiti with 37%, Argentina with 65% and El Salvador with 67%, represent the lowest rates for a region that in 1990 averaged 80% coverage.

With regards to improved sanitation service coverage, the regional average was 72%. This rate is strongly affected by the rates for Group I (Brazil and Mexico) that, due to their demographic density, weight heavily within the overall indicator. Groups I, II and IV show rates close to the regional average and clearly show a difference with Groups III and V, which, with rates of 87% and 96% respectively, have satisfactory coverage levels for the region. However, at the country level, there are unacceptable levels such as Haiti's 22%, or Peru and Bolivia's 51% and 56% respectively, which are useful, as examples of regional imbalances, but it should be stressed that in both cases their coverage levels in 2000 exceeded 70%.

Likewise, the comparison between the coverage goals of each group and the regional average for 2015 reveals significant differences, both in terms of drinking water as in sanitation. These differences widen if compared to goals at the country level. Thus, for example, the drinking water coverage goal for Haiti stands at 69.5%, while Chile's is 94.5%; Caribbean countries such as Barbados, Dominica, Grenada and Guyana would reach 100%.



The same scenario arises with respect to sanitation goals. While countries such as Haiti, Belize and Bolivia have coverage goals of 60.8%, 73.8% y 75.3% respectively, Chile would reach a sanitation coverage level of 98.5 by 2015. Bahamas, Barbados, and Grenada would achieve 100% coverage.



In order to meet the previously established goals, an additional 9.5 million people would have to be provided with access to drinking water, and another 12.4 million people would have to be given access to sanitation. In terms of demand of funds to be invested, this means an additional US$1.3 billion for the drinking water sector, and US$1.583 billion for sanitation services.

Including this definition of regional equality in the Millennium Development Goals results in additional investments equivalent to 8% for drinking water and 7.2% for sanitation. Although these amounts are not excessively high with respect to the overall demand for funding, the distribution of the additional investment is by definition asymmetric. The countries with lower initial coverage, who tend to be the most economically disadvantaged, are the ones that need to face the greatest additional investments.

The country that would need to carry out the largest additional investment in order to meet the goals added with the equality criteria is Argentina, with an additional US$588 million.[33] These investments correspond exclusively to the provision of drinking water services, as Argentina's projected sanitation coverage exceeds the regional average.

In absolute figures, Haiti is second in terms of additional investment required to meet the criteria of regional equality. However, because it is a small country with low economic development levels, the effort it should undertake to reach the goals is much larger. Achievement of the Millennium Development Goals already requires investment of US$746 million, equivalent to 19% GDP. If the requirement of achieving average regional coverage levels for drinking water and sanitation are added, the total amount of investment more than doubles, to US$1.322 billion, or 33% GDP.

Brazil should also carry out significant additional investments in order to bring the sanitation coverage closer to the regional average, as applying the Millennium Development Goals it would only reach 85.1% coverage. In order to reach 86.3% Brazil would have to invest an additional US$438 million. This is not very significant given the high level of investment required to reach the Millennium goals in drinking water and sanitation. In fact, it amounts to just 3% of the total investment.

Peru should also significantly increase the investment amount in order to reach the regional average coverage, both in drinking water as well as in sanitation. Overall, it should invest an additional US$ 412 million, of which 33% corresponds to drinking water and the remaining 67% to sanitation. This represents a 33% increase in investment.

Other countries that should carry out large additional investments in order to meet the equality criteria are Mexico (US$173.3 million), Bolivia (US$169.4 million), Paraguay (US$127.1 million), Venezuela (US$122.2 million), Honduras (US$65.9 million) and Cuba (US$57.3 million). Guatemala, Dominican Republic, Nicaragua, Ecuador, Belize and Surinam should also carry out additional investments, although in lesser amounts.

[33] Investment figures for drinking water and sanitation arising from the Millennium Development Goals for Argentina are US$3.3 billion.

Chapter VI
Meeting the Established Goals

This chapter addresses the viability of the Millennium Development Goals in light of past performance of Latin American and Caribbean countries and of the financial resources they have available. Likewise, this chapter identifies the countries, regions and services facing the greatest difficulties in coverage expansion and representing the main challenges in meeting the sector's goals.

FEASIBILITY OF MEETING THE GOALS

In order to assess the feasibility of the Millennium Development Goals with regards to access to drinking water and sanitation, this chapter analyzes each country's background in terms of coverage expansion and economic means of the country and its inhabitants.

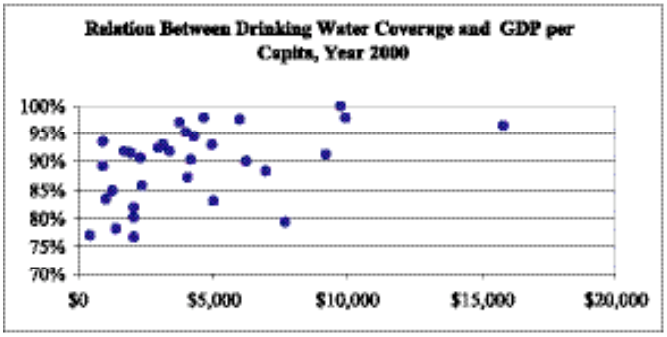
Although the Millennium Declaration dates from 2000 and until that year the countries had not explicitly sought adopting expansion goals for these services equivalent to the Millennium Development Goals, the performance of the countries during the prior decade offers insight on the possibility of meeting the goals. Thus, it is logical to compare the coverage expansion rate actually recorded during 1990-2000 with the requirements imposed by the Millennium Declaration for the following 15 years.

For drinking water services, this analysis shows that at a subregional level and for Latin American and Caribbean countries in general, meeting the Millennium Development Goals is highly feasible. During the 2000-2015 period, most of the countries under study only need to expand their coverage at a similar or even lower annual rate, as that effectively recorded during the 90s.

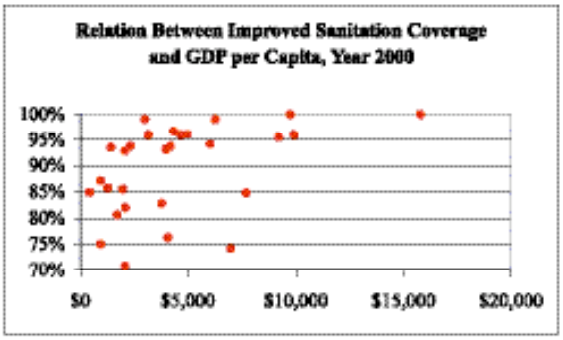
This analysis concludes that the most complicated situation in meeting drinking water goals is that of Central American and Caribbean countries, particularly within Group V, given their poor relative performance in the recent past. However, as detailed below, these countries already show high coverage levels, so the impact of their potential underperformance in population terms is diminished.

Among the countries with larger populations, in order to meet the Millennium Goals it would suffice for Mexico and Argentina to increase their coverage by an annual rate equivalent to 15% of the expansion shown in the 90s. For example, Mexico would need to increase its coverage at an annual average of 0.11 percentage points, while the previous decade its annual increase on average was 0.84 percentage points. On the other hand, in Brazil the required expansion rate for drinking water access would be 40% lower than in the 90s.

In sanitation services the situation is not so auspicious and shows a greater degree of diversity, as seen in Chapter III. For example, Brazil and Argentina have shown a performance that allows some optimism in expecting they may reach the Millennium Goals for sanitation. But on the other hand, Mexico and Colombia require significant increases of their service expansion rates, which should go from 0.33 to 0.75 and from 0.23 to 0.40 annual percentage points respectively.



Excluding Haiti
Source: World Bank and UNICEF/OMS



Performances in the sanitation area during the 90s within each country group are also diverse. Such is the case of Group II, showing extreme differences, where Ecuador increased its coverage by 15 percentage points per year between 1990 and 2000, with just 4 points left to meet the 2015 target, while Venezuela has only increased its coverage rate by one percentage point per year, against the 17 points it needs to meet the goal. It should be pointed out that Ecuador is one of the countries with the best performance over the past decade.

Another approach for studying the feasibility of meeting the Millennium Development Goals is to compare the emerging capital needs with respect to the economic resources of the countries and their inhabitants. To that end, the GDP and GDP per capita data for 2001, stated in U.S. dollars and at current prices is compared with the annual investment needs and with the cost per capita, respectively.

These comparisons show that certain countries, beyond their recent developments in terms of drinking water and sanitation services, are subject to severe economic restrictions, at least in terms of their own resources, which would severely hinder their chances of meeting the goals. For example, Nicaragua needs to invest an amount equivalent to 24% of its current GDP, the highest ratio in the region, which raises doubts about the feasibility of achieving these targets, despite the fact that its performance during the last few years, both in drinking water as well as in sanitation, is among the best in the region.

Probability Indicators for Compliance with the Investment Needs

	GDP millions	Country Total Investment	Investment in the Sector	Investment Needs 2000-2015 Water, Sanitation and Treatment				
				Total Investment	Annual Investment	Total Investment/GDP	Annual Investment/GDP	Annual Investment / Sector Investment
	millions of US$							
Group I								
Brazil	$ 601,700	$ 124,612	$ 1,156	$ 21,415	$ 1,428	4%	0.2%	124%
Mexico	$ 580,800	$ 119,180	$ 268	$ 9,537	$ 636	2%	0.1%	237%
Group II								
Bolivia*	$ 8,400	$ 1,089	$ 51	$ 681	$ 45	8%	0.5%	88%
Colombia	$ 83,200	$ 12,438	$ 466	$ 3,399	$ 227	4%	0.3%	49%
Ecuador*	$ 15,900	$ 4,080	$ 128	$ 949	$ 63	6%	0.4%	49%
Peru	$ 53,500	$ 9,817	n/d	$ 1,788	$ 119	3%	0.2%	n/d
Venezuela	$ 121,300		$ 210	$ 2,163	$ 144	2%	0.1%	69%
Group III								
Argentina	$ 284,300	$ 40,115	$ 300	$ 5,346	$ 356	2%	0.1%	119%
Chile*	$ 75,500	$ 15,621	$ 168	$ 2,151	$ 143	3%	0.2%	85%
Paraguay	$ 7,700	$ 1,924	n/d	$ 1,307	$ 87	17%	1.1%	n/d
Uruguay	$ 20,100	$ 2,718	$ 82	$ 265	$ 18	1%	0.1%	22%
Group IV								
Belize*	$ 773	$ 267	$ 3	$ 23	$ 2	3%	0.2%	53%
Costa Rica	$ 16,000	$ 2,874	$ 162	$ 431	$ 29	3%	0.2%	18%
Cuba	$ 25,900		n/d	$ 454	$ 30	2%	0.1%	n/d
El Salvador	$ 13,100	$ 2,092	$ 22	$ 611	$ 41	5%	0.3%	181%
Guatemala*	$ 19,300	$ 2,936	$ 73	$ 1,460	$ 97	8%	0.5%	133%
Haiti	$ 4,000	$ 1,228	$ 74	$ 1,027	$ 68	26%	1.7%	93%
Honduras	$ 6,000	$ 1,831	$ 269	$ 868	$ 58	14%	1.0%	22%
Nicaragua	$ 2,100		$ 33	$ 663	$ 44	32%	2.1%	136%
Panama	$ 11,900	$ 3,332	$ 13	$ 239	$ 16	2%	0.1%	121%
Dominican Republic	$ 19,600	$ 4,579	$ 97	$ 871	$ 58	4%	0.3%	60%
Group V								
Antigua and Barbuda	$ 660	$ 180	$ 6	$ 9	$ 1	1%	0.1%	10%
Bahamas	$ 4,800		$ 94	$ 35	$ 2	1%	0.0%	2%
Barbados*	$ 2,600	$ 508	$ 82	$ 15	$ 1	1%	0.0%	1%
Dominica*	$ 267	$ 75	$ 12	$ 5	$ 0	2%	0.1%	3%
Granada*	$ 407	$ 130	$ 2	$ 9	$ 1	2%	0.2%	32%
Guyana*	$ 713	$ 156	n/d	$ 50	$ 3	7%	0.5%	n/d
Jamaica	$ 7,700		$ 15	$ 212	$ 14	3%	0.2%	97%
San Kitts and Nevis	$ 328	$ 151	$ 4	$ 2	$ 0	1%	0.0%	3%
Santa Lucia	$ 687	$ 144	n/d	$ 64	$ 4	9%	0.6%	n/d
San Vicent and Grenadines*	$ 336	$ 92	$ 5	$ 10	$ 1	3%	0.2%	13%
Suriname	$ 865	$ 138	$ 507	$ 41	$ 3	5%	0.3%	1%
Trinidad and Tobago	$ 8,100	$ 1,495	$ 35	$ 102	$ 7	1%	0.1%	19%

*Does not include investment needs for wastewater treatment
Source: World Bank and UNICEF/WHO, CEPIS

In the case of Haiti, total investments in the sector represent 19% of GDP, which strengthens the presumption, based on its past performance, that Haiti has scant chances of meeting the Millennium Goals. A similar analysis can be performed for Guyana, comparing per capita service costs with GDP per capita. Providing access to drinking water to an additional person in Guyana costs the equivalent of 21% of GDP per capita, and 29% for providing access to sanitation, which makes Guyana the country that requires the greatest effort in Latin America and the Caribbean, after Nicaragua.

On the other hand, although Mexico and Colombia did not sufficiently increase their sanitation coverage between 1990 and 2000, their economic capability, measured in relation to required investments or to cost per capita for the expansion, offers a degree of optimism with regards to its potential for achieving the 50% reduction of the percentage of the population lacking access to sanitation services.

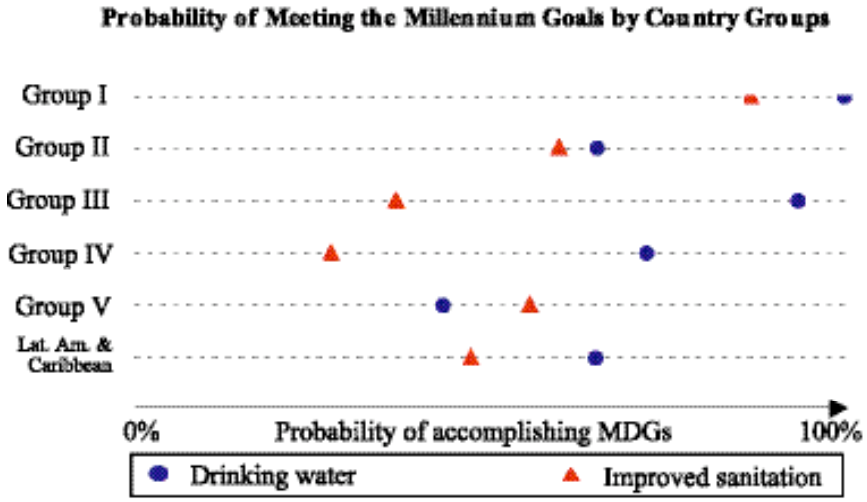
A table is included at the end of this chapter based on the results of the preceding analysis, identifying the feasibility of meeting the Millennium Goals in terms of access to drinking water and sanitation services for each country.

SECTORAL CHALLENGES

Achieving the demands imposed by subscribing the Millennium Declaration poses a general challenge that concerns all the institutions related to the sector, giving rise to specific challenges mainly related to current inequalities in coverage levels.

The comparison between the chances of meeting the goals in safe drinking water and in improved sanitation clearly favors the former service. From the 28 nations under consideration, it is estimated that 85% would probably meet the goals or show conditions that would enable them to reduce by 50% the percentage of people lacking access to safe drinking water. On the other hand, the perspectives for improved sanitation are not so positive. In eight countries sufficient coverage expansion is estimated as improbable, while only 12 countries are deemed to show high probability of achieving the aforementioned expansion.

With regards to drinking water, the countries in Group V represent the main challenge facing the sector in Latin America and the Caribbean, although concerns are mitigated in light of the existing coverage percentages of the countries in the group. The feasibility assessment estimates show that it is unlikely that Guyana, Jamaica and Trinidad and Tobago meet the goals, while in the remaining groups there are only two countries with such slim chances of meeting them.



In terms of access to sanitation, Group IV is at the greatest disadvantage. For half the countries in this group (4 out of 8) meeting the Millennium Goals for this service would be unfeasible. Beyond Group IV, it is also unlikely that Guyana meet either goal by 2015.

In light of the risk of increasing regional inequalities in access to services, special attention should be paid to those countries lacking significant chances of meeting the Millennium Goals and who also show low and medium coverage levels. Nicaragua and Suriname are in this situation in terms of drinking water, while Belize, Dominican Republic and Venezuela qualify with regards to improved sanitation. Mexico's situation is not so complicated although it represents a special challenge due to its demographic significance in the region. Haiti is clearly the country with the greatest problems in terms of initial coverage and potential for reaching the goals, constituting the most disadvantaged country in both services.

Also, it would be convenient to ensure that countries with low initial coverage that have the potential or are likely to meet the goals, manage to effectively reach the expected reduction in uncovered population. El Salvador and Peru are examples of this type of countries in terms of both services.

Safe Drinking Water
Chance of Achieving the Goals and Coverage Level

		Feasibility of Achieving the Goals		
		Probable	*Potential*	*Unlikely*
Coverage Level	High	Bahamas Barbados Chile Dominica	Costa Rica Grenada St Kitts and Nevis St Vincent and Grenadines St Lucia Uruguay	Guyana
	Medium	Belize Brazil Guatemala Honduras Mexico	Antigua and Barbuda Cuba Panama	Jamaica Colombia Trinidad and Tobago
	Low	Argentina Bolivia Ecuador El Salvador Paraguay Peru Dominican Rep. Venezuela	Nicaragua Surinam	Haiti

In certain countries, the unlikelihood of achieving the goals undertaken with the Millennium Declaration is associated to high initial coverage levels. For example, the chances for Grenada in terms of improved sanitation are slim due to the reasons mentioned in the prior section, but their existing coverage is almost total (97%). Also, it is unlikely that Guyana raises its drinking coverage level much beyond its current 94%.

Improved Sanitation
Chance of Achieving the Goals and Coverage Level

		Feasibility of Meeting the Goals		
		Probable	*Potential*	*Unlikely*
Coverage Level	High	Bahamas Barbados St Lucia	Antigua and Barbuda Chile Jamaica St Kitts and Nevis St Vincent and Grenadine Trinidad and Tobago Uruguay	Grenada
	Medium	Cuba Ecuador Panama	Argentina Colombia Nicaragua Surinam	Costa Rica Guyana Paraguay
	Low	Bolivia Brazil El Salvador Guatemala Honduras Peru	Mexico	Belize Haiti Dominican Rep. Venezuela

The main challenges facing the region in the drinking water and sanitation sectors can be summarized as follows:

• The achievement of sanitation goals is the main challenge facing Latin America and the Caribbean, beyond drinking water, whose services are more likely to expand in order to reduce the population lacking coverage.

• The greatest efforts should be aimed geographically in order to support the achievement of the Millennium Goals in the countries with the lowest coverage and chances of achieving them, while preventing the inequalities between the countries of the region from increasing by 2015.

• In terms of drinking water the greatest challenges fall on Group V, while in sanitation the greatest challenges are mainly faced by Group IV. It would also be necessary to support the countries in Group III so they may materialize their chances to achieve the improved sanitation goals.

• Haiti's situation is the most challenging in the region, taking into account both current coverage and the feasibility of the Millennium Development Goals. In terms of drinking water Nicaragua and Suriname bear mentioning, while in improved sanitation other countries in a challenging situation are Belize, Dominican Republic and Venezuela.

SECTORAL FUNDING

The role of external funding in the sector is decisive for the countries' performance in expanding access to safe drinking water and improved sanitation. Comparing the amount of foreign capital in the sector we may conclude that in Latin America and the Caribbean the countries with lowest per capita GDP benefited more than the rest in relative terms. In general said external funding was determined by the scarcity of the countries' own funds.

According to data supplied by PAHO in the Regional Report regarding the Assessment 2000, investment in the drinking water and sanitation sector carried out with external resources represent 23% for Latin America and the Caribbean, and the rest corresponds to domestic funding.[34]

Some regions and countries have particularly benefited from foreign credit, especially the nations in Groups IV and V, where on average foreign funding represents 43% and 45% respectively. In Group III, Argentina and Uruguay show a high dependency on foreign capital flows, while Chile exclusively uses its own funds, as is the case with Mexico, from Group I.

Despite the criteria followed by international funding, in the countries that benefited the most from it in relative terms it was not possible to adequately expand coverage, as is the case with Haiti and Nicaragua, where participation of external capital amounts to 94% and 84%, and to a lesser degree, in Costa Rica and El Salvador. Given these countries' performance, the high percentage of foreign funding is in greater measure a consequence of their meager capability for channeling local funds towards the sector. This situation shows these countries' high dependency on foreign funding, where even with high relative ratios of foreign credit their service expansion remains below the regional average.

Some exceptions should be noted, as Bolivia, whose domestically funded investments represent only 39% of the total. Bolivia managed to achieve significant increases in safe drinking water and improved sanitation coverage, evidencing its ability to profitably employ external funding.

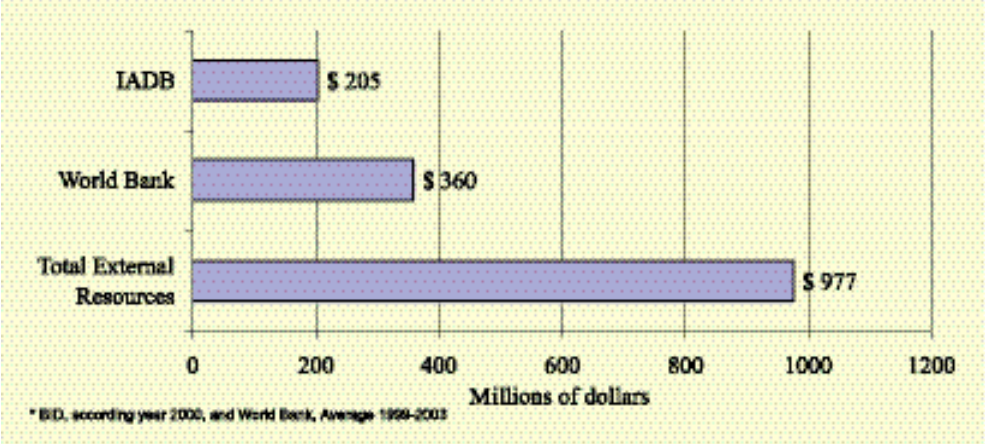
On the other hand, countries with larger economies, including Mexico, Chile and Brazil, depend to a lesser extent on external sources and have based their service expansions on their own resources. Among the largest countries in terms of economy and population, Argentina is the country that has resorted to foreign funding to a greatest extent.

In absolute terms, Mexico is by far the main destination for foreign funds in the drinking water and sanitation sector, followed by Argentina, Colombia, Venezuela, Costa Rica and Haiti. Barbados stands out in terms of its dependency on foreign funds, receiving 6% of the overall resources, representing 76% of the country's total investment in the sector.

In this analysis Haiti stands out once again among the countries in its group and within Latin America and the Caribbean on account of its heavy dependence on foreign funds. Despite the difference between its economy and the remaining countries in the region, Haiti receives approximately 6% of all external resources for Latin America and the Caribbean assigned to the drinking water and sanitation sector. Only a quarter of the investment in the sector was financed by own funds.

[34] The data for each country is shown at the end of the chapter.

Foreign Funds for the Drinking Water and Sanitation Sector



The World Bank and the Inter-American Development Bank are the most important international credit organizations for the sector at the regional level, accounting for approximately 58% of foreign funding for the sector and 13% of overall financing, which shows the vital role played by these organizations. There are other multilateral credit institutions granting loans to the sector, such as the Fondo Financiero para el Desarrollo de la Cuenca del Plata (FONPLATA) or the Corporación Andina de Fomento (CAF), working with the Southern Cone countries and the Andean region respectively, which due to their nature, restrict their financing to certain geographic areas or economic blocks within Latin America or the Caribbean.

	Drinking Water			Sanitation		
	Probable	Potential	Unlikely	Probable	Potential	Unlikely
Group I						
Brazil	•			•		
Mexico	•				•	
Group II						
Bolivia	•			•		
Colombia			•		•	
Ecuador	•			•		
Peru	•			•		
Venezuela	•					•
Group III						
Argentina	•				•	
Chile	•				•	
Paraguay	•					•
Uruguay		•			•	
Group IV						
Belize	•					•
Costa Rica		•				•
Cuba		•		•		
El Salvador	•			•		
Guatemala	•			•		
Haiti			•			•
Honduras	•			•		
Nicaragua		•			•	
Panama		•		•		
Dominican Republic	•					•
Group V						
Antigua and Barbuda		•			•	
Bahamas	•			•		
Barbados	•			•		
Dominica	•				•	
Granada		•				•
Guyana			•			•
Jamaica			•		•	
San Kitts and Nevis		•			•	
Santa Lucia		•		•		
San Vicente and the Grenadines		•			•	
Suriname		•			•	
Trinidad and Tobago			•		•	
Latin America and the Caribbean						

	Annual Sector Investment	Public Resources	External Resources	Public Resources	External Resources	Percentage
	Millions of US$			Proportion		
Group I	**$ 1,424**	**$ 1,221**	**$ 204**	**91%**	**9%**	**21%**
Brazil	$ 1,156	$ 952	$ 204	82%	18%	21%
Mexico	$ 268	$ 268	$ -	100%	0%	0%
Group II	**$ 855**	**$ 625**	**$ 231**	**64%**	**36%**	**24%**
Bolivia	$ 51	$ 20	$ 32	39%	61%	3%
Colombia	$ 466	$ 380	$ 86	82%	18%	9%
Ecuador	$ 128	$ 90	$ 38	70%	30%	4%
Peru	n/a	n/a	n/a	n/a	n/a	n/a
Venezuela	$ 210	$ 135	$ 75	64%	36%	7.69%
Group III	**$ 550**	**$ 411**	**$ 139**	**73%**	**27%**	**14%**
Argentina	$ 300	$ 200	$ 100	67%	33%	10%
Chile	$ 168	$ 168	$ -	100%	0%	0%
Paraguay	n/a	n/a	n/a	n/a	n/a	n/a
Uruguay	$ 82	$ 43	$ 39	53%	47%	4%
Group IV	**$ 746**	**$ 505**	**$ 241**	**57%**	**43%**	**25%**
Belize	$ 3	$ 2	$ 1	60%	40%	0%
Costa Rica	$ 162	$ 87	$ 75	54%	46%	7.67%
Cuba	n/a	n/a	n/a	n/a	n/a	n/a
El Salvador	$ 22	$ 7	$ 16	30%	70%	2%
Guatemala	$ 73	$ 60	$ 13	82%	18%	1%
Haiti	$ 74	$ 4	$ 69	6%	94%	7%
Honduras	$ 269	$ 239	$ 30	89%	11%	3%
Nicaragua	$ 33	$ 5	$ 27	16%	84%	3%
Panama	$ 13	$ 10	$ 3	79%	21%	0%
Dominican Republic	$ 97	$ 90	$ 7	93%	7%	1%
Group V	**$ 761**	**$ 598**	**$ 163**	**55%**	**45%**	**17%**
Antigua and Barbuda	$ 6	$ 6	$ -	100%	0%	0%
Bahamas	$ 94	$ 50	$ 44	53%	47%	5%
Barbados	$ 82	$ 20	$ 62	24%	76%	6%
Dominica	$ 12	$ 7	$ 5	60%	40%	1%
Granada	$ 2	$ 1	$ 1	28%	72%	0%
Guyana	n/a	n/a	n/a	n/a	n/a	n/a
Jamaica	$ 15	$ 3	$ 12	21%	79%	1%
San Kitts and Nevis	$ 4	$ 4	$ -	100%	0%	0%
Santa Lucia	n/a	n/a	n/a	n/a	n/a	n/a
San Vicente an the Grenadines	$ 5	$ 3	$ 2	54%	46%	0%
Suriname	$ 507	$ 500	$ 7	99%	1%	1%
Trinidad and Tobago	$ 35	$ 5	$ 30	14%	86%	3%
Latin America and the Caribbean	**$ 4,336**	**$ 3,359**	**$ 977**	**61%**	**39%**	**100%**

Source: PAHO-WHO, Assessment 2000. No data is provided for Peru, Paraguay, Cuba, Guyana and Santa Lucia.

Probability Indicators for Compliance with the MDGs

	Investment Needs 2000-2015 / GDP			Cost per Person / GDP per Capita			Drinking Water Coverage			Sanitation Coverage		
							1990-2000	Goal 2015		1990-2000	Goal 2015	
	Drinking Water	Sanitation	Total	Drinking Water	Sanitation	Total	Annual Increase	Annual Increase	Ratio	Annual Increase	Annual Increase	Ratio
Group I							A	B	B / A	C	D	D / C
Brazil	0.9%	1.5%	2.4%	4%	4%	8%	0.47%	0.27%	0.6	0.62%	0.58%	0.9
Mexico	0.6%	0.6%	1.2%	2%	3%	5%	0.84%	0.11%	0.1	0.33%	0.75%	2.3
Group II												
Bolivia	2.9%	3.1%	6.0%	9%	10%	19%	1.33%	0.16%	0.1	1.88%	0.39%	0.2
Colombia	1.4%	1.5%	3.0%	5%	5%	10%	-0.22%	0.36%	-1.6	0.23%	0.40%	1.7
Ecuador	1.9%	2.3%	4.2%	7%	8%	16%	1.35%	0.27%	0.2	1.51%	0.29%	0.2
Peru	1.1%	1.2%	2.3%	4%	5%	9%	0.96%	0.34%	0.4	1.51%	0.47%	0.3
Venezuela	0.5%	0.8%	1.3%	2%	2%	4%	0.57%	0.38%	0.7	0.08%	1.04%	13.3
Group III												
Argentina	0.4%	0.7%	1.2%	2%	3%	6%	1.42%	0.21%	0.2	0.34%	0.39%	1.2
Chile	0.7%	1.1%	1.8%	4%	5%	9%	0.38%	0.11%	0.3	-0.08%	0.16%	-1.9
Paraguay	4.8%	7.3%	12.1%	13%	20%	33%	1.63%	0.20%	0.1	0.02%	0.21%	8.3
Uruguay	0.4%	0.6%	0.9%	3%	4%	7%	0.02%	0.10%	6.3	0.03%	0.19%	5.9
Group IV												
Belize	1.0%	1.3%	2.3%	3%	3%	7%	1.88%	0.12%	0.1	0.22%	1.59%	7.1
Costa Rica	0.9%	1.0%	1.9%	3%	3%	6%	0.04%	0.14%	3.8	-0.04%	0.24%	-5.6
Cuba	0.4%	0.4%	0.8%	5%	5%	10%	0.10%	0.28%	2.7	2.89%	0.15%	0.1
El Salvador	1.5%	1.6%	3.1%	6%	7%	13%	0.93%	0.47%	0.5	0.80%	0.33%	0.4
Guatemala	2.6%	2.8%	5.4%	6%	7%	13%	1.73%	0.04%	0.0	1.26%	0.23%	0.2
Haiti	9.8%	8.8%	18.7%	22%	24%	47%	0.73%	1.54%	2.1	1.26%	1.77%	1.4
Honduras	5.0%	5.6%	10.6%	12%	10%	22%	0.68%	0.13%	0.2	1.48%	0.34%	0.2
Nicaragua	11.8%	12.1%	23.9%	30%	34%	64%	0.72%	0.53%	0.7	0.88%	0.21%	0.2
Panama	0.7%	0.7%	1.3%	3%	3%	6%	0.05%	0.31%	6.0	0.22%	0.14%	0.6
Dominican Republic	1.5%	1.9%	3.4%	5%	5%	10%	0.36%	0.35%	1.0	0.12%	1.08%	9.4
Group V												
Antigua and Barbuda	0.5%	0.6%	1.1%	2%	3%	5%	-0.18%	0.35%	-2.0	-0.12%	0.19%	-1.6
Bahamas	0.2%	0.3%	0.6%	1%	1%	3%	0.06%	0.09%	1.4	0.00%	0.00%	-
Barbados	0.2%	0.3%	0.5%	2%	3%	5%	0.00%	0.00%	-	0.00%	0.00%	-
Dominica	0.2%	0.4%	0.6%	5%	7%	12%	0.45%	0.19%	0.4	0.49%	0.41%	0.8
Granada	0.5%	0.7%	1.1%	4%	6%	11%	0.13%	0.37%	2.8	-0.03%	0.23%	-6.9
Guyana	1.8%	2.6%	4.4%	21%	29%	50%	0.06%	0.42%	6.6	0.14%	0.69%	4.8
Jamaica	1.2%	1.6%	2.8%	6%	9%	16%	0.00%	0.26%	-	0.00%	0.03%	-
San Kitts and Nevis	0.1%	0.1%	0.1%	2%	3%	5%	-0.20%	0.13%	-0.7	-0.33%	0.16%	-0.5
Santa Lucia	3.8%	3.6%	7.4%	4%	6%	10%	0.00%	0.07%	-	0.20%	0.07%	0.3
San Vicente and the Grenadines	0.2%	1.1%	1.3%	7%	7%	13%	0.00%	0.25%	-	0.00%	0.13%	-
Suriname	1.1%	1.5%	2.5%	9%	13%	22%	0.39%	0.47%	1.2	0.22%	0.17%	0.8
Trinidad and Tobago	0.4%	0.5%	0.9%	3%	4%	7%	-0.10%	0.37%	-3.7	0.00%	0.03%	-

Source: GDP According to World Bank, 2000, and CIA factbook for Cuba

Appendix I
Access to Safe Drinking Water and Improved Sanitation

BASIC DATA

The coverage data used is derived from a series of coverage reports drawn by UNICEF and by the World Health Organization available on ***http://www.childinfo.org/eddb/sani/latam/ latam.htm***. This data is an updated version of the data from the Global Water Supply and Sanitation Assessment 2000. The advantage of this database over that contained in Assessment 2000 is that it takes into account other assessments, surveys and census such as the Demographic Health Survey (DHS) performed by Macro International, the Multiple Indicator Cluster Survey (MICS) performed by UNICEF, the Living Standard Measurement Survey (LSMS) of the World Bank, and countries' census surveys.

This data provides a series of coverage percentages for different moments in time between 1980 and 2000. Given that certain assessments were not performed in all countries, and that each country has different coverage data based on census or other surveys, the amount of information and its dates vary from country to country.

For the countries showing a relatively large amount of coverage data for different moments in time, UNICEF/WHO estimate the coverage by means of a lineal regression of ordinary square minimums. If data differs significantly from the definition of access to an improved source of water and sanitation or that was obtained through a methodology deemed untrustworthy, this data is not used in the regression. Estimates by means of lineal regression were done for Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Paraguay and Peru.

In countries with insufficient available data for a regression, estimates from UNICEF/WHO's same document were used. In almost all these estimates the oldest available data dates from 1995[35]. For the following countries a square minimum estimate was not performed: Antigua and Barbuda, Argentina[36], Bahamas, Barbados, Belize, Costa Rica, Cuba, Dominica, Grenada, Guyana, Panama[37], Saint Christopher and Nevis[38], Suriname, Trinidad and Tobago, Uruguay and Venezuela.[39]

There is no estimate for Saint Christopher and Nevis and for the Grenadines. For said countries, data from Assessment 2000 was used, assuming that coverage did not change between 1990 and 2000.

For more information on the methodology used by UNICEF/WHO in calculating the estimates see ***http://www.childinfo.org/eddb/sani/metho.htm***

[35] Except Argentina (estimates for 1990 and 1995) and Trinidad and Tobago (1987, 1990, 2000).
[36] For 1990 the data employed comes from The International Drinking Water Supply and Sanitation Decade. Review of Mid-Decade Progress (1990) for drinking water coverage and the 1991 National Census for sanitation coverage. The 2000 coverage data used are provided by the Assessment 2000 regional report.
[37] Coverage data for sanitation for 2000 was directly taken from the Assessment 2000 regional report.
[38] The 1990 coverage data employed is taken from the 1991 Water Supply and Sanitation Monitoring Report.
[39] Coverage data for 1990 was taken from the 1994 Water Supply and Sanitation Sector Monitoring Report.

Access to Safe Drinking Water

COUNTRY	1990			2000		
	Urban Coverage	Rural Coverage	Total	Urban Coverage	Rural Coverage	Total
Antigua and Barbuda	95%	89%	93%	95%	89%	91%
Argentina	73%	17%	65%	85%	30%	79%
Bahamas	98%	86%	96%	98%	86%	97%
Barbados	100%	100%	100%	100%	100%	100%
Belize	95%	53%	73%	100%	82%	92%
Bolivia	91%	47%	70%	95%	64%	83%
Brazil	93%	54%	82%	95%	53%	87%
Chile	98%	49%	89%	99%	58%	93%
Colombia	98%	84%	94%	99%	70%	91%
Costa Rica	99%	92%	95%	99%	92%	95%
Cuba	95%	77%	90%	95%	77%	91%
Dominica	100%	90%	93%	100%	90%	97%
Dominican Republic	92%	71%	82%	90%	78%	86%
Ecuador	82%	58%	71%	90%	75%	85%
El Salvador	88%	48%	67%	91%	64%	77%
Grenada	97%	93%	93%	97%	93%	95%
Guatemala	88%	69%	75%	98%	88%	92%
Guyana	98%	91%	93%	98%	91%	94%
Haiti	56%	35%	39%	49%	45%	46%
Honduras	89%	78%	83%	95%	83%	89%
Jamaica	98%	87%	92%	98%	85%	92%
Mexico	90%	52%	80%	95%	69%	88%
Nicaragua	93%	44%	70%	91%	59%	77%
Panama	99%	79%	90%	99%	79%	90%
Paraguay	80%	46%	62%	93%	59%	78%
Peru	88%	42%	71%	87%	62%	80%
Saint Kitts and Nevis	100%	100%	100%	98%	98%	98%
Saint Lucia	98%	98%	98%	98%	98%	98%
Saint Vincent and the Grenadines	93%	93%	93%	93%	93%	93%
Suriname	93%	50%	78%	93%	50%	82%
Trinidad and Tobago	91%	91%	91%	90%	90%	90%
Uruguay	98%	93%	97%	98%	93%	98%
Venezuela	80%	64%	77%	85%	70%	83%
Weighted Average	**89.8%**	**56.6%**	**79.7%**	**93.2%**	**64.6%**	**86.1%**

Source: WHO/UNICEF 2003, Projections per country (Access to Improved Sanitation and Drinking Water Sources)

Access to Improved Sanitation

COUNTRY	1990			2000		
	Urban Coverage	Rural Coverage	Total	Urban Coverage	Rural Coverage	Total
Antigua and Barbuda	98%	94%	97%	98%	94%	95%
Argentina	87%	47%	81%	89%	48%	85%
Bahamas	100%	100%	100%	100%	100%	100%
Barbados	100%	100%	100%	100%	100%	100%
Belize	76%	22%	48%	71%	25%	50%
Bolivia	73%	26%	51%	86%	42%	70%
Brazil	82%	38%	70%	84%	43%	76%
Chile	98%	92%	97%	96%	97%	96%
Colombia	96%	55%	83%	96%	56%	86%
Costa Rica	89%	97%	94%	89%	97%	93%
Cuba	71%	51%	65%	97%	84%	94%
Dominica	86%	75%	78%	86%	75%	83%
Dominican Republic	70%	60%	65%	70%	60%	67%
Ecuador	88%	49%	71%	92%	74%	86%
El Salvador	87%	62%	74%	89%	76%	82%
Grenada	96%	97%	97%	96%	97%	97%
Guatemala	82%	62%	68%	83%	79%	81%
Guyana	97%	81%	86%	97%	81%	87%
Haiti	33%	19%	22%	44%	29%	34%
Honduras	88%	41%	60%	93%	55%	75%
Jamaica	99%	99%	99%	99%	99%	99%
Mexico	87%	26%	71%	88%	34%	74%
Nicaragua	97%	53%	76%	95%	72%	85%
Panama	99%	83%	92%	99%	87%	94%
Paraguay	96%	91%	93%	94%	93%	94%
Peru	77%	21%	56%	79%	49%	71%
Saint Kitts and Nevis	98%	100%	99%	96%	96%	96%
Saint Lucia	94%	94%	94%	96%	96%	96%
Saint Vincent and the Grenadines	96%	96%	96%	96%	96%	96%
Suriname	99%	75%	91%	99%	75%	93%
Trinidad and Tobago	99%	99%	99%	99%	99%	99%
Uruguay	95%	85%	94%	95%	85%	94%
Venezuela	71%	48%	67%	71%	48%	68%
Weighted Average	**84%**	**43%**	**72%**	**86%**	**53%**	**78%**

Source: WHO/UNICEF 2001. Projections per country (Access to Improved Sanitation and Drinking Water Sources)

Appendix II
Cost Analysis

DRINKING WATER:
ESTABLISHMENT OF UNIT COSTS

Group I

Brazil

For the cost per person in urban areas the data used was the PAHO-WHO (Assessment 2000) figure of US$152 per capita for urban household connections. For rural areas an average was calculated between the unit cost of wells with handpumps (US$180 per capita) and protected wells (US$60 per capita), resulting in a cost per capita of US$120.

Investment needs in rural areas are estimated in a way such that the coverage percentage with different modes of access is kept constant, so the cost estimated is 0.33*US$152 + 0.64*US$120 = US$ 130 per capita.

Mexico

The PAHO-WHO unit cost database only includes the cost of urban household connections, of US$ 172 per person. In order to estimate the cost of other types of supply sources, it was assumed that the cost difference between Brazil and Mexico is proportional to the differences between urban household connections, that is, that Mexico's costs are 13% higher than Brazil's. This method results in an average cost for public access sources (handpump wells and protected wells) for the rural sector of US$135.6.

On the assumption that the proportion of rural population with access through household connections stays constant, the average cost per capita used for the rural sector is 96%*US$172 + 4%*US$135.6 = US$170. [40]

Group II

For this group of countries an average cost was estimated for each type of service, based on the data supplied by CEPIS-WHO (Assessment 2000).

This data is aligned with other isolated sources. Thus, for example, a CETI estimate results in an average urban household connection cost for Ecuador of US$89.63. Meanwhile, the costs estimated by the World Bank for rural wells in Bolivia, within a Water and Sanitation Program range from US$15 to US$18 per person.[41]

The unit cost of providing drinking water to the urban population will be US$89 for each of the five countries, while the cost for rural areas will result from a weighted average calculated on the basis of the cost of household connections (US$124/person) and the average cost of public access sources (US$51/person), according to the weight of each type of access.

[40] Coverage data by type of service was taken from CEPIS-WHO corresponding to Assessment 2000.
[41] Source: http://www.wsp.org/english/focus/bolivia/table2-8.html

Bolivia: 69.1%*US$124 + 30.9%*US$51 = US$102
Colombia: 100% household connections (US$124/person)
Ecuador: no investment required for rural areas.
Peru: 57.6%*US$124 + 42.4%*US$51 = US$93
Venezuela: 86.6%*US$124 + 13.4%*US$51 = US$115

	Urban Sector		Rural Sector			
	Household Connections	Public Connection	Household Connections	Public Connection	Wells with Handpumps	Protected Wells
Bolivia	16	120	98	98	80	n/a
Colombia	133	n/a	150	n/a	n/a	n/a
Ecuador	142	n/a	125	n/a	n/a	20
Peru	39	n/a	n/a	60	30	n/a
Venezuela	116	n/a	n/a	n/a	n/a	n/a
AVERAGE	**$ 89**	**$ 120**	**$ 124**	**$ 79**	**$ 55**	**$ 20**

Group III

The average cost was estimated based on data supplied by CEPIS-WHO. In the case of Argentina the CEPIS data was deemed to overestimate costs, due to a significant devaluation experienced by the country's currency. In order to mitigate this, Argentina's costs were adjusted by the nominal currency exchange-rate performance, and by the Construction Cost Index (ICC).

Given the dispersion of the available data, a geometric average was calculated for assessing the region's unit costs. On the other hand, given the absence of data on costs of public sources, the regional average used was calculated as a percentage of the cost of household connections, assuming a pro-rated difference between the cost of household connection and that of public sources in Argentina and in the region as a whole.

The average cost of access to a public supply source for the rural population is US$176, and results from the weighted average of the different types of public drinking water sources. The average cost per person in rural areas will depend on the ratio of household connections and public access sources of each country. In order to estimate costs this ratio is assumed to be kept constant.

Argentina: 92%*US$187 + 8%*US$176 = US$186
Chile: 69%*US$187 + 31%*US$176 = US$184
Paraguay: 86,3%*US$187 + 13.7%*US$176 = US$185.7
Uruguay: 60.5%*US$187 + 39.5%*US$176 = US$183

	Urban Sector		Rural Sector			
	Household Connections	Public Connection	Household Connections	Public Connection	Wells with Handpumps	Protected Wells
Argentina	64	44	123	84	154	246
Chile	617	n/a	486	n/a	n/a	n/a
Paraguay	160	n/a	110	n/a	n/a	n/a
Uruguay	180	n/a	n/a	n/a	n/a	n/a
AVERAGE	**$184**	**$ 127**	**$ 187**	**$ 127**	**$ 154**	**$246**

Group IV

The costs used for this group are the average of the available data for each type of service in the various countries.

The cost of public access sources in rural areas results from averaging the unit cost of public system connection and wells, at US$46 per inhabitant.

	Urban Sector		Rural Sector			
	Household Connections	Public Connection	Household Connections	Public Connection	Wells with Handpumps	Protected Wells
Belize	25	n/a	n/a	n/a	n/a	n/a
Costa Rica	n/a	n/a	n/a	n/a	n/a	n/a
Cuba	300	n/a	160	40	60	130
El Salvador	225	100	n/a	100	85	n/a
Guatemala	57	n/a	38	23	n/a	n/a
Haiti	150	50	100	30	20	n/a
Honduras	83	15	83	15	24	15
Nicaragua	25	25	7	7	31	n/a
Panama	130	n/a	85	45	n/a	25
Dominican Republic	142	n/a	121	n/a	n/a	n/a
AVERAGE	**$ 126**	**$ 48**	**$ 85**	**$ 37**	**$ 44**	**$ 57**

Group V

A geometric average was used in order to estimate the average cost by type of service for this group of countries, as the CEPIS-WHO data was very heterogeneous.

The average access cost to a public supply source in rural areas is US$155 per person.

	Urban Sector		Rural Sector			
	Household Connections	Public Connection	Household Connections	Public Connection	Wells with Handpumps	Protected Wells
Antigua and Barbuda	1260	1260	1260	1260	n/a	n/a
Bahamas	450	n/a	450	n/a	n/a	250
Barbados	n/a	n/a	n/a	n/a	n/a	n/a
Dominican Republic	n/a	n/a	736	n/a	n/a	n/a
Granada	475	n/a	432	n/a	n/a	n/a
Guyana	n/a	n/a	n/a	n/a	n/a	n/a
Jamaica	150	15	140	14	n/a	n/a
Saint Kitts and Nevis	28	28	28	28	n/a	n/a
Santa Lucia	n/a	n/a	n/a	n/a	n/a	n/a
San Vicente and the Gr.	108	n/a	n/a	n/a	n/a	n/a
Suriname	150	n/a	120	25	n/a	n/a
Trinidad and Tobago	100	100	n/a	n/a	n/a	n/a
AVERAGE	**$ 192**	**$ 86**	**$ 263**	**$ 59**	**n/a**	**$ 250**

SANITATION SEWAGE:
ESTABLISHMENT OF UNIT COSTS

Group I

The cost of supplying a person with sanitation was estimated based on the data supplied by CEPIS/PAHO.

For Mexico the only unit cost provided is sewage with household connection in urban areas. The remaining costs were estimated assuming that the cost difference with Brazil is proportional to the different types of connections.

The investment demand was estimated on the assumption that the urban population would receive access to a sewage system by means of a household connection. For the rural population the figure used was the average of household connection costs and the cost of other types of access, weighted by the ratio of the various types of service as of 2000.

Brazil: 24.30%*US$ 110 + 75.70*US$62 = 74
Mexico: 33%*US$139 + 67%* US$ 41 = US$52

	Urban Sector		Rural Sector		Household Connection and Septic Tank	Latrine with Water Discharge	Dry Latrine	Simple Bored-Hole Latrine
	Sewage System with Household Connection	Small Diameter Sewage	Sewage System with Household Connection	Small Diameter Sewage				
Brazil	$ 210,00	$ 110,00	n/a	n/a	$ 95,00	$ 73,00	$ 40.00	$ 40,00
Mexico	$ 139,46	$ 73,05	$ 110	n/a	$ 63,09	$ 48,48	$ 26,56	$ 26,56

Group II

The regional unit cost was estimated based on the unit costs provided by CEPIS/WHO.

The cost of access to rural sanitation by means other than connection to the sewage system was estimated as the average of the different types of access, calculated at US$76.

For each country, the cost of providing sanitation service to a person in rural areas is the weighted average of the cost of sewage system and the costs of other types of access, according to the distribution as of 2000.[42]

Bolivia: 7%*US$ 118 + 93%*US$76 = US$79
Colombia: 100%*US$118
Ecuador: 28%*US$118 + 72%*US$76 = US$88
Peru: 55%*US$ 118 + 45%*US$76 = US$99
Venezuela: 87%*US$ 118 + 13%*US$76 = US$113

	Urban Sector		Rural Sector		Household Connection and Septic	Latrine with Water Discharge	Dry Latrine	Simple Bored-Hole Latrine
	Sewage System with Household Connection	Small Diameter Sewage	Sewage System with Household	Small Diameter Sewage				
Bolivia	$ 24.60	n/a	n/a	n/a	n/a	$ 35.00	n/a	$ 19.00
Colombia	$ 180.00	n/a	$ 100.00	n/a	n/a	n/a	n/a	n/a
Ecuador	$ 155.00	$ 130.00	$ 145.00	$ 130.00	$ 100.00	$ 100.00	$ 80.00	$ 60.00
Peru	$ 48.80	n/a	$ 110.00	$ 57.00	n/a	$ 44.00	$ 44.00	n/a
Venezuela	$ 102.00	n/a	n/a	n/a	n/a	n/a	$ 100.00	$ 80.00
AVERAGE	$ 102.08	-	$ 118.33	$ 93.50	$ 100.00	$ 59.67	$ 74.67	53

[42] According to Assessment 2000 data.

Group III

The regional unit cost was estimated based on the unit costs provided by CEPIS/WHO.

The cost of access to rural sanitation by means other than connection to the sewage system was estimated as the average of the different types of access, calculated at US$ 65.

For each of the four countries comprising the group, the average cost for rural areas was estimated as the weighted average of providing access by household connection and of providing access by other types of service.

Argentina: 2%*US$445* + 98%*US$65 = US$73
Chile: 42%*US$445* + 58%*US$65 = US$208
Paraguay: 100%*US$65 = US$65
Uruguay: 2.4%*US$445* + 97.6%*US$65 = US$74

	Urban Sector		Rural Sector					
	Sewage System with Household Connection	Small Diameter Sewage	Sewage System with Household Connection	Small Diameter Sewage	Household Connection and Septic Tank	Latrine with Water Discharge	Dry Latrine	Simple Bored-Hole Latrine
Argentina	$ 123.00	$ 98.40	$ 196.80	$ 172.20	n/a	$ 56.58	$ 39.36	$ 24.60
Chile	$ 390.00	n/a	$ 1,546.20	$ 444.20	$ 96.80	$ 73.90	$ 71.00	$ 41.20
Paraguay	$ 300.00	n/a	n/a	$ 150.00	n/a	n/a	n/a	$ 60.00
Uruguay	$ 300.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AVERAGE	**$ 278.25**		**445,2**		**$ 96.80**	**$ 65.24**	**$ 55.18**	**$ 41.93**

Group IV

The costs used for this group of countries were estimated as the average of available data for each type of service in the different countries.

The cost of access to sanitation in rural areas by “in-situ” service was estimated at US$55 por person.

For each country, the cost for providing sanitation to a person living in rural areas was estimated as the weighted average of providing sanitation through household connection to a sewage system and through “in-situ” service, according to the weightings as of 2000.

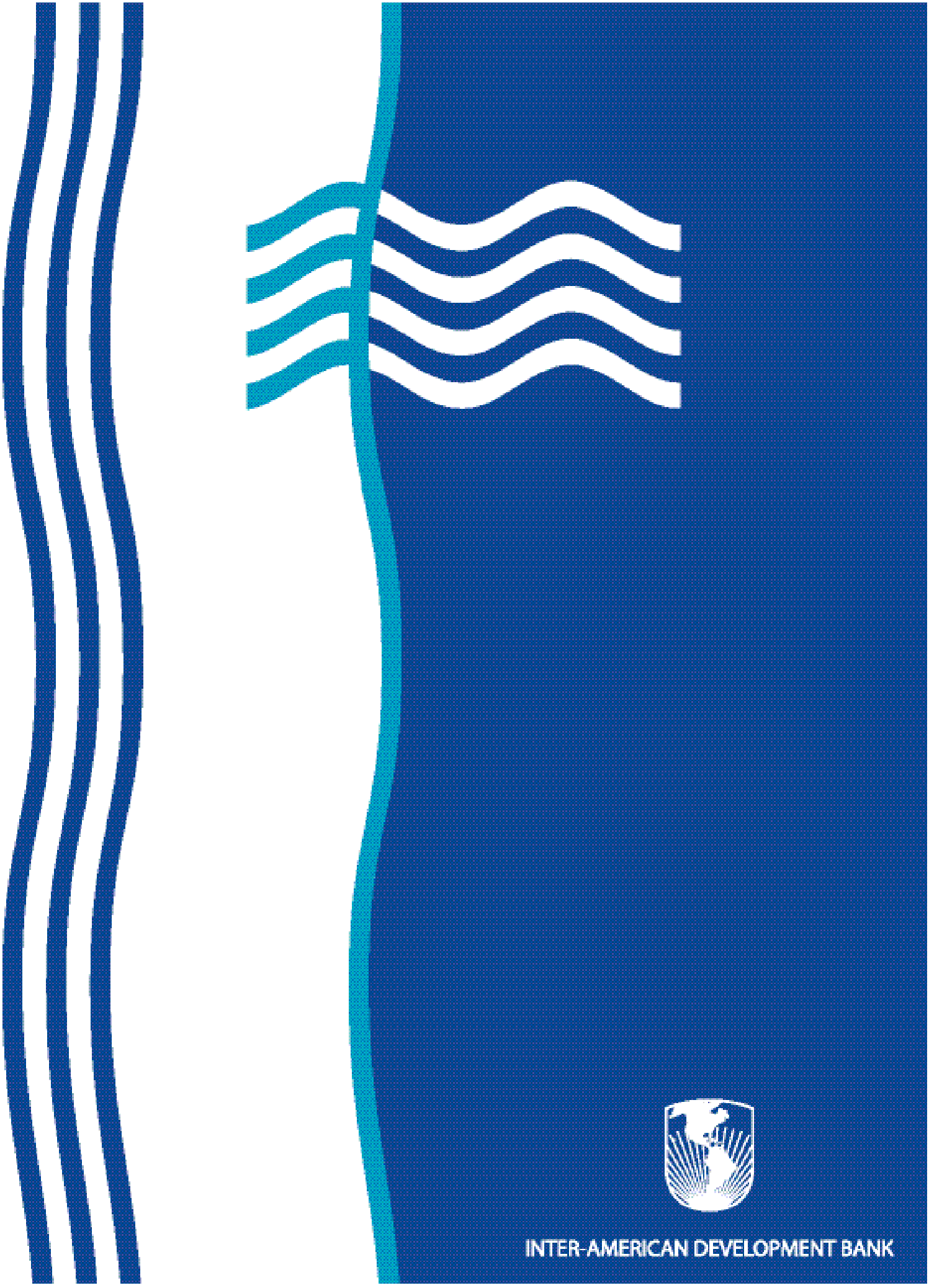
	Urban Sector		Rural Sector					
	Sewage System with Household Connection	Small Diameter Sewage	Sewage System with Household Connection	Small Diameter Sewage	Household Connection and Septic Tank	Latrine with Water Discharge	Dry Latrine	Simple Bored-Hole Latrine
Belize	$ 25	n/a	n/a	n/a	n/a	n/a	n/a	$ 2
Costa Rica	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cuba	$ 400	n/a	$ 300	n/a	$ 100	$ 20	$ 15	$ 10
El Salvador	$ 200	n/a	n/a	n/a	$ 300	n/a	n/a	$ 60
Guatemala	$ 11	n/a	n/a	n/a	n/a	n/a	$ 24	$ 8
Haiti	n/a	n/a	n/a	n/a	$ 80	$ 25	$ 20	$ 18
Honduras	$ 156	n/a	$ 108	n/a	$ 93	$ 29	$ 32	$ 22
Nicaragua	$ 18	n/a	n/a	n/a	n/a	n/a	$ 31	n/a
Panama	$ 192	n/a	$ 162	n/a	n/a	n/a	$ 30	$ 56
Dominican Republic	$ 149	n/a	n/a	n/a	n/a	n/a	$ 41	n/a
AVERAGE	$ 144		$ 190		$ 143	$ 25	$ 28	$ 25

Group V

As with connection costs for drinking water, the data on sanitation costs provided by CEPIS/WHO for the countries in this group is very heterogeneous. Therefore, a geometric average was used to estimate the average cost by type of service.

The average cost of access to sanitation in rural areas through "in-situ" services was estimated at US$130 per inhabitant.

	Urban Sector		Rural Sector		Household Connection and Septic Tank	Latrine with Water Discharge	Dry Latrine	Simple Bored-Hole Latrine
	Sewage System with Household Connection	Small Diameter Sewage	Sewage System with Household Connection	Small Diameter Sewage				
Antigua and Barbuda	n/a	n/a	n/a	n/a	$ 500.00	$ 400.00	n/a	$ 300.00
Bahamas	$ 675.00	n/a	n/a	n/a	$ 125.00	n/a	n/a	n/a
Barbados	$ 7.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dominica	n/a	n/a	n/a	n/a	$ 350.00	n/a	n/a	$ 50.00
Granada	$ 1,030.00	n/a	$ 1,500.00	n/a	$ 285.00	n/a	n/a	$ 80.00
Guyana	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jamaica	$ 275.00	n/a	$ 330.00	n/a	n/a	n/a	$ 70.00	n/a
Saint Kitts and Nevis	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Santa Lucia	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
San Vicente and the Gr.	$ 1,272.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Suriname	n/a	n/a	n/a	n/a	$ 55.00	n/a	n/a	$ 10.00
Trinidad and Tobago	$ 250.00	n/a	n/a	n/a	$ 300.00	n/a	n/a	$ 60.00
AVERAGE	$ 274		$ 364		$ 216	$ 173	$ 70	$ 59


INTER-AMERICAN DEVELOPMENT BANK