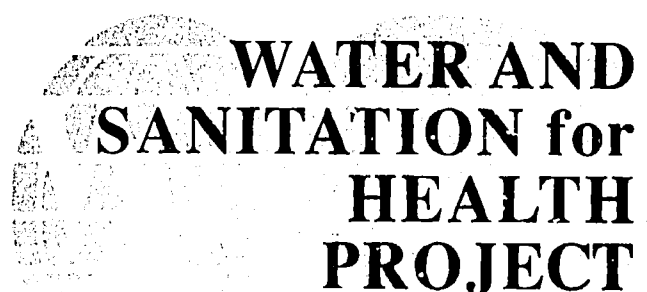


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PLANNING FOR WATER AND SANITATION
PROGRAMS IN THE CARIBBEAN

Field Report No. 303
June 1990



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WASH Field Report No. 303

**PLANNING FOR WATER AND SANITATION
PROGRAMS IN THE CARIBBEAN**

Prepared for the Bureau for Latin American and the Caribbean,
U.S. Agency for International Development
under WASH Task 073

by

David Ey

June 1990

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RELATED WASH REPORTS

Water Supply and Sanitation in the Health Sector of the Asia Region: Information Needs and Program Priorities. Technical Report No. 36, February 1986.

LAC Bureau: Planning for Central America Water Supply and Sanitation Programs. Field Report No. 209, May 1987.

Planning for Central America Water Supply and Sanitation Programs: Update. Field Report No. 253, May 1989.

Water and Sanitation Sector Profiles of Twenty African Countries. Field Report No. 291, June 1989.

Planning for Central America Water and Sanitation Programs. Field Report No. 301, June 1990.

Planning for Water and Sanitation Programs in Bolivia, Ecuador, and Peru. Field Report No. 302, June 1990.

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ACRONYMS

A.I.D.	Agency for International Development (United States)
CAASD	<i>Corporación de Acueductos y Alcantarillados de Santo Domingo</i> (Santo Domingo Water and Sewerage Corporation)
CAMEP	<i>Centrale Autonome Metropolitaine d'Eau Potable</i> (Urban potable water corporation, Haiti)
CARE	An international private voluntary organization
CCCE	<i>Caisse Centrale de Coopération Economique</i> (French agency for economic cooperation)
CDB	Caribbean Development Bank
CIDA	Canadian International Development Agency
CIHI	Center for International Health Information
CORAASAN	<i>Corporación de Acueductos y Alcantarillados de Santiago</i> (Santiago Water and Sewerage Corporation—Dominican Republic)
CWC	Central Water Commission (Grenada)
DA	Development Assistance
DHP	<i>Direction d'Hygiène Publique</i> (Ministry of Public Health, Haiti)
EEC	European Economic Community
ESF	Economic Support Fund
GDP	Gross Domestic Product
GNP	Gross National Product
GOB	Government of Barbados
GODR	Government of the Dominican Republic
GOG	Government of Grenada

GOH	Government of Haiti
GOJ	Government of Jamaica
GTZ	German Agency for Technical Cooperation
HG	Housing Guarantee Funds (A.I.D.)
IDB	Inter-American Development Bank
IMF	International Monetary Fund
INAPA	<i>Instituto Nacional de Agua Potable y Alcantarillado</i> (Dominican Republic's national water and sanitation agency)
ISTI	International Science and Technology Institute, Inc.
KfW	Reconstruction Loan Corporation (Federal Republic of Germany)
LAC	Bureau for Latin America and the Caribbean (A.I.D.)
MOH	Ministry of Health
NGO	Nongovernmental organization
NWC	National Water Commission, Jamaica
PAHO	Pan American Health Organization (unit of World Health Organization)
POCHEP	<i>Post Communautaire d'Hygiène Publique et d'Eau Potable</i> (Haiti rural water and sanitation agency)
PVO	Private voluntary organization
RDO/C	Regional Development Office/Caribbean (A.I.D.)
RHUDO	Regional Housing and Urban Development Office (A.I.D.)
SESPAS	<i>Secretaría de Estado de Salud Pública y Asistencia Social</i> , unit of the Ministry of Public Health, Dominican Republic
SGA	<i>Service du Genie Sanitaire et l'Assainissement</i> , unit of the Ministry of Public Health, Haiti
SNEP	<i>Service National d'Eau Potable</i> , Haiti National Water Service
SSID	<i>Servicios Sociales de Iglesias Dominicanas</i> , Dominican PVO

UDC	Urban Development Corporation (Jamaica)
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development/overseas missions
VACS	Voluntary Agencies for Child Survival Project
WASH	Water and Sanitation for Health Project
WS&S	Water Supply and Sanitation
WHO	World Health Organization

EXECUTIVE SUMMARY

Background

Since 1987, the Water and Sanitation for Health (WASH) Project has, at the request of the Latin America and Caribbean (LAC) Bureau of the U.S. Agency for International Development (A.I.D.), conducted an annual analysis of water supply and sanitation coverage levels and funding needs in Central America. In 1989, the LAC Bureau expanded its study to include selected Andean and Caribbean nations. This report is the first on the water and sanitation sector of the Caribbean countries of Barbados, the Dominican Republic, Grenada, Haiti, and Jamaica.

The objectives of this study are similar to those of the Central America and Andean reports: (1) to determine existing levels of coverage (the number of people with access to basic water and sanitation services), (2) to assess levels of investment currently committed by external support agencies and local governments to increase the availability of water and sanitation services, and (3) to develop target goals for 1995 as a means of focusing attention on the need to expand coverage in the region and on the level of investment which will be needed to meet these goals.

Water and Sanitation Coverage (1985-1989)

The five Caribbean countries under study fall into two groups relative to their current coverage rates in potable water and sanitation. The first comprises Barbados, Grenada, and Jamaica. These three countries have high coverage rates, 100 percent in Barbados and Jamaica and slightly less in Grenada. Infrastructure development efforts in these countries focus less on the construction of basic water and sanitation facilities, such as community standpipes and pit latrines, and more on the upgrading and expansion of existing water and sewerage systems to increase the reliability and effective coverage of service. Since this report focuses upon the provision of at least minimal water and sanitation facilities, such as community standpipes and pit latrines, efforts in these three countries to upgrade existing systems are not reflected in the coverage levels or the 1995 targets discussed in this report.

In the second group, comprising Haiti and the Dominican Republic, water and sanitation coverage rates are much lower. In Haiti, for example, fewer than one in eight rural residents had access to basic sanitation facilities in 1989 and fewer than one in three had access to potable water. These two countries are clearly in need of expanding the availability of these basic services to a greater percentage of their population.

Since 1985, when the overall potable water coverage for the five countries was at 54 percent, progress has been made in providing potable water to an additional 1.6 million persons. Each of the countries, except Haiti, succeeded in increasing the percentage of its population with coverage, which resulted in an overall potable water coverage rate of 60 percent in 1989. In the sanitation sector, however, expansion efforts were not as successful; only 283,000 persons gained access to adequate facilities in the period from 1985 to 1989. Overall, sanitation coverage rates fell from 55 percent in 1985 to 52 percent in 1989. Again, Haiti's coverage rates fell during this period, as did the rural sanitation level reported by the Dominican Republic. Table 1 presents the percentages of each country's urban and rural population with access to at least basic potable water and sanitation services in 1989.

Table 1

1989 WATER SUPPLY AND SANITATION COVERAGE LEVELS *

	URBAN		RURAL	
	Water	Sanitation	Water	Sanitation
Barbados	100 %	100 %	100 %	100 %
Dom. Rep.	89	79	27	34
Grenada **	91	96	N/A	N/A
Haiti	54	38	29	12
Jamaica	100	100	100	100
Combined	84	75	38	32

* Percentage of population with access to basic services.

** For Grenada, no urban/rural distinction was possible; therefore, all data have been considered as urban.

1995 Targets

For the purposes of tracking progress in the expansion of water and sanitation facilities and projecting the funding needs of each country, the WASH Project has constructed a model of overall coverage expansion which establishes as a goal full water and sanitation coverage in Barbados, the Dominican Republic, Grenada, Haiti, and Jamaica within 30 years, by 2020. Targets for 1995 are developed and analyzed in Chapters 2 and 3 of this report. The 1995 targets represent the first stage in achieving full coverage by 2020 and have been set as percentage targets; that is, they indicate gains to be made in the percentage of the population with access to water and sanitation facilities. The targets are specific to each of the four subsectors within each country, and progress toward achieving these targets will be

tracked and reported in future studies. It should be noted that these targets were not developed with country participation and do not, therefore, reflect specific country goals. Rather, they are intended as a means of focusing attention on the level of effort and funding needed if higher levels of water and sanitation coverage are to be achieved for urban and rural populations in these countries.

As seen in Table 2, the 1995 targets are set to increase the combined urban water coverage for the five countries by 4 percentage points, to 88 percent; rural water coverage by 13 percentage points, to 51 percent; urban sanitation by 6 points, to 81 percent; and rural sanitation by 13 points, to 45 percent.

Table 2

1995 WATER SUPPLY AND SANITATION COVERAGE TARGETS *

	URBAN		RURAL	
	Water	Sanitation	Water	Sanitation
Barbados	100 %	100 %	100 %	100 %
Dom. Rep.	93	85	43	48
Grenada **	100	100	N/A	N/A
Haiti	64	52	45	30
Jamaica	100	100	100	100
Combined	88	81	51	45

* Percentage of population with access to basic services.

** For Grenada, no urban/rural distinction was possible; therefore, all data have been considered as urban.

To achieve the 1995 goals, significant levels of funding will be required. This report estimates the total investment levels needed for each country to meet the 1995 targets, the level of funding currently committed to the effort to increase coverage, and existing shortfalls in funding. The concept of funds committed to increasing coverage used for each of the WASH reports includes only those monies that have been firmly committed and that will be used specifically to extend coverage to populations currently not served by water and sanitation facilities. Investments that will be used to rehabilitate existing water or sewerage systems or to provide other needed improvements that do not affect coverage are not included in the analysis.

Currently, international donors and local governments have committed an estimated \$39 million to coverage-expanding projects that are either ongoing or have been approved for

initiation in the next few years. In the case of ongoing projects, only those monies for 1990 and beyond have been considered. In addition, only those funds committed by local governments in conjunction with externally funded projects are included in the analysis. Given that approximately \$494 million will have to be spent over the next six years to achieve the 1995 targets, huge shortfalls in funding exist. Table 3 shows by country and by subsector the levels of additional funding needed to achieve the 1995 targets.

Table 3

SHORTFALLS IN FUNDING NEEDED TO MEET THE 1995 TARGETS

(Costs in 1989 US\$, 000s)

	URBAN		RURAL		TOTAL
	Water	Sanitation	Water	Sanitation	
Barbados	\$ 1,875	\$ 1,875	\$ 0	\$ 0	\$ 3,750
Dom. Rep.	100,130	115,560	24,833	12,867	253,390
Grenada	750	125	0	0	875
Haiti	49,062	17,596	38,614	23,084	128,356
Jamaica	36,125	33,525	0	0	69,650
TOTAL	\$187,942	\$168,681	\$63,447	\$35,951	\$456,021

The expansion of water and sanitation services to the extent called for by the 1995 targets can only occur as a result of a long-term approach to the development of the water and sanitation sector. Whereas Barbados, Grenada, and Jamaica either have the funding available to meet the targets or are negotiating with donors to receive funding for water and sanitation activities, Haiti and the Dominican Republic do not, and large funding shortfalls for these countries exist. The provision of services to a larger portion of the populations of Haiti and the Dominican Republic not only requires large amounts of additional funding, but the improvement of institutional capabilities within these countries so that the construction initiated as part of water and sanitation projects can be sustained and further expanded. In the case of Jamaica, efforts to upgrade existing facilities in low-income communities continue to be an important component of the country's infrastructure development program.

While the funding shortfall for the urban sector is over four times that for the rural sector, coverage levels in the rural sector are far below urban rates, and therefore, the funding of projects to extend coverage in the rural areas remains a priority. A.I.D. has played a leading role in the construction of water and sanitation facilities in rural areas. Clearly, this involvement should be sustained or expanded, if possible. In addition, A.I.D. has and should

continue to focus on providing water and sanitation services to marginal, low-income, urban communities, where coverage rates (like those in the rural areas) are substantially lower than the urban average. In the urban sector, however, the bulk of potential financing to support municipal water and sanitation construction projects comprises loans from the Inter-American Development Bank and the World Bank; in addition, the Government of Italy is sponsoring large urban water programs in the Dominican Republic.

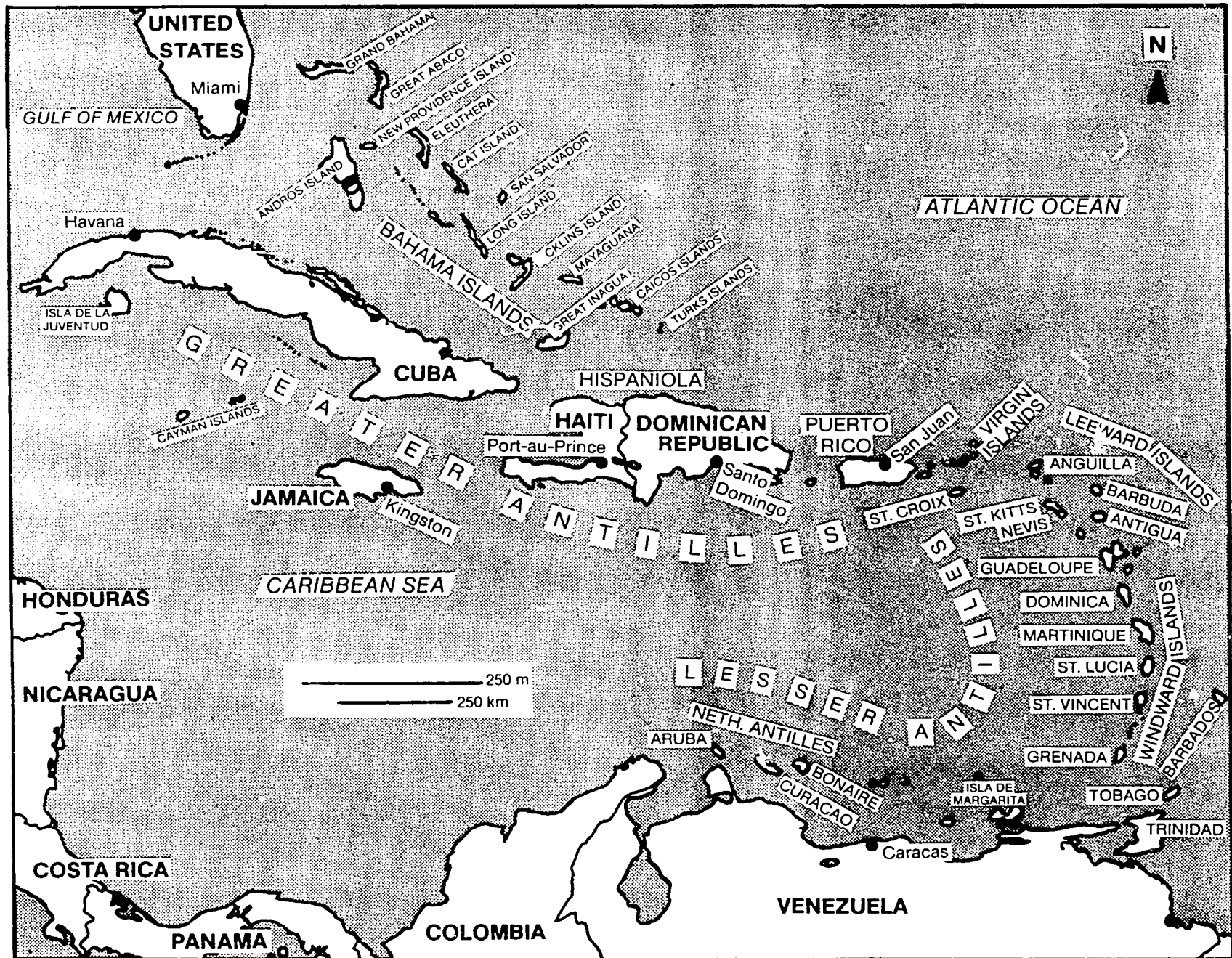
Of the Caribbean countries under study, Haiti and the Dominican Republic warrant consideration by A.I.D. for expanded water and sanitation programs. In particular, Haiti is in critical need of additional financing. With the conclusion of A.I.D.'s rural water and sanitation program with CARE in 1989, Haiti's ability to expand rural water and sanitation coverage in the rural areas of the country has become even more limited.

WASH's Lessons Learned

The WASH Project has learned over the past 10 years that the construction of water and sanitation systems alone is not enough to ensure the desired results of safe, accessible water and hygienic excreta disposal. Efforts to provide potable water and sanitary waste disposal must be integrated with other development activities. To succeed, water and sanitation projects must also provide hygiene education to communities served, train personnel in the operation and maintenance of the facilities, strengthen the local agencies and institutions which work in the water and sanitation sector, and involve the community to be served in the planning and execution of the project.

In WASH's experience, the realization of the goal of increased access to water and sanitation facilities also requires substantial coordination among all the various agencies and institutions involved in the sector, as well as a long-term commitment to build not only the systems themselves but the local institutional capacity to maintain them.

THE CARIBBEAN



1

INTRODUCTION

1.1 Purpose and Goals

Since 1987, the Water and Sanitation for Health (WASH) Project has, at the request of the Latin America and Caribbean (LAC) Bureau of the U.S. Agency for International Development (A.I.D.), conducted an annual analysis of water and sanitation coverage levels and funding needs in Central America.¹ In 1989, the LAC Bureau expanded the scope of its study to include selected Andean and Caribbean nations. This report, the first on the Caribbean countries of Barbados, the Dominican Republic, Grenada, Haiti, and Jamaica, will be updated annually through 1994.

The goals of this study are as follows:

- To collect and analyze available data (since 1985) on the number of persons with access to facilities in each of the four subsectors—urban water, rural water, urban sanitation, and rural sanitation.
- To develop coverage targets for 1995 for use by WASH and the LAC Bureau as tools to measure progress in each of the Caribbean countries in extending access to basic water and sanitation services to a larger percentage of the population.
- To describe ongoing and future water and sanitation projects and programs, including investment information, in each country.
- To estimate, using available information, the amount of investment currently committed to provide access to water and sanitation services to residents not served at this time and to determine what additional investments will be needed to meet the 1995 targets.

¹ The initial WASH report was *Planning for Central America Water Supply and Sanitation Programs*, WASH Field Report No. 209, November 1987; the first update, WASH Field Report No. 253, was published in May 1989.

1.2 Approach and Definitions

1.2.1 Sources

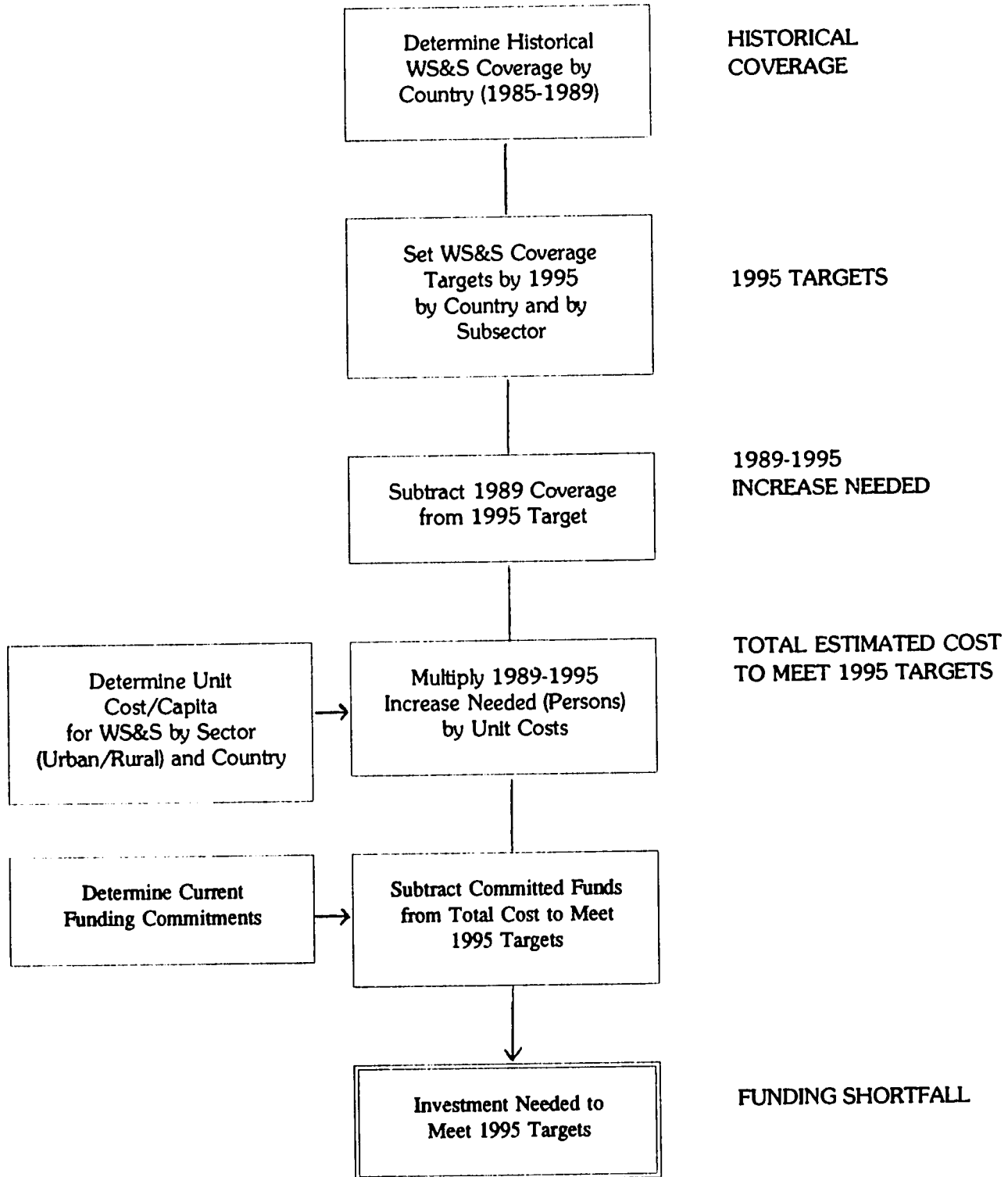
This report was prepared in Washington, D.C., from information provided by USAID missions and international donors working in Barbados, the Dominican Republic, Grenada, Haiti, and Jamaica. The USAID missions in the Dominican Republic and Haiti, the USAID Regional Housing and Urban Development Office (RHUDO)/Jamaica, and the Regional Development Office/Caribbean (RDO/C) provided current data on water and sanitation coverage and current and planned programs in each country. Per capita unit costs for the construction of additional water and sanitation connections were derived from information provided by the Pan American Health Organization (PAHO) and USAID missions. Other institutions contacted for information include the Inter-American Development Bank (IDB), the World Bank, the United Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP), CARE, the Canadian International Development Agency (CIDA), the West German Reconstruction Loan Corporation (KfW), the West German Agency for Technical Cooperation (GTZ), and *Caisse Centrale de Coopération Economique* (CCCE), the French economic cooperation agency.

1.2.2 Methodology

The methodology used to determine the funding needed to achieve the 1995 planning targets is described below and summarized on the accompanying chart:

- (1) Determine historical coverage data for the period between 1985 and 1989.
- (2) Develop 1995 subsector targets (urban and rural, water and sanitation) for each country.
- (3) Determine the total investment needed to meet the 1995 targets by subtracting the number of people with coverage in 1989 from the number with coverage at the 1995 target level and multiplying the resulting amount by the unit cost per capita of providing coverage.
- (4) Estimate the amount of funding currently committed to increase coverage using information from international donors working in the sector.

**METHODOLOGY FOR DETERMINING FUNDS
NEEDED TO MEET 1995 WASH TARGETS**



- (5) Calculate the funding shortfall to meet the 1995 targets by subtracting the amount that has been firmly committed at this time from the total amount of funding needed.

1.2.3 Definitional Framework

The definitional framework used for this study of Caribbean nations is identical to that used by WASH and the LAC Bureau in the Central America and Andean reports. In some cases, WASH has had to use its best judgment to bring data based upon different assumptions into conformity with the definitions given below.

Urban and Rural Populations

Population centers of over 2,000 persons are considered to be urban; all others are rural.

Water Supply Coverage

Water supply is available either through direct connection or from a water system outlet (standpipe or public fountain) within 200 meters of the home.

Sanitation Coverage

Sanitation service is provided by an in-house or in-compound sewerage connection, septic tank, or at a minimum, a latrine.

It should be noted that the level of service may vary greatly between the different types of service (e.g., direct connection versus community standpipe) and between countries. For example, one city may be served with a water distribution system but, due to shortages in the water supply, water is not available for more than a few hours a day. Another city, however, may be served continuously. In this study, however, it is not possible to make such distinctions in the quality of coverage, and all persons reported to have coverage, as defined above, are considered to have at least minimal access to water and/or sanitation services.

Noninfrastructure Projects

Noninfrastructure projects are an essential component of the effort to improve the water and sanitation sector in each country. These projects, which support the institutional development of national and municipal water and sewerage agencies, nongovernmental organizations (NGOs), and local water companies, also provide much needed training of personnel in the

management and operations and maintenance aspects of water and sanitation systems. The need for both increased efficiency and an improved capability to sustain existing water and sanitation services is well recognized. However, these projects do not directly provide for the expansion of services, and therefore, expenditures for such projects are not included in this study as investments which increase coverage.

Excluded Funds

Some of the large loans made by the IDB, the World Bank, and the Government of Italy have not been considered in their entirety in the investment analysis. These loans, which support the rehabilitation of existing water and sewerage systems and/or the construction of off-site facilities (e.g., treatment plants, dams, and reservoirs) are used to improve or sustain the quality of services and are not focused on extending coverage to unserved populations. Frequently, these investments do support some system expansion, and for the purpose of this report, 10 percent of the total loan has been considered as funding which supports the expansion of water and sanitation services. A detailed analysis of the funding commitments included in the investment analysis is provided in each of the country profile appendixes at the end of the report.

1.3 Report Organization

This study is organized into three chapters and five appendixes. Following this introduction, Chapter 2 discusses the water and sanitation data for the five countries, including current and past coverage levels, the 1995 WASH targets, and currently committed investments. Chapter 3 examines the shortfalls in funding to meet the 1995 targets. The country profile appendixes provide a more detailed discussion of the water and sanitation sector for each of the five countries. Located at the end of each appendix are the following tables and figures:

Table 1	Actual Water Supply Coverage Versus 1995 Targets
Table 2	Actual Sanitation Coverage Versus 1995 Targets
Table 3	Investment Needed to Meet the 1995 Targets
Figure 1	Urban and Rural Water Supply Coverage
Figure 2	Urban and Rural Sanitation Coverage
Figure 3	1989 Coverage and 1995 Targets (by the number of persons with coverage)
Figure 4	1989 Coverage and 1995 Targets (by the percentage of the population with access)
Figure 5	Total Investment Needed to Meet the 1995 Targets

1.4 Additional Planning Reports

As noted earlier, the LAC Bureau has commissioned similar reports on Central America and three Andean countries. The 1989 Central America report (WASH Field Report No. 301) examines the water and sanitation sectors of Belize, Guatemala, Honduras, El Salvador, and Costa Rica. The Andean report (WASH Field Report No. 302) covers the countries of Bolivia, Ecuador, and Peru. Each study will be updated annually through 1994.

2

WATER SUPPLY AND SANITATION IN THE CARIBBEAN

Data on water and sanitation coverage levels (the number of persons with access to basic water and sanitation services) and population figures for 1985 and 1989 were obtained from each of the Caribbean USAID missions, RHUDO/Jamaica, and RDO/C, and PAHO. Much of the information provided by these agencies was obtained directly from national sources—water and sewerage agencies, coordinating committees, and census bureaus. In some cases, population or coverage figures were adjusted to conform with the definitional framework used in this study. A more detailed discussion of the data sources for each country can be found in the country profile appendixes.

It should be noted that changes in water and sanitation coverage data can occur in lumps; that is, the reported coverage level may rise quickly over a short period of time as a major system is completed. This does not mean, however, that a country can bring all the potential users on line simultaneously or that it can sustain that rate of growth. Rather, the expansion of water and sanitation facilities to significantly greater percentages of a country's population occurs over an extended period of time. Overall, however, the coverage figures included in this report, although approximate in nature, should provide a reasonably accurate picture (for sector planning purposes) of the water and sanitation sectors of the Caribbean nations of Barbados, the Dominican Republic, Grenada, Haiti, and Jamaica.

2.1 Population and Coverage Trends, 1985-1989

Relative to their water and sanitation coverage rates, the five Caribbean countries under study fall into two groups. The first consists of Barbados, Grenada, and Jamaica. These three countries have high coverage rates, 100 percent in Barbados and Jamaica and slightly less in Grenada. Infrastructure development efforts in these countries focus less on the construction of basic water and sanitation facilities, such as community standpipes and pit latrines, and more on the upgrading and expansion of existing water and sewerage systems to increase the reliability and effective coverage of service. Since this report focuses upon the provision of at least minimal water and sanitation facilities, such as community standpipes and pit latrines, efforts in these three countries to upgrade existing systems are not reflected in the coverage levels or the 1995 targets discussed in this report.

In the second group, which comprises Haiti and the Dominican Republic, water and sanitation coverage rates are much lower. In Haiti, for example, fewer than one in eight rural residents had access to basic sanitation facilities in 1989 and fewer than one in three had access to potable water (Tables 1 and 2 and Figures 1 and 2). These two countries are

clearly in need of expanding the availability of these basic services to a greater percentage of their population.

Since 1985, when the overall potable water coverage for the five countries was at 54 percent, progress has been made in providing potable water to an additional 1.6 million persons. Each of the countries, except Haiti, succeeded in increasing the percentage of its population with coverage, which resulted in an overall potable water coverage rate of 60 percent in 1989. In the sanitation sector, however, expansion efforts were not as successful; only 283,000 persons gained access to adequate facilities in the period 1985-1989. Overall, sanitation coverage rates fell from 55 percent in 1985 to 52 percent in 1989. Again, Haiti's coverage rates fell during this period, as did the rural sanitation level reported by the Dominican Republic.

During 1985-1989, the combined population of the five countries grew by 1.35 million persons, less than the coverage increase achieved for potable water but significantly more than that for sanitation facilities. In Grenada and among the rural populations of Barbados and Jamaica, the population actually decreased in these years, a trend that is expected to continue.

In an effort to encourage the extension of water and sanitation projects to both urban and rural communities, the World Health Organization (WHO) attracted the attention of the international donor community and local governments by its declaration of the 1980s as the International Drinking Water Supply and Sanitation Decade. Although the initial time frame of the Decade has expired, it is expected that countries will continue to recognize the importance of water and sanitation coverage for improved health and will continue their efforts to extend coverage to unserved populations. In Haiti and the Dominican Republic, there continues to be a need for additional projects to expand the availability of water and sanitation to both rural and urban residents.

2.2 The 1995 Targets

For the purposes of tracking progress in the expansion of water and sanitation facilities and projecting the funding needs of each country, the WASH Project has constructed a model of overall coverage expansion which establishes as a goal full water and sanitation coverage in Barbados, the Dominican Republic, Grenada, Haiti, and Jamaica within 30 years, by 2020. The 1995 targets developed and discussed in this report represent the first stage in achieving full coverage in each of the subsectors of this study by 2020: urban water, urban sanitation, rural water, and rural sanitation. The 1995 targets, however, were not developed with country participation and are not, therefore, reflective of specific country goals. Rather, they are intended as a means of focusing attention on the level of effort and funding needed if increasing levels of water and sanitation coverage are to be provided for both urban and rural populations in these countries.

TABLE - 1

WATER SUPPLY COVERAGE:
1985 AND 1989 COVERAGE LEVELS

		WATER SUPPLY								
YEAR	TOTAL POPULATION	ALL AREAS		URBAN AREAS			RURAL AREAS			
		POP. SERVED	% SERVED	URBAN POP.	TOTAL SERVED	% SERVED	RURAL POP.	TOTAL SERVED	% SERVED	
BARBADOS	1985:	253	252	100 %	107	107	100 %	146	145	99 %
	1989:	259	259	100 %	115	115	100 %	144	144	100 %
DOM. REP.	1985:	6,416	3,097	48 %	3,498	2,363	68 %	2,918	734	25 %
	1989:	7,019	4,416	63 %	4,065	3,618	89 %	2,954	798	27 %
GRENADA *	1985:	86	77	90 %	86	77	90 %			
	1989:	85	77	91 %	85	77	91 %			
HAITI	1985:	5,269	1,992	38 %	1,405	826	59 %	3,864	1,166	30 %
	1989:	5,866	2,123	36 %	1,600	870	54 %	4,266	1,253	29 %
JAMAICA	1985:	2,326	2,326	100 %	1,233	1,233	100 %	1,093	1,093	100 %
	1989:	2,466	2,466	100 %	1,464	1,464	100 %	1,002	1,002	100 %
TOTAL:	1985:	14,350	7,744	54 %	6,329	4,606	73 %	8,021	3,138	39 %
	1989:	15,695	9,341	60 %	7,329	6,144	84 %	8,366	3,197	38 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

* NO DISTINCTION BETWEEN URBAN AND RURAL POPULATIONS WAS POSSIBLE; THEREFORE, ALL DATA FOR GRENADA ARE CONSIDERED URBAN FOR THE PURPOSES OF THIS TABLE.

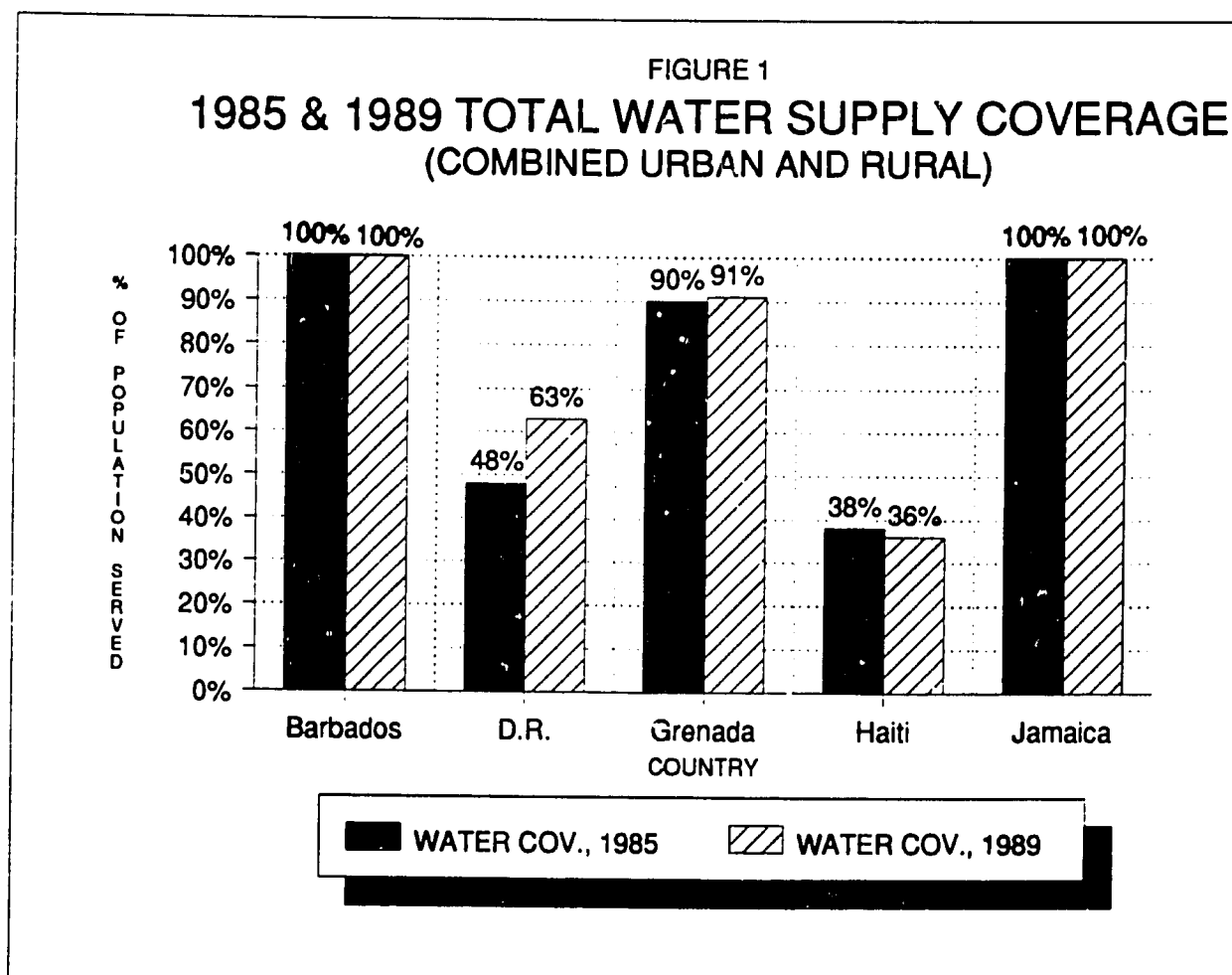


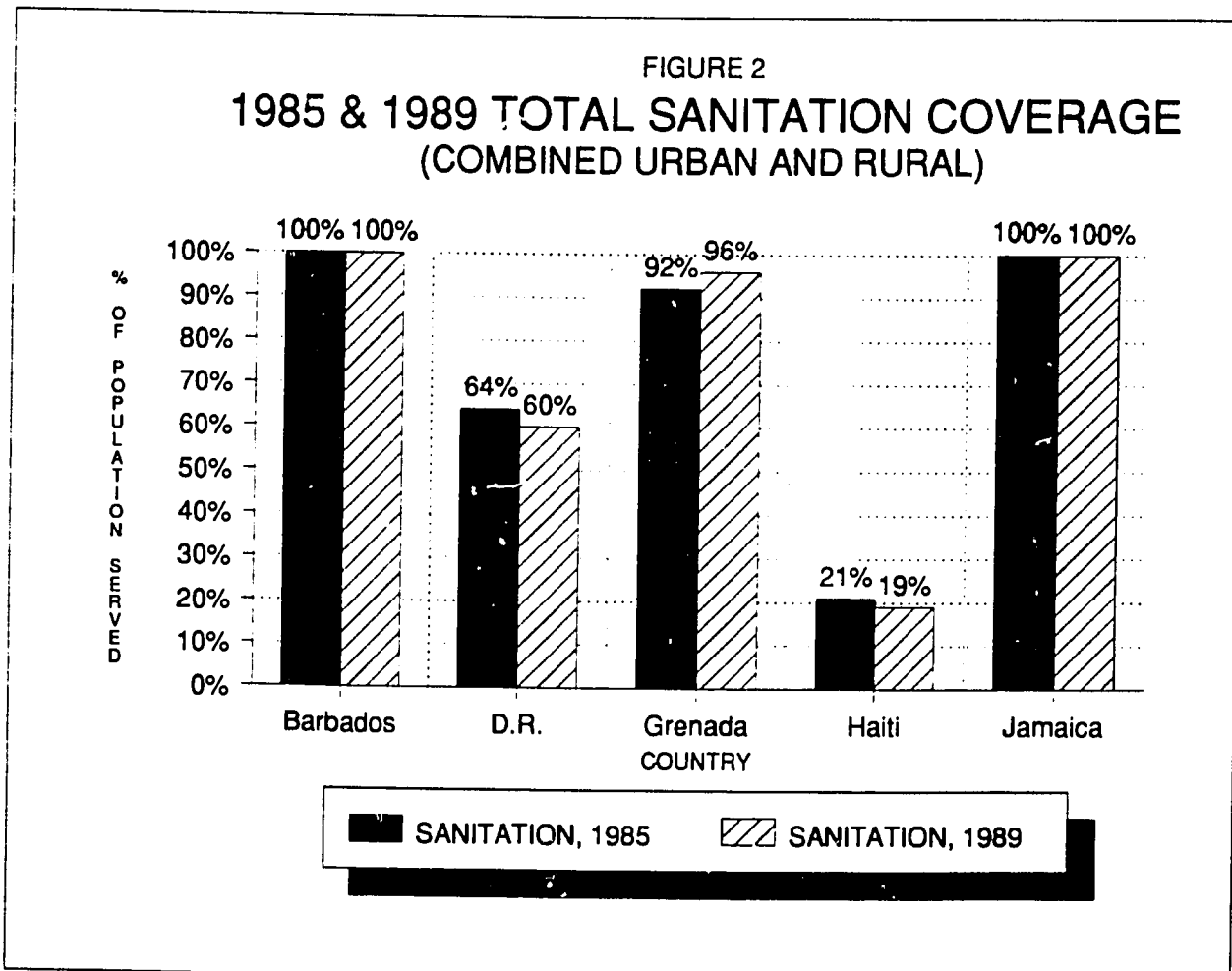
TABLE - 2

SANITATION COVERAGE:
1985 AND 1989 COVERAGE LEVELS

		SANITATION								
YEAR	TOTAL POPULATION	ALL AREAS		URBAN AREAS			RURAL AREAS			
		POP. SERVED	% SERVED	URBAN POP.	TOTAL SERVED	% SERVED	RURAL POP.	TOTAL SERVED	% SERVED	
BARBADOS	1985:	253	253	100 %	107	107	100 %	146	146	100 %
	1989:	259	259	100 %	115	115	100 %	144	144	100 %
DOM. REP.	1985:	6,416	4,101	64 %	3,498	2,325	66 %	2,918	1,776	61 %
	1989:	7,019	4,215	60 %	4,065	3,211	79 %	2,954	1,004	34 %
GRENADA *	1985:	86	79	92 %	86	79	92 %			
	1989:	85	82	96 %	85	82	96 %			
HAITI	1985:	5,269	1,107	21 %	1,405	592	42 %	3,864	515	13 %
	1989:	5,866	1,127	19 %	1,600	607	38 %	4,266	520	12 %
JAMAICA	1985:	2,326	2,326	100 %	1,233	1,233	100 %	1,093	1,093	100 %
	1989:	2,466	2,466	100 %	1,464	1,464	100 %	1,002	1,002	100 %
TOTAL:	1985:	14,350	7,866	55 %	6,329	4,336	69 %	8,021	3,530	44 %
	1989:	15,695	8,149	52 %	7,329	5,479	75 %	8,366	2,670	32 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

* NO DISTINCTION BETWEEN URBAN AND RURAL POPULATIONS WAS POSSIBLE; THEREFORE, ALL DATA FOR GRENADA ARE CONSIDERED URBAN FOR THE PURPOSES OF THIS TABLE.



To set the 1995 targets, the 1989 coverage levels for each subsector were divided into percentile ranges: 90-99 percent coverage, 80-89 percent coverage, etc. Percentage-point increases were then calculated to establish the rate of coverage expansion necessary for the countries to attain full coverage in 30 years. Because coverage levels in each country vary widely, the rate of expansion needed to attain full coverage varies accordingly; subsectors with lower coverage rates in 1989 (i.e., rural water and sanitation) require larger percentage-point increases than those subsectors with high coverage rates (i.e., urban water and sanitation). As seen in Table 3, this rate of expansion is incrementally greater by 2 percentage points for each 10-point drop in current coverage rates. To calculate the 1995 targets, actual coverage rates for each of the four subsectors in each country were inflated by the corresponding percentage increase shown in Table 3. For example, Haiti currently has a rural water supply coverage rate of 29 percent. The 20-29 percentile range calls for an increase of 16 percentage points in six years, which makes the 1995 target for Haiti's rural water supply subsector 45 percent (29 + 16). It should be noted, however, that since urban areas are facing more rapid population growth than rural areas, the attainment of smaller percentage-point gains in the urban sector requires the addition of more new connections than in the rural sector.

In the countries of Barbados and Jamaica, which had full water and sanitation coverage in both rural and urban areas, the 1995 targets are simply to maintain full coverage in the face of population growth over this six-year period.

It should also be noted that the 1995 targets for Grenada do not follow this methodology. Since Grenada already has high coverage rates and a population which is decreasing, the 1995 targets for the country have been set at 100 percent for both water and sanitation, which will require minimal increases in the number of persons with coverage.

Table 3

1995 TARGET CALCULATION

<u>Current Coverage *</u>	<u>Required Six-Year Increase **</u>	<u>Coverage 1995 Target ***</u>	<u>2020 Target</u>
100%	-----	100%	100%
90-99%	+ 2 pts.	92%	100%
80-89%	+ 4 pts.	84%	100%
70-79%	+ 6 pts.	76%	100%
60-69%	+ 8 pts.	68%	100%
50-59%	+ 10 pts.	60%	100%
40-49%	+ 12 pts.	52%	100%
30-39%	+ 14 pts.	44%	100%
20-29%	+ 16 pts.	36%	100%
10-19%	+ 18 pts.	28%	100%
0-9%	+ 20 pts.	20%	100%

* Ten-point percentile range.

** Increase in percentage points (e.g., 80 percent to 84 percent coverage is a 4-point gain).

*** Target percentages shown represent the increase over the low end of the range shown in the first column.

The actual 1995 targets for each of the countries, along with the 1989 coverage levels, are shown in Tables 4 and 5 and Figures 3 and 4. For the region as a whole, the targets are set to increase access to water in the combined urban and rural populations from 60 percent in 1989 to 70 percent in 1995. The combined regional sanitation target is set to increase coverage from the current 52 percent to 63 percent by 1995. In terms of the number of additional people with service, nearly 3 million more people with access to basic service must be added in both the water and sanitation sectors to meet the 1995 targets (Table 6).

TABLE - 4

WATER SUPPLY COVERAGE:
1989 COVERAGE LEVELS VS. 1995 TARGETS

		WATER SUPPLY								
YEAR	TOTAL POPULATION	ALL AREAS		URBAN AREAS			RURAL AREAS			
		POP. SERVED	% SERVED	URBAN POP.	TOTAL SERVED	% SERVED	RURAL POP.	TOTAL SERVED	% SERVED	
BARBADOS	1989:	259	259	100 %	115	115	100 %	144	144	100 %
	1995:	272	272	100 %	130	130	100 %	142	142	100 %
DOM. REP.	1989:	7,019	4,416	63 %	4,065	3,618	89 %	2,954	798	27 %
	1995:	8,045	5,977	74 %	5,036	4,683	93 %	3,009	1,294	43 %
GRENADA *	1989:	85	77	91 %	85	77	91 %			
	1995:	83	83	100 %	83	83	100 %			
HAITI	1989:	5,866	2,123	36 %	1,600	870	54 %	4,266	1,253	29 %
	1995:	6,463	3,282	51 %	1,969	1,260	64 %	4,494	2,022	45 %
JAMAICA	1989:	2,466	2,466	100 %	1,464	1,464	100 %	1,002	1,002	100 %
	1995:	2,640	2,640	100 %	1,769	1,769	100 %	871	871	100 %
TOTAL:	1989:	15,695	9,341	60 %	7,329	6,144	84 %	8,366	3,197	38 %
	1995:	17,503	12,254	70 %	8,987	7,925	88 %	8,516	4,329	51 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

* NO DISTINCTION BETWEEN URBAN AND RURAL POPULATIONS WAS POSSIBLE; THEREFORE, ALL DATA FOR GRENADA ARE CONSIDERED URBAN FOR THE PURPOSES OF THIS TABLE.

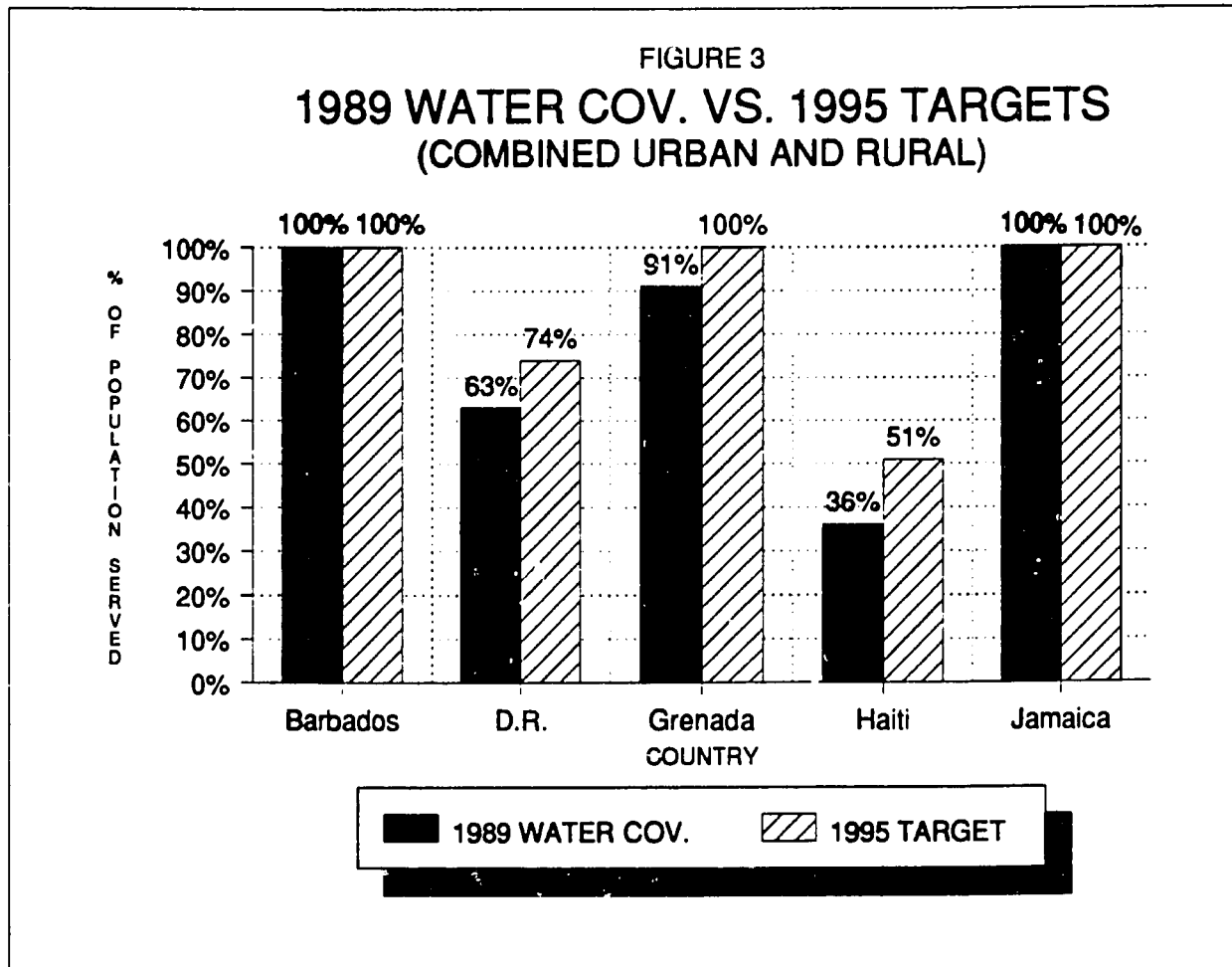


TABLE - 5

SANITATION COVERAGE:
1989 COVERAGE LEVELS VS. 1995 TARGETS

		SANITATION								
YEAR	TOTAL POPULATION	ALL AREAS		URBAN AREAS			RURAL AREAS			
		POP. SERVED	% SERVED	URBAN POP.	TOTAL SERVED	% SERVED	RURAL POP.	TOTAL SERVED	% SERVED	
BARBADOS	1989:	259	259	100 %	115	115	100 %	144	144	100 %
	1995:	272	272	100 %	130	130	100 %	142	142	100 %
DOM. REP.	1989:	7,019	4,215	60 %	4,065	3,211	79 %	2,954	1,004	34 %
	1995:	8,045	5,725	71 %	5,036	4,281	85 %	3,009	1,444	48 %
GRENADA *	1989:	85	82	96 %	85	82	96 %			
	1995:	83	83	100 %	83	83	100 %			
HAITI	1989:	5,866	1,127	19 %	1,600	607	38 %	4,266	520	12 %
	1995:	6,463	2,372	37 %	1,969	1,024	52 %	4,494	1,348	30 %
JAMAICA	1989:	2,466	2,466	100 %	1,464	1,464	100 %	1,002	1,002	100 %
	1995:	2,640	2,640	100 %	1,769	1,769	100 %	871	871	100 %
TOTAL:	1989:	15,695	8,149	52 %	7,329	5,479	75 %	8,366	2,670	32 %
	1995:	17,503	11,092	63 %	8,987	7,287	81 %	8,516	3,805	45 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

* NO DISTINCTION BETWEEN URBAN AND RURAL POPULATIONS WAS POSSIBLE; THEREFORE, ALL DATA FOR GRENADA ARE CONSIDERED URBAN FOR THE PURPOSES OF THIS TABLE.

FIGURE 4
1989 SANITATION COV. VS. 1995 TARGETS
(COMBINED URBAN AND RURAL)

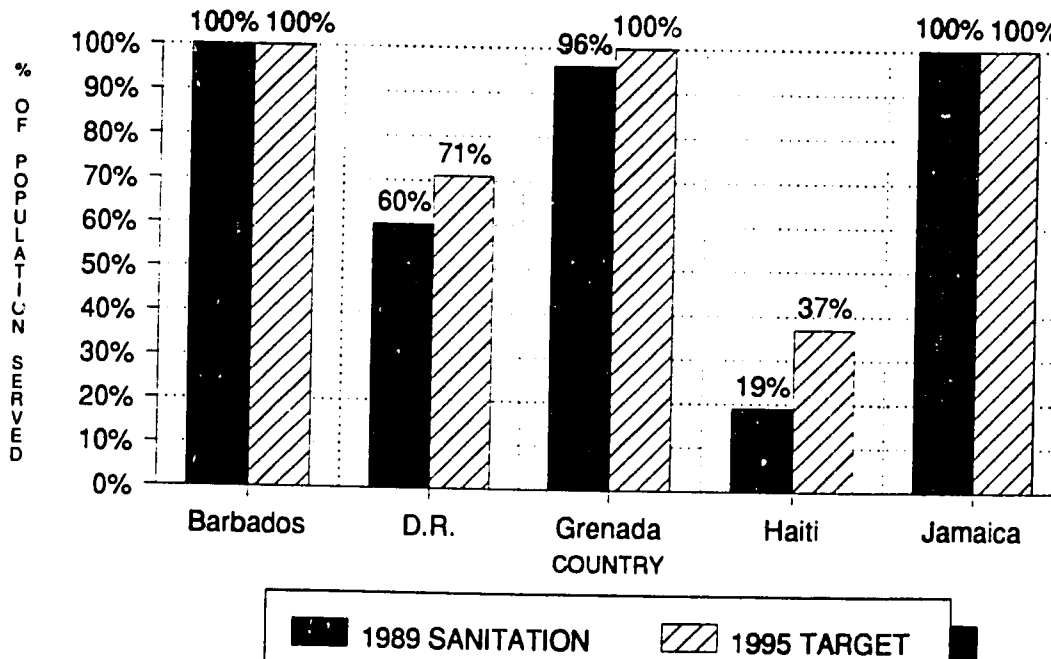


TABLE - 6

INCREASE OVER 1989 COVERAGE LEVELS
NEEDED TO MEET 1995 TARGETS

	WATER SUPPLY			SANITATION		
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL
BARBADOS	15	15	0	15	15	0
DOM. REP.	1,561	1,065	496	1,510	1,070	440
GRENADA	6	6		1	1	
HAITI	1,159	390	769	1,245	417	828
JAMAICA	305	305	0	305	305	0
TOTAL	3,046	1,781	1,265	3,076	1,808	1,268

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

2.3 Funding Commitments and Shortfalls

In Table 7, the current funding commitments for each of the five countries are shown. The amounts in this table reflect investments that have been firmly committed and will be used to extend coverage to persons currently not served by basic water or sanitation services. As noted in Chapter 1, some of the current water and sanitation programs in these countries contribute only partially to increasing coverage. The rehabilitation of existing systems, the construction of off-site facilities such as transmission mains, reservoirs and treatment plants, and the provision of technical assistance to strengthen the institutional capacities of national agencies working in the water and sanitation sector are important to the development of the sector, but such activities do not directly increase coverage. For such projects, only 10 percent of the total project funds was considered to be allocated to increasing coverage (Table 7).

TABLE - 7

COMMITTED FUNDING TO INCREASE COVERAGE

(COSTS IN 1989 US\$, 000s)

COUNTRY	TOTAL	WATER SUPPLY		SANITATION	
		URBAN	RURAL	URBAN	RURAL
BARBADOS	\$0	\$0	\$0	\$0	\$0
DOM. REP.	\$17,728	\$8,500	\$8,895	\$0	\$333
GRENADA	\$0	\$0	\$0	\$0	\$0
HAITI	\$14,350	\$9,048	\$4,450	\$752	\$100
JAMAICA	\$6,600	\$2,000	\$0	\$4,600	\$0
TOTAL	\$38,678	\$19,548	\$13,345	\$5,352	\$433

As of the end of 1989, approximately \$39 million had been committed to water and sanitation projects to expand coverage. Of the five countries, the Dominican Republic and Haiti currently have the largest amount of committed investments, nearly \$18 million and \$14 million, respectively. These two countries, however, also face the largest funding shortfalls. Jamaica also currently receives foreign aid to support water and sanitation development; Barbados and Grenada do not have any investments currently committed to expand water and sanitation coverage. Following is a breakdown by donor of firmly committed investments to increase water and sanitation coverage levels in the five countries. Only government funds committed in conjunction with programs of external support agencies are included in this analysis.

Source	Committed Investments To Increase Coverage (1990-1995)
National Counterpart Funds	\$9,000,000
Italy	8,500,000
World Bank	5,000,000
A.I.D.	4,250,000
IDB	3,500,000
West Germany	3,300,000
EEC	2,600,000
France	2,000,000
Others	528,000
TOTAL	\$38,678,000

As seen in the tabulation, a number of external support agencies are important sources of funds for water and sanitation projects in these Caribbean countries. In particular, A.I.D. has been a major supporter of projects which expand services to populations currently without access to basic water and sanitation facilities, especially in rural and peri-urban areas. The figures above do not show, however, the relative importance of the IDB and the World Bank in financing the rehabilitation and upgrading of large municipal systems. These large projects, although not directly focused on extending coverage, play a critical role in maintaining existing water and sewerage systems serving major population centers and enable the future expansion of those systems.

To determine the funding needed to meet the 1995 targets, the estimated number of additional persons with coverage needed for each of the four subsectors in each country (Table 6) was multiplied by the unit cost per capita of coverage expansion for each subsector in each country (see country profiles in the appendixes). To obtain the amount of additional investment needed, the amount currently committed for expanding coverage was subtracted from the total cost of meeting the targets.

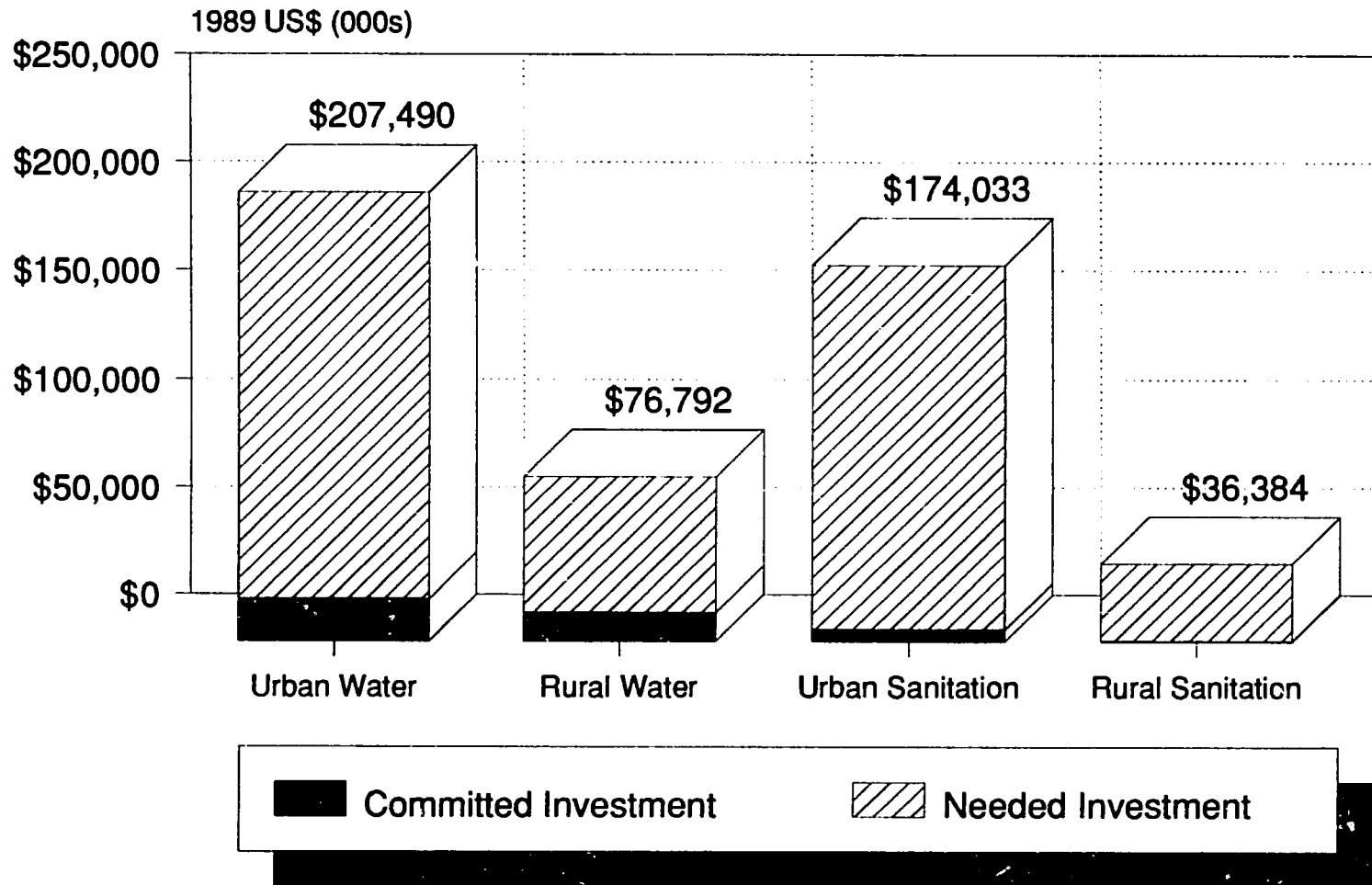
As seen in Table 8, the funding needed to increase access to water supplies is approximately \$284 million for the five countries. With almost \$33 million of that amount currently committed to this effort, a shortfall of \$251 million remains. The funding shortfall for sanitation facility construction and expansion is lower, \$205 million. Overall, the total shortfall in funding needed to meet the 1995 water and sanitation targets in each of the countries is estimated at \$456 million. Figure 5 provides a graphic display of the total investment required to meet the 1995 targets for the five countries in each subsector, broken down between currently committed investments (shaded areas) and investment shortfalls (striped areas).

TABLE - 8
ESTIMATED FUNDING NEEDED
TO MEET 1995 TARGETS
(COSTS IN 1989 US\$, 000s)

	WATER SUPPLY			SANITATION			TOTAL
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	
BARBADOS-- MEET 1995 GOALS *	1,875	1,875	0	1,875	1,875	0	3,750
COMMITTED FUNDING	0	0	0	0	0	0	0
FUNDS NEEDED	1,875	1,875	0	1,875	1,875	0	3,750
DOM. REP-- MEET 1995 GOALS *	142,358	108,630	33,728	128,760	115,560	13,200	271,118
COMMITTED FUNDING	17,395	8,500	8,895	333	0	333	17,728
FUNDS NEEDED	124,963	100,130	24,833	128,427	115,560	12,867	253,390
GRENADA-- MEET 1995 GOALS *	750	750	0	125	125	0	875
COMMITTED FUNDING	0	0	0	0	0	0	0
FUNDS NEEDED	750	750	0	125	125	0	875
HAITI-- MEET 1995 GOALS *	101,174	58,110	43,064	41,532	18,348	23,184	142,706
COMMITTED FUNDING	13,498	9,048	4,450	852	752	100	14,350
FUNDS NEEDED	87,676	49,062	38,614	40,680	17,596	23,084	128,356
JAMAICA-- MEET 1995 GOALS *	38,125	38,125	0	38,125	38,125	0	76,250
COMMITTED FUNDING	2,000	2,000	0	4,600	4,600	0	6,600
FUNDS NEEDED	36,125	36,125	0	33,525	33,525	0	69,650
TOTAL MEET 1995 GOALS *	284,282	207,490	76,792	210,417	174,033	36,384	494,699
COMMITTED FUNDING	32,893	19,548	13,345	5,785	5,352	433	38,678
FUNDS NEEDED	251,389	187,942	63,447	204,632	168,681	35,951	456,021

* FROM THE 1989 BASE LEVEL OF COVERAGE

FIGURE 5
CARIBBEAN COUNTRIES--TOTAL FUNDING
NEEDED TO MEET 1995 TARGETS



3

CONCLUSIONS

In Chapter 2, the population and coverage trends in the Caribbean countries were discussed. The 1995 targets, which aim to track progress toward the provision of potable, easily accessible water and acceptable sanitary excreta disposal facilities to all residents of Barbados, the Dominican Republic, Grenada, Haiti, and Jamaica by the year 2020, were also presented. Finally, the funding currently committed by external donors and the local governments to finance the expansion of services was calculated. This chapter examines the prospects for achieving the 1995 targets in each of the five countries. The conclusions are based on the more detailed analysis of each country in the country profile appendixes.

3.1 Prospects for Meeting the 1995 Targets

3.1.1 Barbados

Given that Barbados currently has full coverage in urban and rural water and sanitation, the targets have been set to maintain this level of coverage through 1995. Though the country's rural population is expected to decline slightly from 1989 to 1995, Barbados's urban population is projected to increase by 15,000 persons. To meet this increase and maintain full urban coverage, nearly \$4 million will be needed for the expansion of water and sanitation systems. While financing for this work has not yet been committed, the IDB is evaluating a sanitation loan to the Government of Barbados, which would provide funds sufficient to meet the urban sanitation target. There is no immediate source of external funding, however, to meet the urban water target.

3.1.2 Dominican Republic

The 1995 targets for the Dominican Republic have been set to increase coverage percentages substantially in all four subsectors. In the urban water subsector, the 1995 target has been set to raise coverage from the 1989 level of 89 percent to 93 percent of the urban population in 1995. To attain this level of expansion in the face of rapid urbanization, an additional 1.1 million persons will have to gain access to a water supply. In the urban sanitation subsector, another 1.1 million urban residents will have to gain access to adequate sanitation facilities to meet the 1995 target of 85 percent, an increase of 6 percentage points over the 1989 coverage level. In the rural areas, where coverage rates are currently 27 percent and 34 percent for water and sanitation access, respectively, the targets are set

to increase coverage to 43 percent for water and 48 percent for sanitation. These targets reflect increases of 496,000 and 440,000 in the number of people in rural areas with access to water systems and latrines, respectively.

The financing required to meet the Dominican Republic's 1995 targets totals \$271 million, nearly \$18 million of which had been committed as of the end of 1989 to expand water and sanitation coverage. By subsector, the funding shortfalls are as follows: \$100 million for urban water, \$116 million for urban sanitation, \$25 million for rural water, and \$13 million for rural sanitation.

The IDB is currently preparing a loan which would finance water and sanitation expansion and improvements in the urban sector, though large funding shortfalls will remain in the urban sector even with this loan. In the rural sector, for which coverage rates in both water and sanitation are very low and additional financing is a high priority, no additional coverage-expanding projects are planned.

3.1.3 Grenada

The 1995 targets are set to raise Grenada's water and sanitation coverage levels to 100 percent. To accomplish this, an additional 6,000 persons will have to gain access to a water supply system and an additional 1,000 persons will have to be served by adequate sanitation facilities. The level of investment needed to meet these objectives is estimated to be \$875,000—\$750,000 for water system construction and expansion and \$125,000 for the construction of sanitation facilities. To date, no funds have been committed by external support agencies to meet these goals, though CIDA is considering a project which will satisfy these funding requirements.

3.1.4 Haiti

With the exception of the rural water subsector, Haiti has the lowest coverage rates in all subsectors of the Caribbean countries under study. In the urban sector, the 1995 targets are set to raise water supply coverage to 64 percent, an increase of 390,000 persons, and sanitation targets to 52 percent, an increase of 417,000 persons. The rural water and sanitation targets require even greater increases, because the majority of Haiti's population resides in the rural areas and coverage rates in these areas are extremely low. To raise the current rural water coverage level to 45 percent, an additional 769,000 persons will have to gain access to potable water. An estimated 828,000 persons will have to gain access to some form of adequate sanitation facility by 1995 to meet the rural sanitation target of 30 percent coverage.

Investments currently committed by external support agencies in conjunction with the Government of Haiti are insufficient to meet these goals. Of the \$58 million needed for

urban water system construction, only \$9 million has been committed to this effort at this time. Shortfalls in each of the other subsectors under study remain as well: \$18 million for urban sanitation, \$39 million for rural water supply, and \$23 million for rural sanitation. Proposed, but unsigned, loans to support water and sanitation development include a loan by the IDB to finance water and sewerage expansion and rehabilitation in intermediate-sized cities in the country. This loan, however, will not cover these shortfalls. Additional investments in rural water and sanitation are clearly needed if Haiti is to increase the availability of safe water and hygienic sanitation facilities to its population.

3.1.5 Jamaica

In Jamaica, the 1995 targets are set to maintain the 100 percent coverage currently provided in all four subsectors: urban water, rural water, urban sanitation, and rural sanitation. Given that Jamaica's urban population is projected to increase by 305,000 persons by 1995, an estimated \$76 million will be needed to meet the urban water and sanitation targets: \$38 million for urban water expansion and \$38 million for urban sanitation. In addition to the \$7 million currently committed to this effort, the IDB, the World Bank, A.I.D., and JICA are considering loans which, if approved, should provide nearly all of the financing needed to achieve the urban goals. In the rural sector, no increases in coverage are foreseen because the country's rural population is projected to decline by 131,000 persons from 1989 to 1995.

It should be noted that while Jamaica has high coverage levels of at least basic water and sanitation, the Jamaican Government and a number of external support agencies are actively working to upgrade many old, existing systems to provide higher-quality service to low-income areas in the country.

3.2 Regional Summary

The 1995 targets represent substantial challenges for Haiti and the Dominican Republic; Barbados, Grenada, and Jamaica will most likely be able to meet the targets of full coverage, though the upgrading of existing facilities remains a challenge for these three countries. If Haiti and the Dominican Republic are to be able to provide basic water and sanitation services to a larger percentage of their population at the same time that their populations are expanding, a great deal of additional funding will be required.

For the five countries as a whole, an estimated \$456 million in funding for coverage-expanding water and sanitation projects will be necessary to meet the 1995 goals. Of this amount, just \$39 million is currently committed to projects that will extend coverage. The funding shortfalls are, by subsector: \$188 million for urban water, \$63 million for rural water, \$169 million for urban sanitation, and \$36 million for rural sanitation.

As seen in Table 9, the shortfall in funding needed to meet the 1995 targets is largest in the urban water and sanitation sectors, which account for over three-quarters of the overall shortfall. The primary reason for this difference is the higher per capita unit cost of constructing urban versus rural water and sanitation facilities.

TABLE - 9
ESTIMATED FUNDING SHORTFALLS
TO MEET 1995 TARGETS
- BY URBAN AND RURAL AREAS*
(COSTS IN 1989 US\$, 000s)

COUNTRY	URBAN WATER SUPPLY AND SANITATION	RURAL WATER SUPPLY AND SANITATION	TOTAL
BARBADOS	\$3,750	\$0	\$3,750
DOM. REP.	\$215,690	\$37,700	\$253,390
GRENADA	\$875	\$0	\$875
HAITI	\$66,658	\$61,698	\$128,356
JAMAICA	\$69,650	\$0	\$69,650
TOTAL	\$356,623	\$99,398	\$456,021

* SEE TABLE 8 FOR BREAKDOWN OF COSTS TO MEET 1995 TARGETS.

On an annual basis, as shown in Table 10, the current funding shortfall totals \$76 million: \$31 million for urban water, \$28 million for urban sanitation, \$11 million for rural water, and \$6 million for rural sanitation.

TABLE - 10
ANNUAL COSTS
TO FUND SHORTFALLS AND MEET 1995 TARGETS
(IN 1989 US\$, 000s)

	URBAN AREAS		RURAL AREAS		TOTAL
	WATER SUPPLY	SANI-TATION	WATER SUPPLY	SANI-TATION	
BARBADOS	\$313	\$313	\$0	\$0	\$625
DOM. REP.	\$16,688	\$19,260	\$4,139	\$2,145	\$42,232
GRENADA	\$125	\$21	\$0	\$0	\$146
HAITI	\$8,177	\$2,933	\$6,436	\$3,847	\$21,393
JAMAICA	\$6,021	\$5,588	\$0	\$0	\$11,608
TOTAL:	\$31,324	\$28,114	\$10,575	\$5,992	\$76,004

NOTE: Determination of annual costs is based on dividing total funding needed by six (for FY1990 through 1995).

Totals have been rounded.

Shortfalls in funding, however, are just one obstacle (albeit a significant one) preventing these countries from further extending water and sanitation coverage. Country-specific political factors, external debts, the inability of local institutions to absorb funds that have been committed, and delays in implementation also threaten the ability of some countries to continue progress toward the goal of providing adequate water and sanitation coverage for urban and rural populations.

Although the funding shortfalls for the urban sector are notably larger than those in the rural sector, rural water and sanitation development should remain a priority because coverage levels for these subsectors are less than half of the urban water and sanitation coverage rates. A.I.D. has played an important role in the construction of water and sanitation facilities in rural areas in some of these countries, particularly in Haiti and the Dominican Republic. Within the urban sector, however, the IDB and, to a lesser extent, the World Bank provide the bulk of financing for large-scale projects in these areas.

On the basis of this study of current coverage and investment levels in each of the five Caribbean countries, Barbados, Grenada, and Jamaica are not in great need of coverage-expanding water and sanitation projects. In Haiti and, to a slightly lesser extent, in the Dominican Republic, A.I.D. should consider expanding its current level of investment in water and sanitation, particularly in the rural areas of these countries. Coverage levels for rural water and sanitation in both countries are very low (barely one in eight rural Haitians has access, at a minimum, to a pit latrine), and funding shortfalls to expand water and sanitation coverage in these countries are high.

The financing of water and sanitation projects, in most cases, involves both local and external financing. While A.I.D.'s water supply and sanitation projects are normally funded with Development Assistance (DA) funds, or in urban areas, through the Housing Guarantee (HG) program, in some cases the local funding component is also financed by A.I.D. through the Economic Support Fund (ESF) for countries lacking the necessary counterpart funding. Because of the dearth of available local funds, A.I.D. may have to use a combination of DA and ESF monies to fund both the external and local share of some water and sanitation projects. A.I.D. may also be able to assist countries with local capital formation to facilitate the increased availability of local counterpart funds for water and sanitation projects.

3.3 WASH's Lessons Learned

Over the past 10 years, the WASH Project has learned that the construction of water and sanitation systems alone is not enough to ensure the desired results of safe, accessible water and hygienic excreta disposal. Efforts to provide potable water and sanitary waste disposal must be integrated with other development activities. To succeed, water and sanitation projects must also provide hygiene education to communities served, train personnel in the operation and maintenance of the facilities, strengthen the local agencies and institutions

which work in the water and sanitation sector, and involve the community to be served in the planning and execution of the project.

While the focus of this report has been on those investments which directly expand coverage to previously unserved populations, investment in the development of the nonphysical infrastructure of the water and sanitation sector is also necessary and can contribute to expanded coverage as well. The enhancement of a country's absorptive capacity, through the provision of technical assistance and training for national institutions working in the sector, is critical to improving the efficient implementation and sustainability of water and sanitation projects. Through such efforts, costly delays caused by weak organizational structures, poor use of human resources, and inadequate project preparation can be averted. In addition to emphasizing the more efficient use of funds, other areas for improvement include the establishment of sound cost-recovery schemes, the reduction of unaccounted for water in urban systems, and the use of alternative technologies to lower construction costs, particularly for urban sanitation systems. The benefits of providing technical assistance to support these improvements will likely be seen in the future expansion of water and sanitation coverage, the improvement of existing systems, and the increased sustainability of these systems.

While donors play a crucial role in providing capital and technical assistance to support these efforts, local governments must establish and control development priorities for the sector. In addition, the communities themselves should be responsible for the facilities. The private sector can also play an important role in supporting the expansion and maintenance of water and sanitation facilities. Potential areas for local private sector involvement include the design of projects, the provision of materials (pipes, handpumps, cement, etc.), the construction of facilities, and the operation and maintenance of water and sanitation systems. In WASH's experience, the realization of the goal of increased access to water and sanitation facilities requires substantial coordination among all the various agencies and institutions involved in the sector, as well as a long-term commitment to build not only the systems themselves but the local institutional capacity to maintain them.

APPENDIXES

INTRODUCTION TO THE APPENDIXES

Profiles of each of the five Caribbean countries covered by this report are included as appendixes. At the start of each appendix, current health, economic, and social indicators are provided, along with a brief introduction. Following this background information is a detailed discussion of the water and sanitation sector: externally funded current and proposed projects in the country, current coverage levels, the 1995 targets, and investment needed to meet the 1995 goals. After the discussion of each donor's program in a country, the total amount of committed funding included in the investment analysis is indicated.

DATA SOURCES

The sources of the statistics cited at the beginning of each appendix are as follows.

1989 Population (Urban, Rural)

Population figures were provided by each of the USAID missions using figures from the government censuses. For Barbados and Grenada, population data were obtained from the U.S. Bureau of the Census. In cases in which the information was inconsistent with previously reported figures or other data, the USAID mission or WASH staff used their best judgment to determine accurate population figures.

Population Growth Rates (Urban, Rural)

These figures were also provided by USAID missions and the U.S. Bureau of the Census and reflect 1989 growth rates.

1995 Population (Urban, Rural)

Population figures for 1995 were extrapolated using 1989 population and growth rates reported by the USAID missions.

Infant Mortality Rate

The Center for International Health Information (CIHI), an A.I.D.-funded activity, provided these figures, which represent estimates for 1989 of the number of infant deaths (under one year old) per 1,000 live births.

Child Mortality Rate

Also obtained from CIHI, these numbers reflect the number of deaths among 1,000 children who, having reached the age of one, died before they were five years old.

Mortality Rate due to Diarrheal/Intestinal Diseases

These rates were obtained from USAID missions and the Ministry of Public Health in each of the countries. They represent the number of deaths from diarrheal/intestinal diseases per 1,000 deaths.

Life Expectancy (Total, Male, Female), Adult Literacy, GNP per Capita (\$1987), GNP per Capita Annual Growth from 1965-87, and Average Annual Inflation from 1980-87

The World Bank's *1989 World Development Report* was the source of these figures.

Currency

The foreign currency exchange rates in this report were obtained from the Bank of America Global Trading and reflect official currency rates as of May 5, 1990.

COVERAGE AND INVESTMENT TABLES AND FIGURES

At the conclusion of each appendix, a number of tables and accompanying graphs provide a numerical and visual summary of coverage and investment trends. The tables and graphs appear in the same order in each of the appendixes, though they may be referenced at different points in the text.

Actual Water Supply Coverage Versus 1995 Targets

Table 1 shows population and urban and rural coverage figures for the water sector for selected years from 1985 through 1989. The 1995 targets are also included in this table.

Urban and Rural Water Supply Coverage

Figure 1 provides a visual reference for following the trends in both urban and rural water supply coverage from 1985 through 1989. Coverage levels for those years which fall between the data points shown in Table 1 were projected as midpoints between the years for which data were available.

Actual Sanitation Coverage Versus 1995 Targets, Urban and Rural Sanitation Coverage

Table 2 and Figure 2 are identical in format to Table 1 and Figure 1. In this case, each refers to urban and rural sanitation coverage.

1989 Coverage and 1995 Targets (Persons with Coverage, % of Population with Coverage)

Figures 3 and 4 show existing 1989 coverage levels and the 1995 targets for each of the four subsectors of this study: urban water, rural water, urban sanitation, and rural sanitation. The unit of analysis in Figure 3 is number of people, and in Figure 4, it is the percentage of the population with coverage.

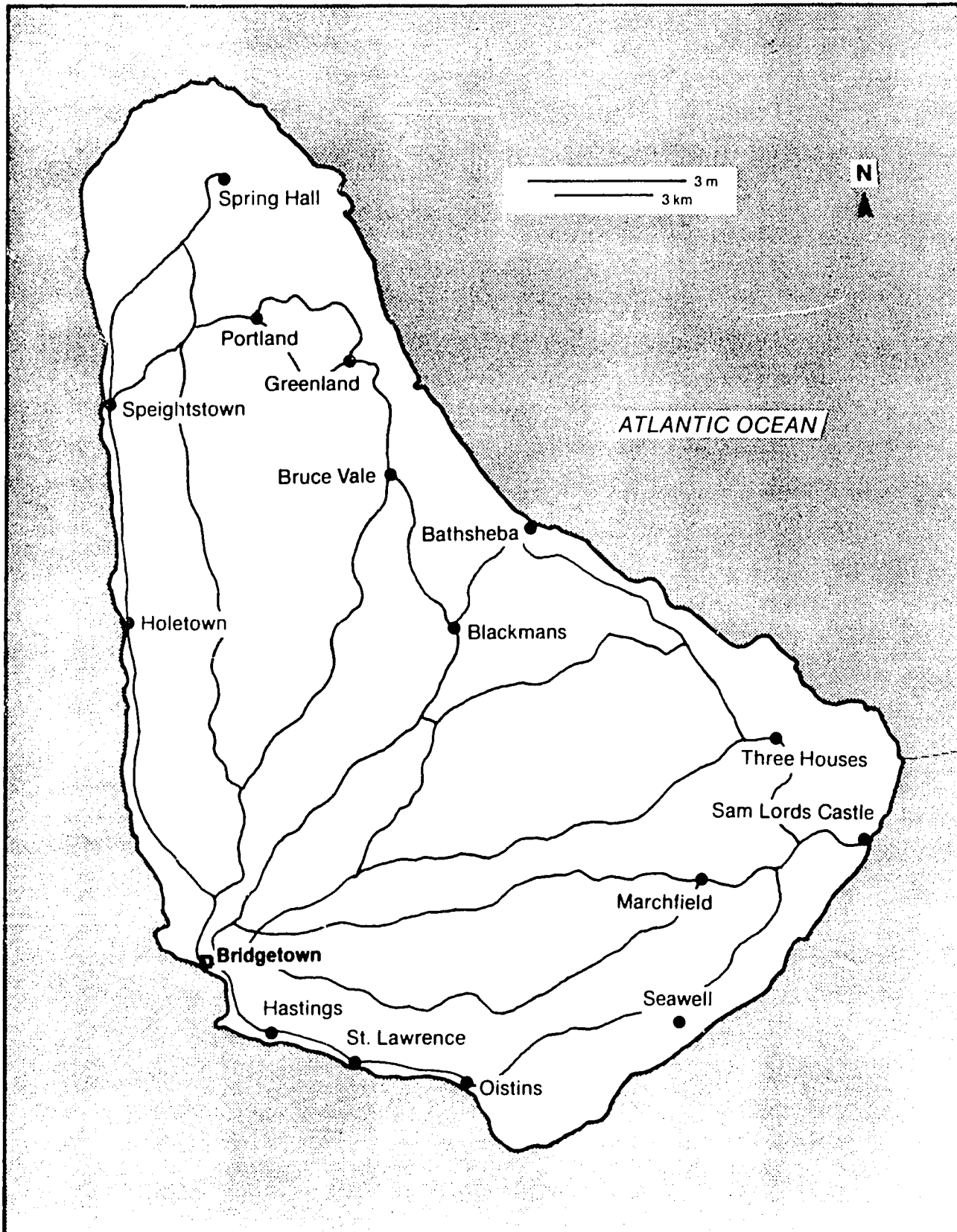
Investment Needed to Meet 1995 Targets

Table 3 presents the number of additional persons with coverage needed to meet the 1995 targets and the projected shortfall in funds needed to meet the 1995 targets. To calculate the latter, the number of additional persons with coverage needed to meet the 1995 targets was multiplied by the unit costs per capita of constructing water supply systems and sanitation facilities. The resulting product is the total investment needed to meet the targets. Subtracting currently committed investments that will increase coverage from the total investment needed provides the funding shortfall for meeting the 1995 targets. The unit costs per capita were obtained from PAHO and the USAID missions.

Total Investment to Meet 1995 Targets

Figure 5 shows committed and needed investments to meet the 1995 targets. The number at the top of each box represents the total amount of funding needed; currently committed investments are shown as partly filling in each box. The remaining space in the box represents the amount of needed investment yet to be committed.

BARBADOS



Appendix A

Country Profile: **BARBADOS**

COUNTRY BACKGROUND

One of the Caribbean Windward Islands, the country of Barbados has a land mass of 432 square kilometers. Of the five countries under study in the Caribbean, Barbados has the highest GNP per capita, at \$5,350 in 1989. The country currently enjoys a strong tourism industry and a manufacturing sector that is growing. Though growth in the period 1981-1983 was negative, Barbados's economy has since shown growth, and it is expected that the tourism industry, which has carried the country's economy since 1987, will continue to bear the burden of growth in the near future.

1989 Population:	.26 million (Urban—.12, Rural—.14)
Annual Population Growth:	.62% (Urban—1.79%, Rural—-.28%)
Infant Mortality:	11
Child Mortality:	0
Incidence of Mortalities due to Diarrheal/Intestinal Diseases per 1,000 deaths:	N/A
Life Expectancy:	75
Adult Literacy:	N/A
GNP per Capita:	\$5,350
GNP per Capita Annual Growth (1965-87):	2.4%
Currency:	2.01 dollars = US\$1

The health problems faced by the country have less to do with the lack of access to private health care facilities and the high prevalence of water-related illnesses found in many developing countries than with diseases problematic in more developed countries—namely, diabetes, hypertension, and cancer. PAHO reports, however, that dengue fever may be a potential threat, though potable water is available to the entire population and sewerage systems are being extended to serve populations currently not using on-site sanitation facilities. Wastewater disposal, however, remains a problem, one which the government and international donors are working to alleviate.

The country has two agencies which are responsible for water and sanitation activities: the Bridgetown Water Authority and the Land and Water Use Unit of the Ministry of Agriculture.

INVESTMENT AND COVERAGE LEVELS

Current Projects

Barbados does not currently have any water and sanitation projects funded by external support agencies. CIDA, the IDB, and A.I.D. have worked in these sectors in recent years.

CIDA

Though CIDA does not currently finance any water and sanitation projects in Barbados, it financed for several years, until 1987, a three-phase Water Resource Development Project, which included the provision of technical assistance in preparing plans for sewerage systems, to assist the Government of Barbados (GOB) in preparing requests for project financing from the IDB.

Total Committed Funding to Increase Coverage (1990-1995): \$0

IDB

The IDB has, in previous years, been active in water and sanitation development in Barbados. Begun in the mid-1970s and completed in 1984, the Central Bridgetown Water and Sanitation Project involved the construction of new sewers, a treatment plant, a pumping station, and an outfall to the sea. Under this \$12.3 million project, additional sewerage and water supply connections were made, though mostly to commercial sites. The IDB is now waiting for the GOB to make additional connections to residential sites before it will proceed with new loans.

The IDB currently has one additional loan awaiting approval—the South Coast Sewerage System Project. The IDB is conducting feasibility studies for this four-year project but cannot approve it until the contractual obligations set forth in the Bridgetown loan are met. Under the South Coast Sewerage loan, sewerage lines will be extended and improved to serve urban residents along the south coast.

Total Committed Funding to Increase Coverage (1990-1995): \$0

A.I.D.

A.I.D. does not currently fund any water and sanitation projects in the country.

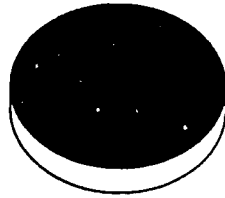
Total Committed Funding to Increase Coverage (1990-1995): \$0

Water and Sanitation Coverage (1985-1989)

Population figures were obtained from the U.S. Bureau of the Census. The urban sector of Barbados comprises the population of Bridgetown. All other areas were considered rural.

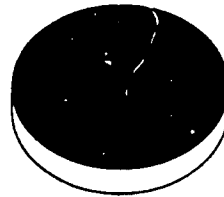
As shown in Tables and Figures A-1 and A-2, Barbados has benefited from essentially full coverage in potable water and basic sanitation from 1985 to the present (also see charts below). Infrastructure development efforts in the country in recent years have focused less on the construction of low-quality services, such as pit latrines and community standpipes, and more on the upgrading and extension of higher quality systems to a greater proportion of the population, in addition to supporting an expanding tourism industry.

1989 ACCESS TO WATER



WITH
100%

1989 ACCESS TO SANITATION



WITH
100%

MEETING THE 1995 TARGETS

Though the country's rural population is projected to decline from 1989 to 1995, population projections show that the urban population will increase by 15,000 persons during this period (Figures A-3 and A-4). To meet this increase and maintain Barbados's current full coverage levels in water and sanitation, approximately \$2 million in both water and sanitation will be needed (Table A-3 and Figure A-5). The IDB, which is currently evaluating a sanitation loan to the GOB, should be able to provide sufficient funds to meet the urban sanitation target, though this funding has not yet been committed. No immediate external donor assistance is anticipated for the urban water sector. Overall, Barbados has an estimated funding shortfall of \$3.8 million.

TABLE A - 1
 BARBADOS

 ACTUAL WATER SUPPLY
 COVERAGE VERSUS 1995 TARGETS

YEAR	WATER SUPPLY								
	TOTAL POP-ULATION	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% SERVED	URBAN POP.	TOTAL SERVED	% SERVED	RURAL POP.	TOTAL SERVED	% SERVED
1985	253	252	100 %	107	107	100 %	146	145	99 %
1989	259	259	100 %	115	115	100 %	144	144	100 %
TARGETS FOR 1995	272	272	100 %	130	130	100 %	142	142	100 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

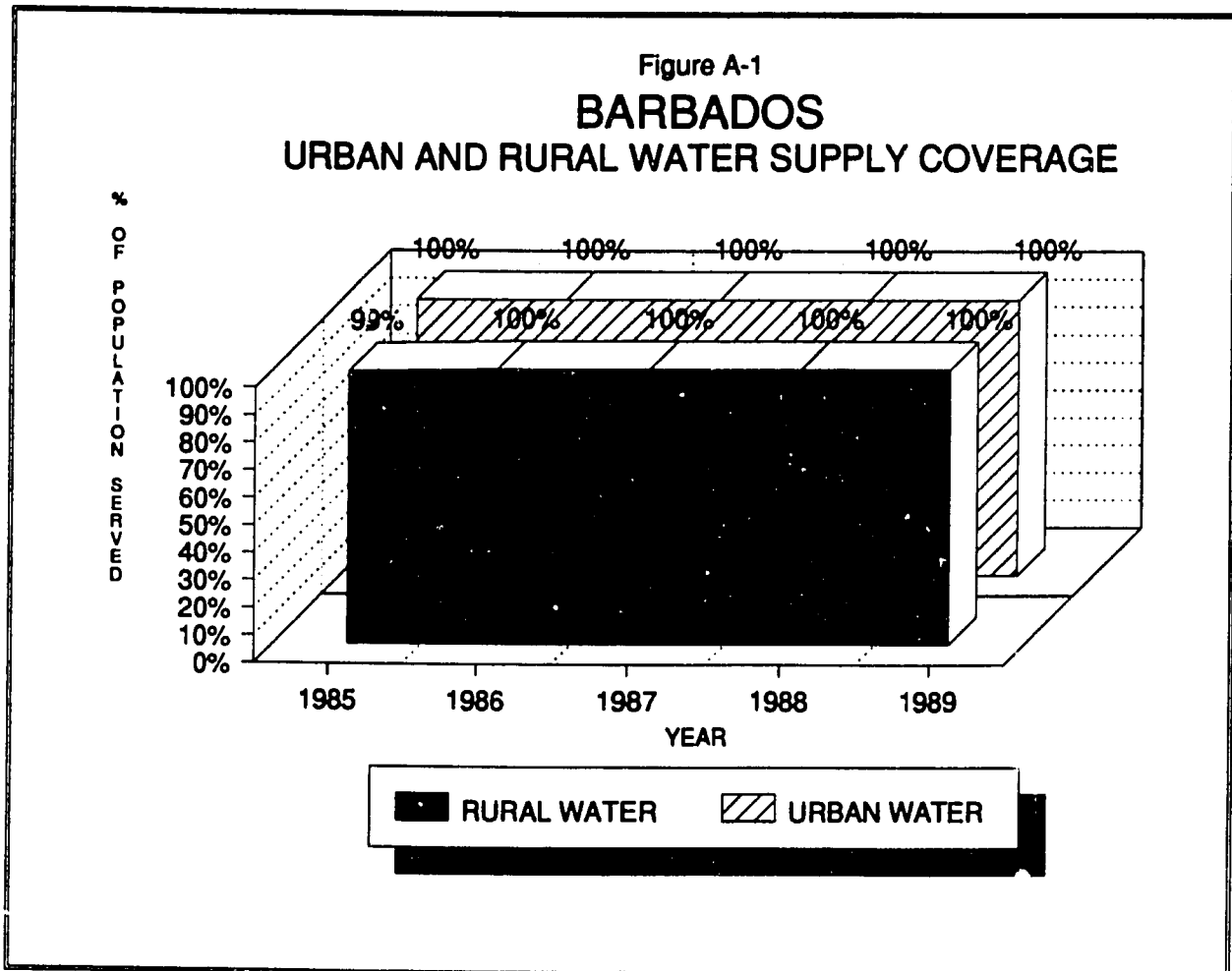


TABLE A - 2
BARBADOS

**ACTUAL SANITATION
 COVERAGE VERSUS 1995 TARGETS**

YEAR	TOTAL POP-ULATION	SUB-CAPTION							
		ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% SERVED	URBAN POP.	TOTAL SERVED	% SERVED	RURAL POP.	TOTAL SERVED	% SERVED
1985	253	253	100 %	107	107	100 %	146	146	100 %
1989	259	259	100 %	115	115	100 %	144	144	100 %
1995 TARGET	272	272	100 %	130	130	100 %	142	142	100 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

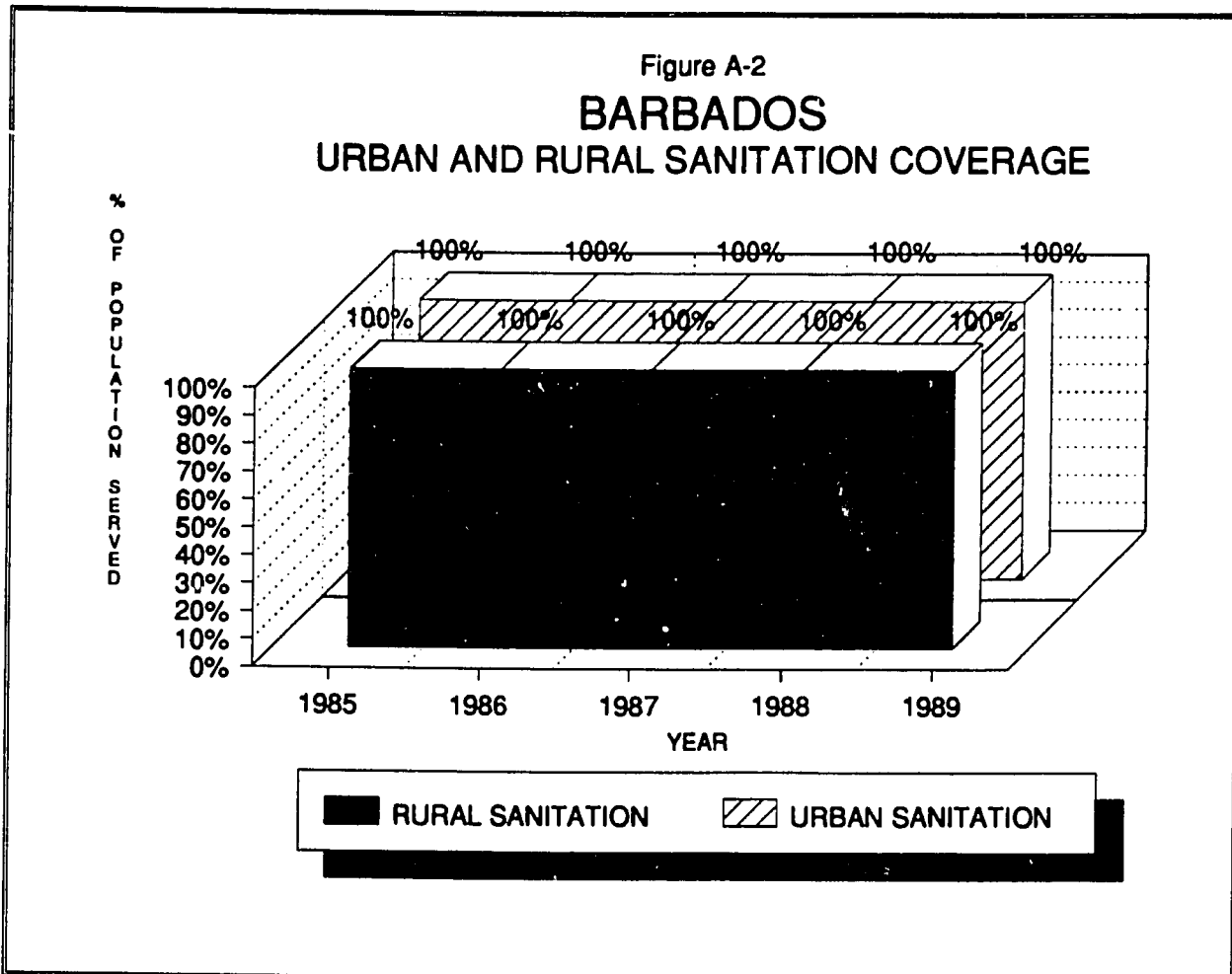
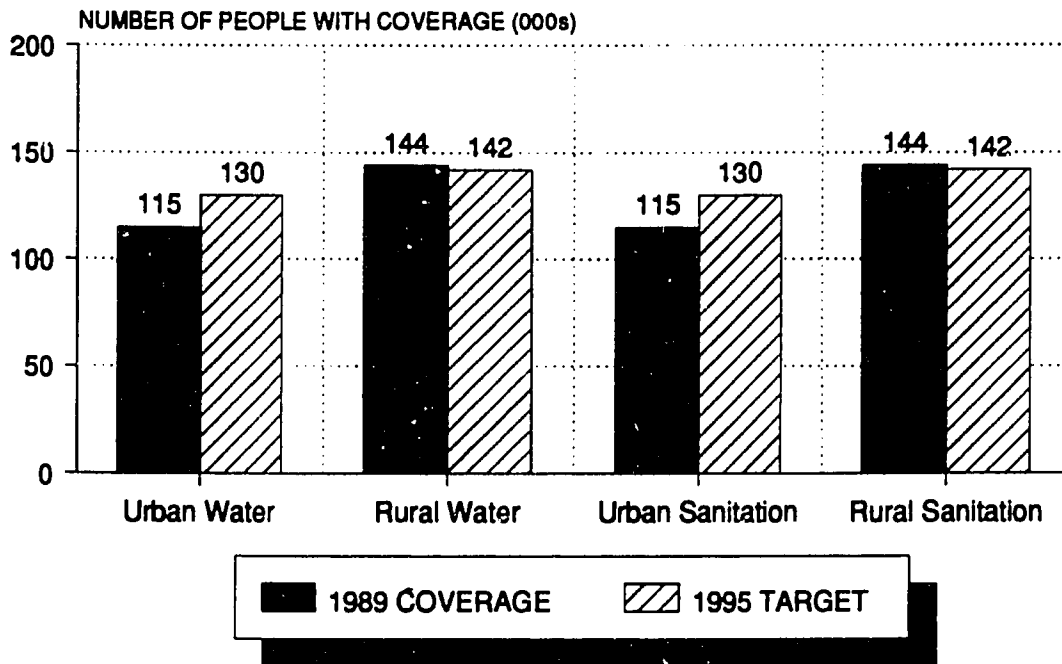


Figure A-3
BARBADOS
 1989 COV. & 1995 TARGETS (# OF PEOPLE)



Rural population is projected to decline from 1989-1995.

Figure A-4
BARBADOS
 1989 COVERAGE & 1995 TARGETS (% OF POP.)

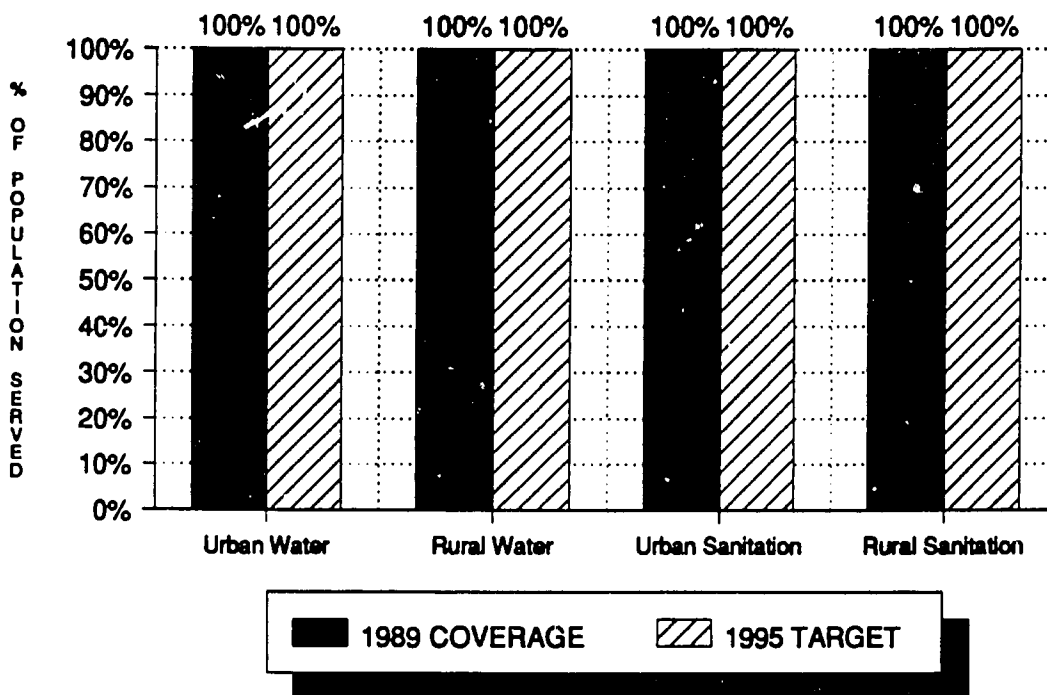


TABLE A - 3
BARBADOS

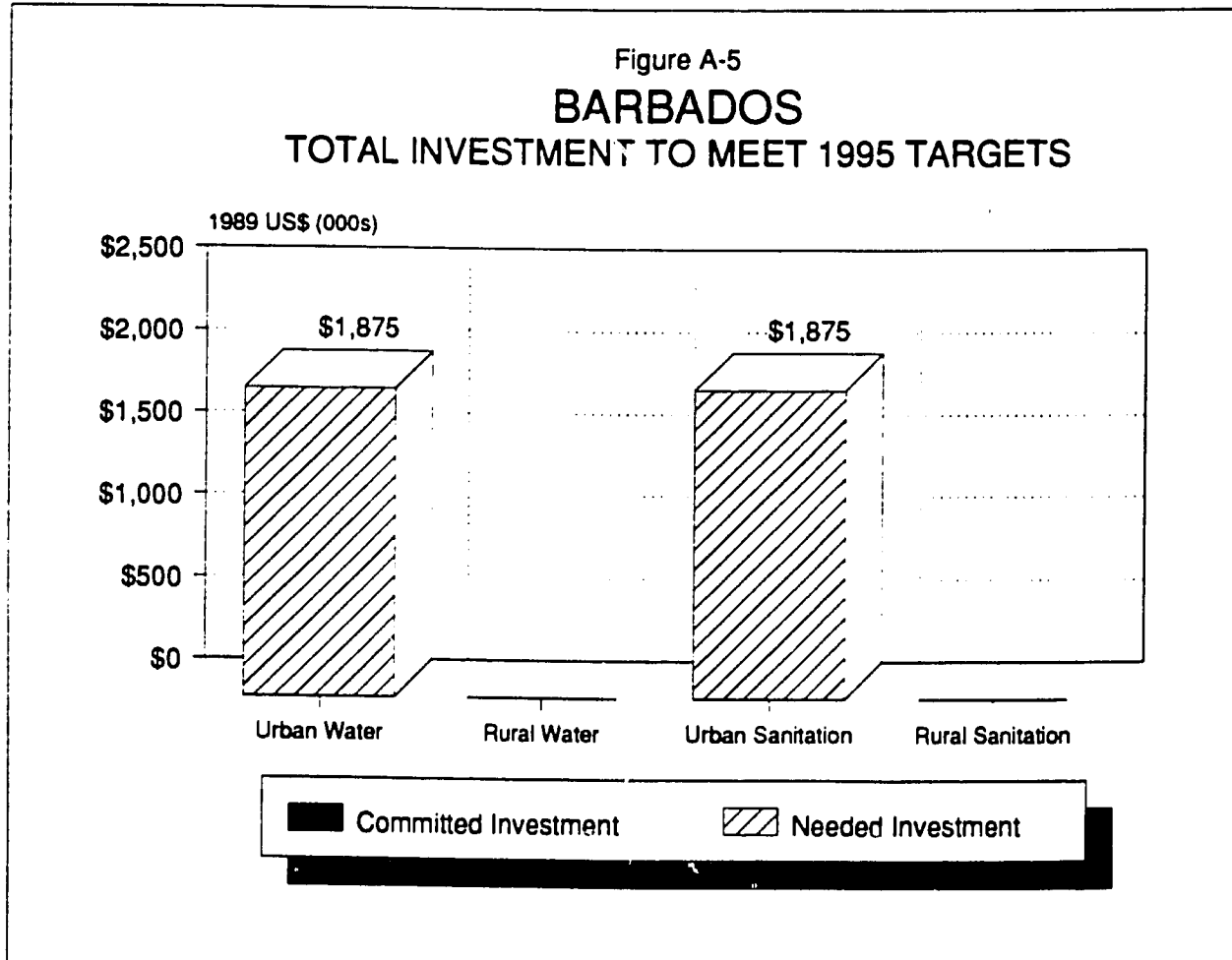
INVESTMENT NEEDED TO MEET
THE 1995 TARGETS

	WATER SUPPLY COVERAGE (PERSONS - 000s)			SANITATION COVERAGE (PERSONS - 000s)		
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL
TARGET FOR 1995 (000s)	272	130	142	272	130	142
COVERAGE IN 1989	259	115	144	259	115	144
REQUIRED INCREASE	13	15	0	13	15	0
UNIT COST PER CAPITA (\$)	N/A	\$125	\$125	N/A	\$125	\$100
ESTIMATED TOTAL COST TO MEET 1995 TARGET (\$000s)	\$1,875	\$1,875	\$0	\$1,875	\$1,875	\$0
COMMITTED FUNDS * (\$000s)	\$0	\$0	\$0	\$0	\$0	\$0
PROJECTED FUNDING SHORTFALL (\$000s)	\$1,875	\$1,875	\$0	\$1,875	\$1,875	\$0

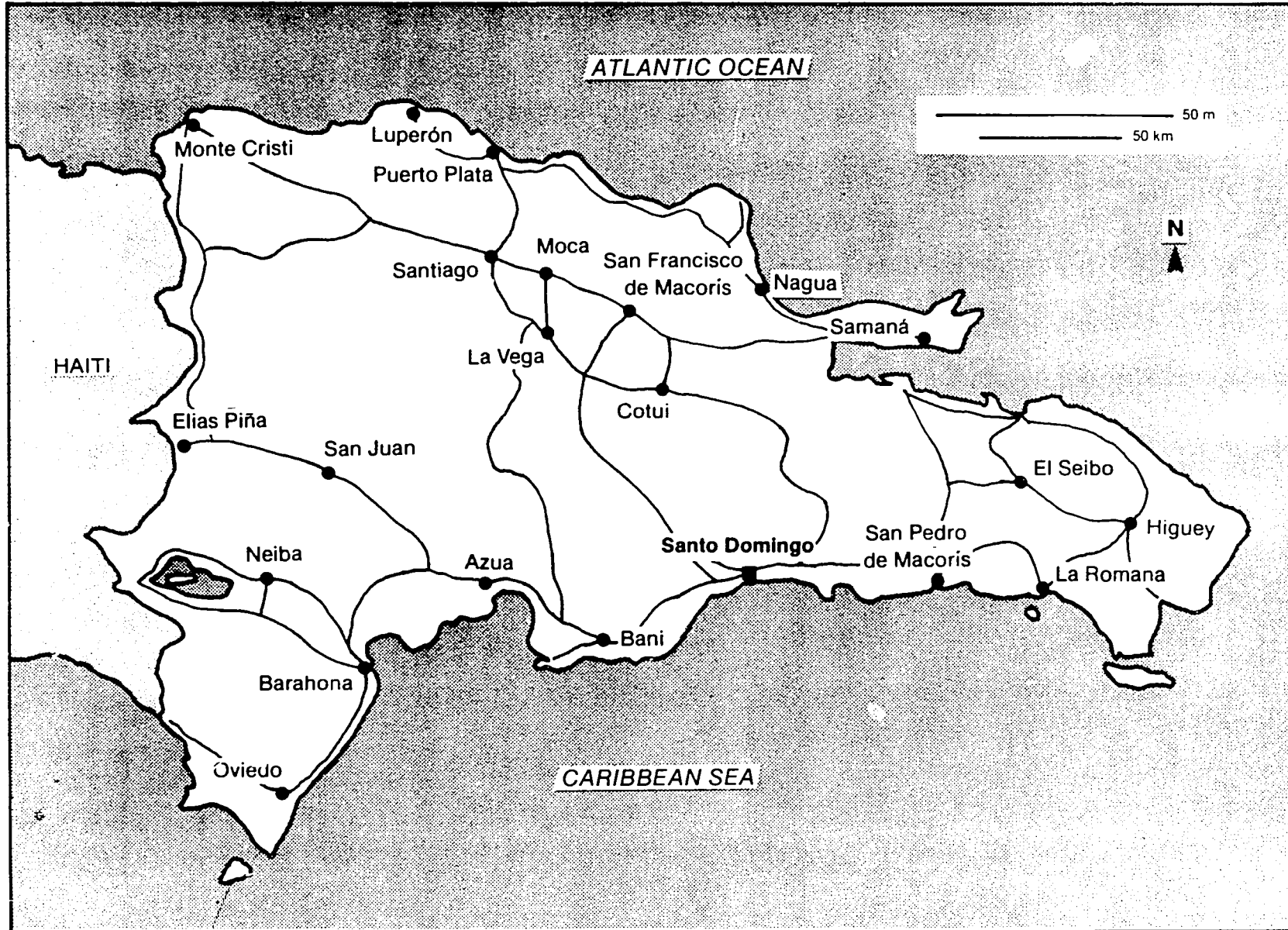
TOTAL FUNDING SHORTFALL:

\$3,750

* ONLY THOSE FIRMLY COMMITTED INVESTMENTS WHICH INCREASE COVERAGE



DOMINICAN REPUBLIC



Appendix B

Country Profile: DOMINICAN REPUBLIC

COUNTRY BACKGROUND

On the island of Hispaniola, which it shares with Haiti, the Dominican Republic covers over 48,000 square kilometers. While the country's economy grew rapidly from 1966 to 1980, averaging 7 percent a year during this period, declining markets for the country's traditional exports and deteriorating external terms of trade have led to large swings in the economy and a growing national debt.

Though the infant mortality rate has decreased in the past few decades and the average life expectancy has increased, health conditions in the country remain problematic. PAHO reports that diarrhea is the leading identified cause of death among infants under one year of age. Future health sector strategies in the country include the reorganization of the national health system to achieve universal coverage, strengthening the maternal and child health program and restructuring the administration of health services to make better use of resources.

In the water and sanitation sector, the national water and sewerage institute (*Instituto Nacional de Agua Potable y Alcantarillado—INAPA*) is, by statute, the leader in water and sanitation development and is responsible for the coordination of all national activities in the sector, including advisory and policy functions. Other agencies working in the sector include the Santo Domingo Water and Sewerage Corporation (*Corporación de Acueductos y Alcantarillados de Santo Domingo—CAASD*), the Santiago Water and Sewerage Corporation (*Corporación de Acueductos y Alcantarillados de Santiago—CORAASAN*), and a unit of the Ministry of Public Health, *Secretaría de Estado de Salud Pública y Asistencia Social (SESPAS)*.

1989 Population:	7.0 million (Urban—4.1, Rural—2.9)
Annual Population Growth:	2.22% (Urban—3.64%, Rural—0.31%)
Infant Mortality:	63
Child Mortality:	18
Incidence of Mortalities due to Diarrheal/Intestinal Diseases per 1,000 deaths:	28
Life Expectancy:	66 (Male—64, Female—68)
Adult Literacy:	Male—78%, Female—77%
GNP per Capita:	\$730
GNP per Capita Annual Growth (1965-87):	2.3%
Currency:	8.43 pesos = US\$1
Average Annual Inflation (1980-87):	16.3%

INVESTMENT AND COVERAGE LEVELS

Current Projects

A number of donors are working in the Dominican Republic to expand water and sanitation coverage in the country. In addition to these ongoing efforts, the IDB is preparing a large loan proposal to rehabilitate and expand water and sewerage systems in intermediate-sized cities throughout the country.

A.I.D.

USAID/DR currently supports four projects with water and sanitation components. A.I.D.'s PVO Co-Financing Project, which began in 1989 and is scheduled for completion in mid-1996, will finance subgrants to various PVOs to carry out water and sanitation activities throughout the country. Of the total \$13.5 million for the project, approximately \$800,000 will be used to support water and sanitation activities, and an estimated 65,000 people will benefit from these grants over the life of the project.

Under the SESPAS Water Supply and Sanitation Project, A.I.D. is using nearly \$300,000 in local currency to finance the installation of handpumps and gravity flow water systems and the construction of latrines in small rural communities. SESPAS, an entity of the Ministry of Public Health, has implemented this project; over the life of the project, which began in mid-1987 and is scheduled for completion in August 1990, 137,000 rural residents will benefit from improved water and sanitation facilities.

On a smaller scale, A.I.D. has supported a program to improve sanitation conditions in the barrios of Santo Domingo, with \$36,000 in local currency. Begun in 1986, this project was completed at the end of 1989 and is benefiting 30,515 persons by providing home improvement loans to slum dwellers to upgrade their household water and sanitation conditions.

A.I.D. is also funding, with \$916,000 of local currency, the construction of the Itabo Free Trade Zone Aqueduct. The work on this project began in 1987 and should be completed by the end of 1990, to the benefit of 20,000 urban and peri-urban dwellers.

Total Committed Funding to Increase Coverage (1990-1995): \$1,000,000

Government of Italy

Italy currently supports two large water supply projects in the Dominican Republic, one to serve Valdesia and Santo Domingo and the other in the province of Santiago. The Valdesia-Santo Domingo project will enhance the availability of water to the approximately 1.8 million residents of the capital of Santo Domingo. Implemented by CAASD, the first phase of the project has been under way since 1987 and the project is scheduled for completion in 1992. Italian investment in this project totals \$75 million.

Dominican Republic-2

Construction on the Santiago water system, which will serve the towns of Santiago, Moca, Licy, and Tamboril, began in 1990 and should be completed by 1992. The project is projected to improve the water supply to the 600,000 residents of these areas and will be implemented by CORAASAN. Financing for this effort totals \$50 million.

For the purposes of this report, just 10 percent of the undisbursed portion of these investments has been considered as increasing water supply coverage.

Total Committed Funding to Increase Coverage (1990-1995): \$8,500,000

Government of the Dominican Republic (GODR)

The GODR supports a water supply program to build 15 water supply systems in cities throughout the country. Implemented by INAPA, the national water and sanitation agency, work on the \$16 million project began in 1989 and is scheduled for completion in 1990. The goal of this project is to improve the availability of potable water to serve approximately 1 million people.

Total Committed Funding to Increase Coverage (1990-1995): \$8,000,000

CARE

In August 1989, CARE completed a four-year A.I.D.-funded rural water supply program that is providing potable water to some 37,000 beneficiaries through the installation of handpumps and gravity flow systems. CARE has begun a follow-on program to provide 3,000 rural Dominicans with potable water with \$32,000 from CARE and \$142,000 through a grant from the Arab gulf states via the UNDP. This program, which began in September 1989, will be completed in August 1990 unless CARE is able to identify additional funding sources to continue its water and sanitation activities beyond that date.

Total Committed Funding to Increase Coverage (1990-1995): \$174,000

Servicios Sociales de Iglesias Dominicanas (SSID)

SSID, a local PVO, has an ongoing water supply and sanitation program in rural communities throughout the Dominican Republic. In 1988, SSID provided water and/or sanitation facilities through the installation of wells, cisterns, latrines, and a water supply system for 4,033 beneficiaries, at a cost of \$27,000. It is projected that SSID will sustain this level of investment in years to come.

Total Committed Funding to Increase Coverage (1990-1995): \$54,000

IDB

The IDB currently has no active loans in the water and sanitation sector at this time, though the Bank recently completed its PLANAR Project, the first phase of which began in 1968. Under the third and final phase of this project, which began in 1982 and ended in 1989, the IDB jointly financed with the GODR the construction of potable water systems in 55 small towns with between 400 and 5,000 inhabitants. In addition, this rural water project financed macro water meters for 15 cities and meters for 85,000 households. Financing for this phase of the project totaled \$6.3 million, \$2.7 million of that from the GODR.

The IDB is currently in the process of developing another water and sanitation loan to support the construction and expansion of potable water and sanitation systems for intermediate-sized cities in the Dominican Republic. This loan could begin as soon as 1992 and provide \$50 million worth of financing, though further details are not available and approval for the loan is not imminent.

Total Committed Funding to Increase Coverage (1990-1995): \$0

World Bank

The World Bank prepared a \$35 million water supply loan proposal, but the GODR was not interested in the terms of the arrangement. It does not appear that this project will be approved in the near future.

Total Committed Funding to Increase Coverage (1990-1995): \$0

Water and Sanitation Coverage (1985-1989)

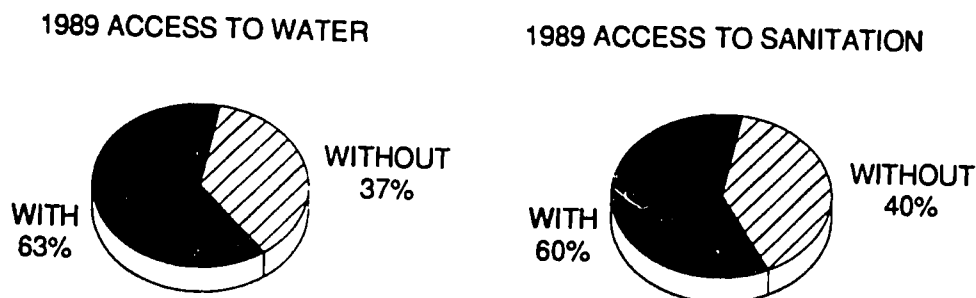
Population figures were obtained from USAID/DR's Family Planning Services Expansion Project and the Population and Employment Division of the National Office of Planning. Coverage information for 1985 was obtained from INAPA; 1989 figures were extrapolated from INAPA's 1988 coverage data.

Current water and sanitation coverage levels vary greatly between the Dominican Republic's urban and rural populations. While the urban water coverage level in 1989 was 89 percent, potable water was available for only 27 percent of the rural population. Access to adequate sanitation facilities was only slightly closer—79 percent of the urban population served and 34 percent of the rural population.

In the urban sector, the Dominican Republic has seen significant growth in both water and sanitation coverage levels from 1985 to 1989. As seen in Table and Figure B-1, urban water coverage increased from 68 percent in 1985 to 89 percent in 1989, an additional 1.3 million persons with access to potable water. Urban sanitation levels increased as well, though at a slower rate, rising from 66 percent in 1985 to 79 percent in 1989, an increase of nearly 890,000 persons (Table and Figure B-2).

In the rural sector, however, progress was minimal in the provision of potable water and nonexistent in the expansion of sanitation facilities. While rural water coverage increased by 64,000 persons, a two-point increase to 27 percent, rural sanitation fell severely—from 61 percent in 1985 to 34 percent in 1989. The substantial decline in the number of rural residents with access to basic sanitation in 1989, 772,000 fewer than in 1985, is not easily explained. Nonetheless, it appears to be a revised estimate by INAPA, correcting the relatively high rate of coverage reported in 1985.

The charts below show the Dominican Republic's 1989 coverage rates for the total population.



MEETING THE TARGETS

1995 Targets

The 1995 targets are set to increase coverage substantially in all subsectors. As discussed in Chapter 2, these targets were not developed with Dominican participation and are simply intended for use as planning tools to gauge the progress that is being made in expanding water and sanitation services in the Dominican Republic. The rate of coverage expansion called for by each 1995 target is relative to the level of current coverage and is set to attain full coverage in water and sanitation in 30 years, by 2020.

As seen in Figures B-3 and B-4 and Table B-3, the targets call for an increase in urban water coverage from the current rate of 89 percent to 93 percent in 1995, an increase of nearly 1.1 million persons. The 1995 urban sanitation target is also set to increase coverage to an additional 1.1 million persons, raising the current coverage level of 79 percent by six percentage points to 85 percent of the urban population with access to sanitation facilities.

Among the rural population of the country, the 1995 targets are set to increase coverage by larger percentages, though with the country's low rural population growth rate, these targets do not require as many additional persons to be served as the urban targets. In the rural water supply subsector, the 1995 target is set to raise coverage by 16 percentage points to 43 percent, an increase of nearly 500,000 persons. The rural sanitation target is set at 48 percent, which requires that an additional 440,000 persons gain access, at a minimum, to basic sanitation facilities.

Meeting the 1995 Urban Water and Sanitation Targets

To meet the 1995 urban water and sanitation targets, substantial levels of investment will be needed over the next six years (Table B-3 and Figure B-5). In the urban water subsector, an estimated \$109 million will be required. The level of investment needed to meet the 1995 urban sanitation target is slightly larger, \$116 million. At this time, the Italian government is supporting the extension of services to persons currently unserved by any satisfactory water system, and an IDB loan being developed will help to cover at least a portion of these investment shortfalls. These two projects, however, will not be able to provide for the expansion of water and sanitation coverage needed to meet the 1995 urban targets.

Meeting the 1995 Rural Water and Sanitation Targets

The funding needed to meet the 1995 rural water and sanitation targets is much smaller than the shortfall for the urban sector. This marked difference is due to two factors: the increase in the number of persons with service is less than half of that for the urban sector, and the per capita unit cost for rural water and sanitation facilities is less than a third of that for urban systems. Despite the lower costs of constructing rural water and sanitation systems and the need for these services, as evidenced by low coverage rates, shortfalls in funding to meet the 1995 targets persist. Of the \$34 million needed for rural water system construction, just \$9 million has been committed to this effort. In the rural sanitation sector, however, only \$350,000 has been committed to increase coverage, leaving a funding shortfall of nearly \$13 million.

TABLE B - 1
 DOMINICAN REPUBLIC

 ACTUAL WATER SUPPLY
 COVERAGE VERSUS 1995 TARGETS

YEAR	WATER SUPPLY								
	TOTAL POP-ULATION	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% SERVED	URBAN POP.	TOTAL SERVED	% SERVED	RURAL POP.	TOTAL SERVED	% SERVED
1985	6,416	3,097	48 %	3,496	2,363	68 %	2,918	734	25 %
1989	7,019	4,416	63 %	4,065	3,618	89 %	2,954	798	27 %
TARGETS FOR 1995	8,045	5,977	74 %	5,036	4,683	93 %	3,009	1,294	43 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

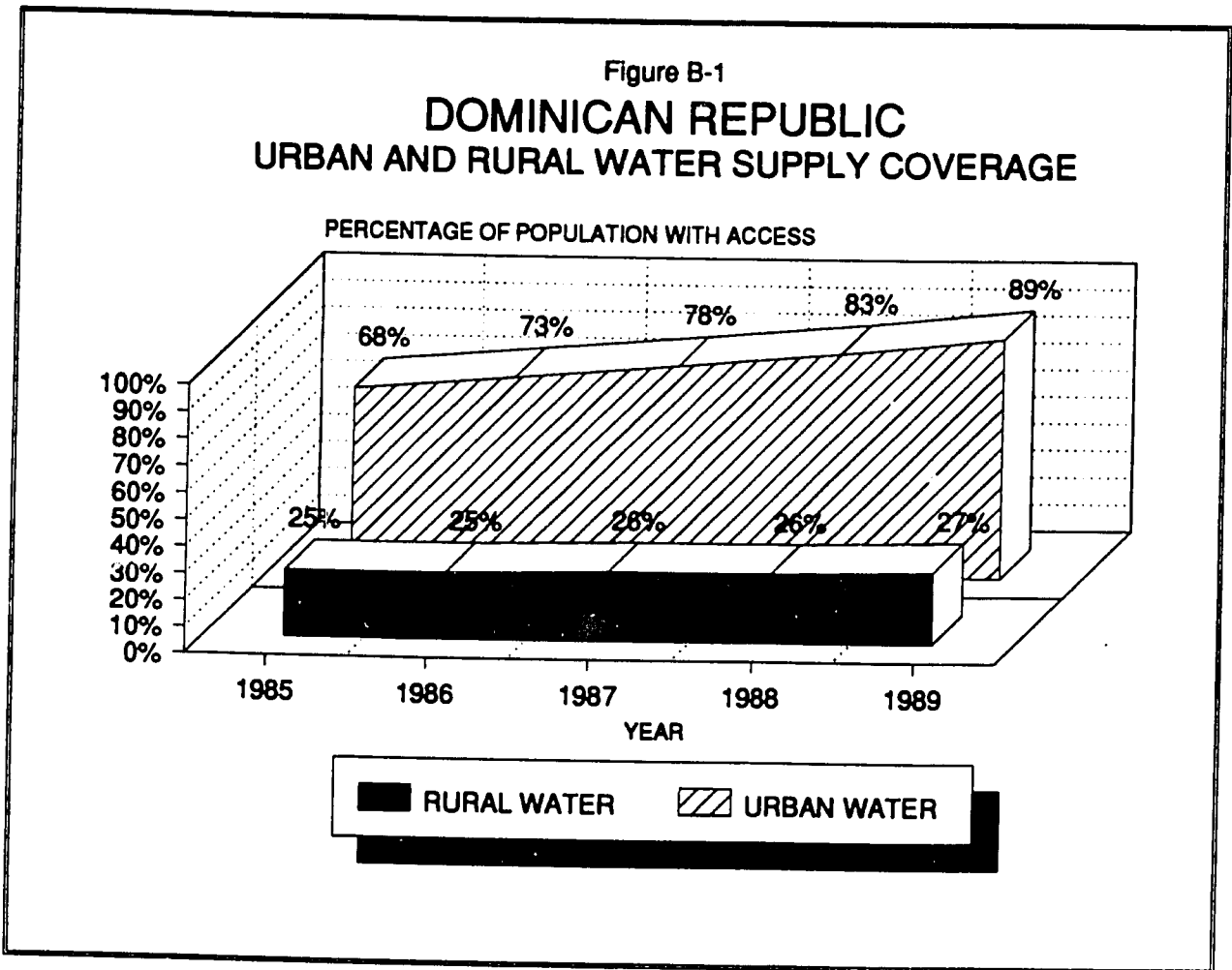


TABLE B - 2
 DOMINICAN REPUBLIC

 ACTUAL SANITATION
 COVERAGE VERSUS 1995 TARGETS

YEAR	SANITATION								
	TOTAL POP-ULATION	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% SERVED	URBAN POP.	TOTAL SERVED	% SERVED	RURAL POP.	TOTAL SERVED	% SERVED
1985	6,416	4,101	64 %	3,490	2,325	66 %	2,918	1,776	61 %
1989	7,019	4,215	60 %	4,065	3,211	79 %	2,954	1,004	34 %
1995 TARGET	8,045	5,725	71 %	5,036	4,281	85 %	3,009	1,444	48 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

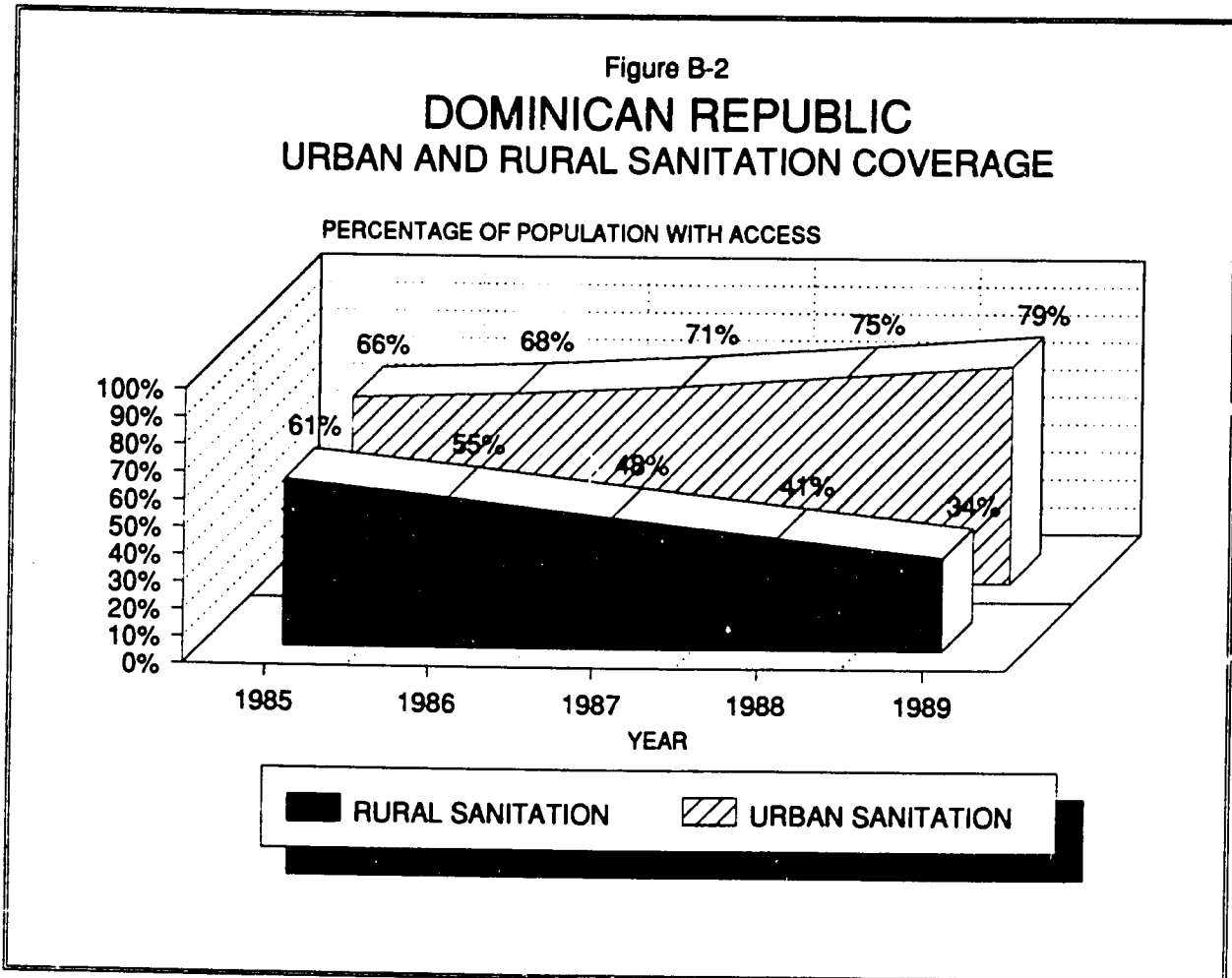


Figure B-3
DOMINICAN REPUBLIC
 1989 COV. & 1995 TARGETS (# OF PEOPLE)

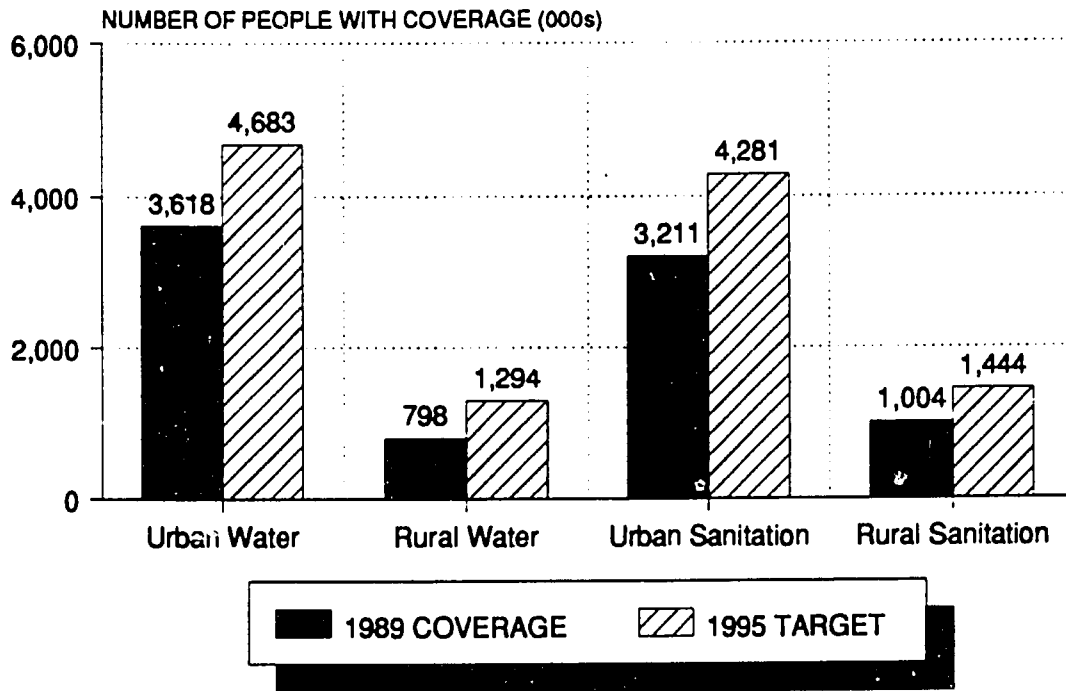


Figure B-4
DOMINICAN REPUBLIC
 1989 COVERAGE & 1995 TARGETS (% OF POP.)

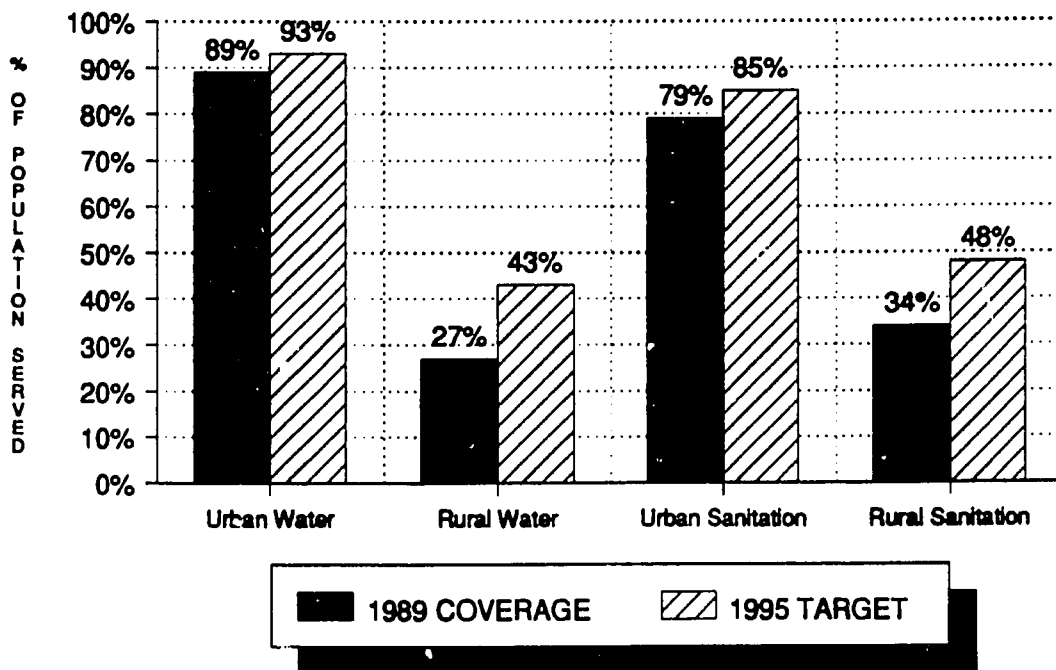


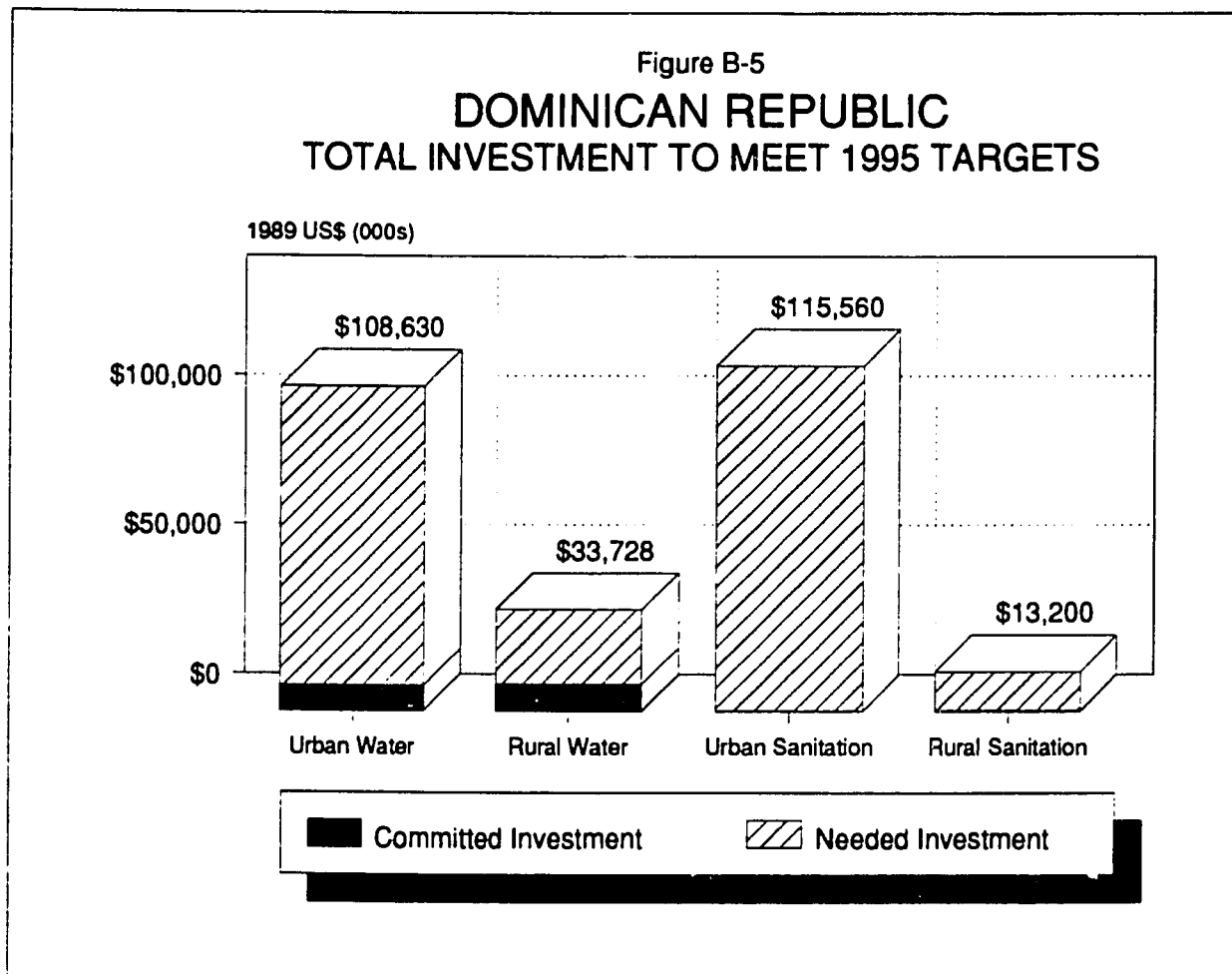
TABLE B - 3
DOMINICAN REPUBLIC

INVESTMENT NEEDED TO MEET
THE 1995 TARGETS

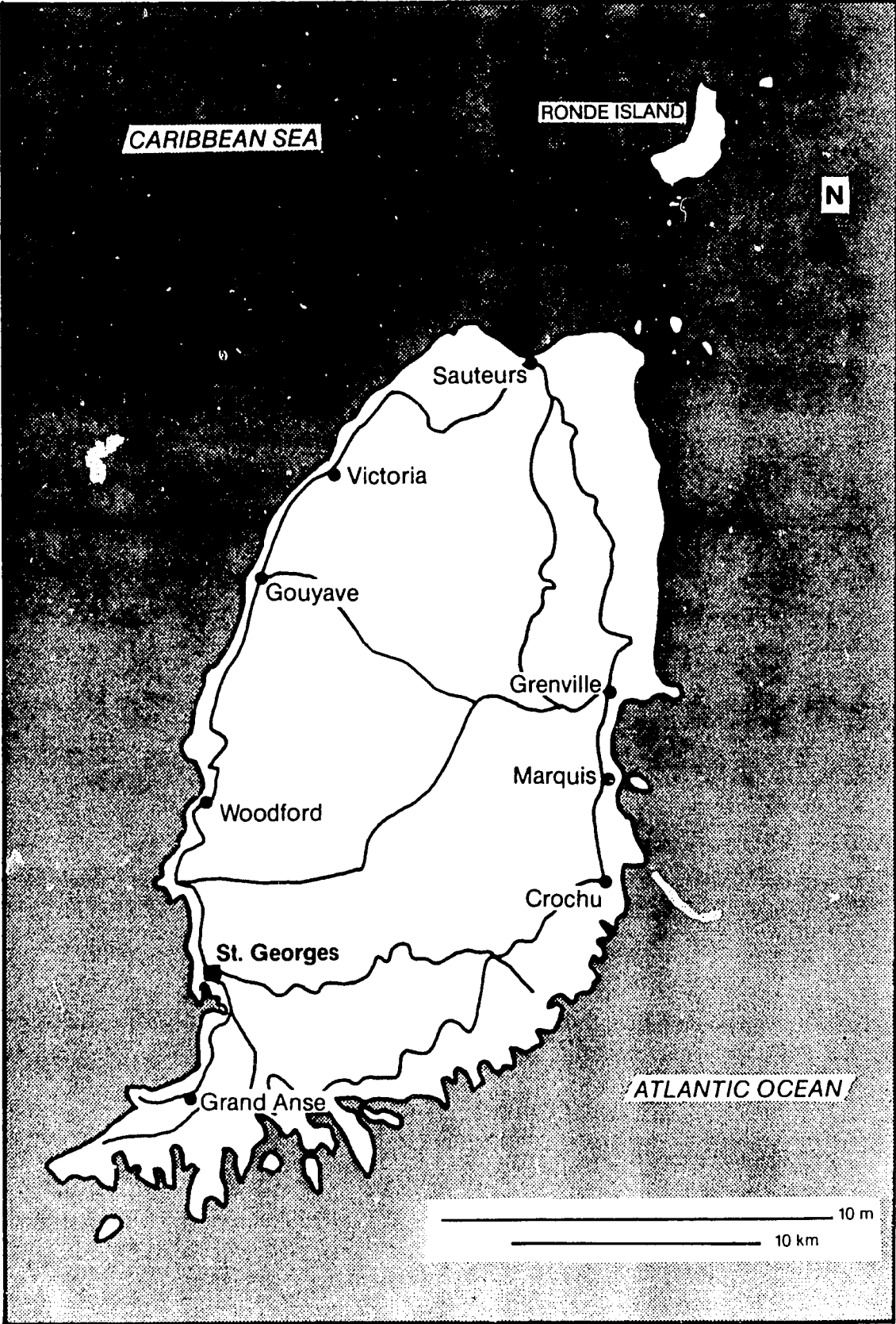
	WATER SUPPLY COVERAGE (PERSONS - 000s)			SANITATION COVERAGE (PERSONS - 000s)		
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL
TARGET FOR 1995 (000s)	5,977	4,683	1,294	5,725	4,281	1,444
COVERAGE IN 1989	4,416	3,618	798	4,215	3,211	1,004
REQUIRED INCREASE	1,561	1,065	496	1,510	1,070	440
UNIT COST PER CAPITA (\$)	N/A	\$102	\$68	N/A	\$108	\$30
ESTIMATED TOTAL COST TO MEET 1995 TARGET (\$000s)	\$142,358	\$108,630	\$33,728	\$128,760	\$115,560	\$13,200
COMMITTED FUNDS * (\$000s)	\$17,395	\$8,500	\$8,895	\$333	\$0	\$333
PROJECTED FUNDING SHORTFALL (\$000s)	\$124,963	\$100,130	\$24,833	\$128,427	\$115,560	\$12,867

TOTAL FUNDING SHORTFALL: \$253,390

* ONLY THOSE FIRMLY COMMITTED INVESTMENTS WHICH INCREASE COVERAGE



GRENADA



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Appendix C

Country Profile: GRENADA

COUNTRY BACKGROUND

Grenada, the least populous of the Caribbean nations under study and one of the Windward Islands, covers 344 square kilometers. The economy of the country is largely based upon the agricultural, manufacturing, and tourism industries. Due in part to sizable investments by A.I.D. in infrastructure development, policy reform, and budgetary support, Grenada's GNP has grown in recent years at a rate of over 6 percent annually. The country has long been dependent upon foreign aid, from the Eastern Bloc and especially Cuba until 1983, the time of the U.S. intervention, and since that time by the United States and other donors.

1989 Population:	86,000
Annual Population Growth:	-.27%
Infant Mortality:	21
Child Mortality:	7
Incidence of Mortalities due to Diarrheal/Intestinal Diseases per 1,000 deaths:	N/A
Life Expectancy:	69
Adult Literacy:	N/A
GNP per Capita:	\$1,340
GNP per Capita Annual Growth (1965-87):	6%
Currency:	2.70 E. Caribbean dollar = US\$1
Average Annual Inflation (1980-87):	4.9%

Health strategies in the country focus upon improving the quality of primary health care services in addition to examining health care financing options to reduce the cost of delivering health services. No information on the incidence of diarrhea and other water-related diseases was available, though the reduction of the dengue vector in water supplies is recognized as an important goal for the country.

National agencies working in the water and sanitation sector include the Central Water Commission (CWC), which is primarily responsible for the sector, and the Ministry of Communications and Works.

INVESTMENT AND COVERAGE LEVELS

Current Projects

A.I.D.

A.I.D. has, in recent years, worked to improve Grenada's water and sanitation sector through a number of efforts, including the construction of water systems and the provision of training and technical assistance to the CWC. Currently, A.I.D. funds the Grenada Infrastructure III Project, through which A.I.D. is continuing its efforts to rehabilitate and improve basic infrastructure in the country. Water sector improvements under this project will seek to increase the supply and improve water service to tourism facilities and newly established small industries through the construction of new water wells and through improved conservation controls, such as water system renovation and increased metering. This project, which began in 1988, is scheduled to end in February 1991. Because only a portion of this \$4 million project is devoted to water improvements and since the focus is less on increasing coverage to unserved populations and more on enhancing the availability of potable water for the tourism and other industries, project funds have not been considered as increasing coverage. In addition, A.I.D. is considering the expansion of this project to include \$3 million for the construction of a sewerage system in the Grand Anse area.

Total Committed Funding to Increase Coverage (1990-1995): \$0

CIDA

While CIDA has been active in providing technical assistance in water and sanitation development to the GOG, no water and sanitation projects are currently financed by Canada. Studies for an outfall sewer for St. George's were undertaken in 1988, but construction of the system has not yet been approved. From 1988 to 1989, CIDA also provided \$250,000 to purchase well-drilling equipment for the CWC. These new wells were constructed in the southwest corner of the island and will serve primarily urban areas by increasing the availability of water during peak periods.

Currently, CIDA is considering an \$11 million water and sewerage project to assist in the implementation of a number of water and sanitation development efforts, to be defined based upon the master plan for water development under design by a UNDP consultant in Grenada. Approval for this project has not yet been finalized, and these monies have not been considered as committed.

Total Committed Funding to Increase Coverage (1990-1995): \$0

IDB

Grenada is not a member of the IDB, and thus, it does not directly receive IDB assistance, though the IDB does provide funds on a regional basis through the Caribbean Development Bank (CDB). The CDB, however, does not currently fund any water and sanitation efforts in Grenada.

Total Committed Funding to Increase Coverage (1990-1995): \$0

UNDP

A UNDP consultant is currently in the process of developing a 10-Year Water Development Plan for Grenada. The consultant is assessing total water resources and preparing an outline of designs and cost estimates for new capital investment works and renovations of existing works to strengthen the CWC, whose in-house capability is being developed.

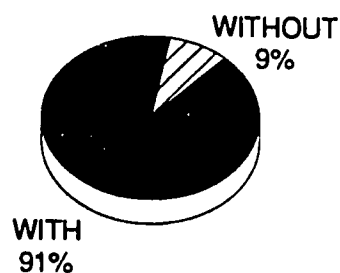
Total Committed Funding to Increase Coverage (1990-1995): \$0

Water and Sanitation Coverage (1985-1989)

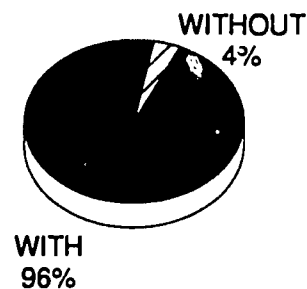
Grenada is experiencing a negative population growth rate. The population dropped from 86,000 in 1985 to 85,000 in 1989, and is projected to decline to 83,000 by 1995. During the 1985-1989 period, the number of persons with access to potable water remained static: an estimated 77,000 persons were served (91 percent). The number of persons with access to sanitation facilities increased by 3,000 to 96 percent coverage (Tables and Figures C-1 and C-2). Since population and coverage data on Grenada are available only for the country as a whole, a breakdown between urban and rural sectors was not possible.

The charts below show Grenada's current water and sanitation coverage rates.

1989 ACCESS TO WATER



1989 ACCESS TO SANITATION



MEETING THE TARGETS

1995 Targets

As seen in Figures C-3 and C-4, the 1995 targets call for an increase in water coverage, currently at 91 percent, and sanitation coverage, currently at 96 percent, to 100 percent for both sectors. With a projected population of 83,000 persons in 1995, the 1995 targets will require 6,000 additional persons with access to potable water and 1,000 additional persons with access to adequate sanitation facilities. Because of Grenada's small population, the methodology used to determine the 1995 targets for the other countries in this study was not used. Rather, it was assumed that Grenada can bring its coverage levels up to 100 percent by 1995, even though this requires percentage-point increases in excess of those shown in the 1995 target calculations (Table 3) in Chapter 2.

Meeting the 1995 Water and Sanitation Targets

To meet the 1995 targets, Grenada will require approximately \$750,000 to support the construction and expansion of water supply systems and \$125,000 for sanitation facility construction (see Table C-3 and Figure C-5). Though no funds have been committed by external donors at this time, CIDA is considering a project that will provide the necessary financing to meet these goals.

TABLE C - 1
GRENADA

ACTUAL WATER SUPPLY
COVERAGE VERSUS 1995 TARGET

WATER SUPPLY			
YEAR	TOTAL POP-ULATION	ALL AREAS	
		POP. SERVED	% SERVED
1985	86	77	90 %
1989	85	77	91 %
TARGET FOR 1995	83	83	100 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

NOTE: DATA DISTINGUISHING URBAN/RURAL AREAS WERE NOT AVAILABLE.

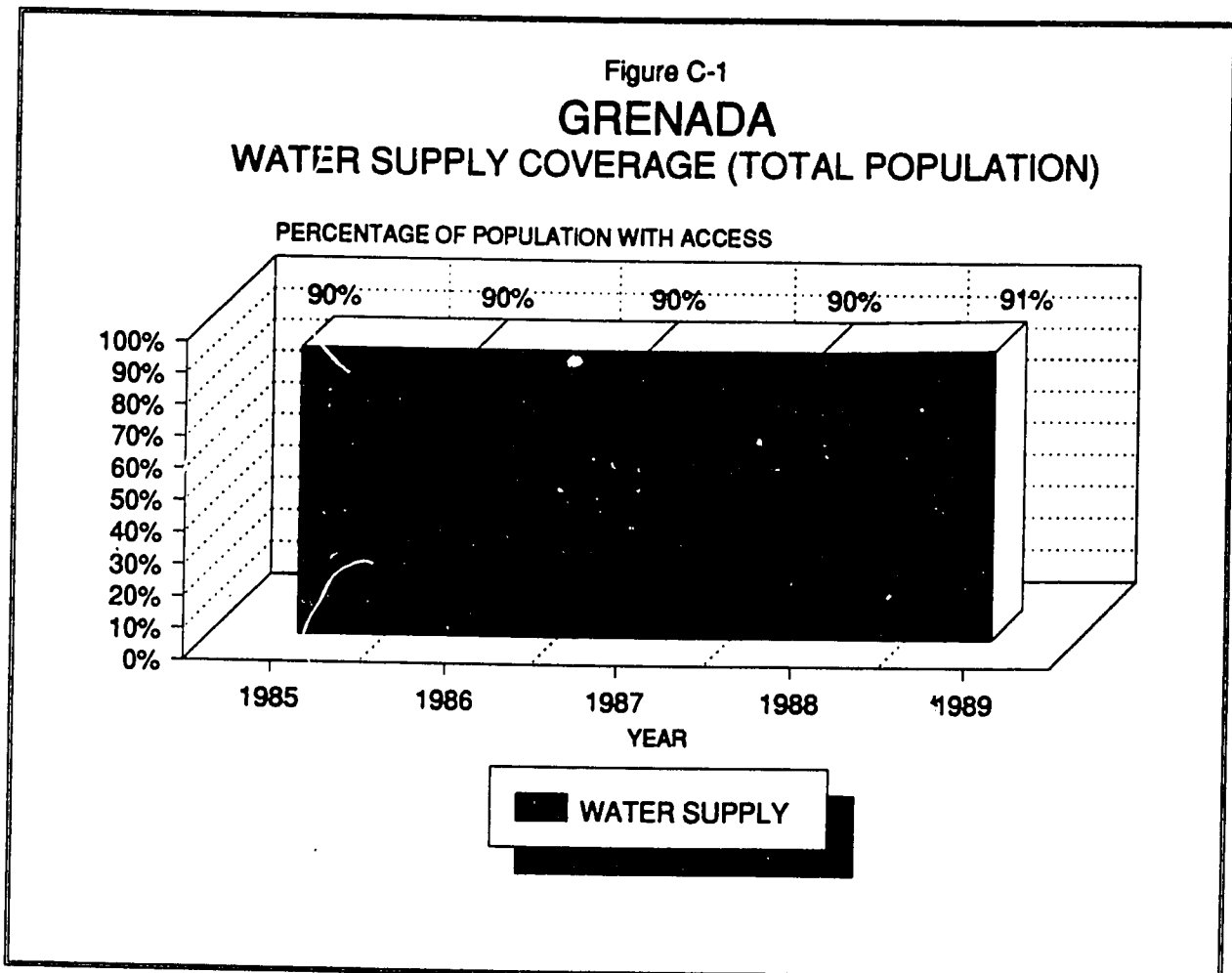


TABLE C - 2
 GRENADA

 ACTUAL SANITATION
 COVERAGE VERSUS 1995 TARGET

SANITATION			
YEAR	TOTAL POP-ULATION	ALL AREAS	
		POP. SERVED	% SERVED
1985	86	79	92 %
1989	85	82	96 %
TARGET FOR 1995	83	83	100 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

NOTE: DATA DISTINGUISHING URBAN/RURAL AREAS WERE NOT AVAILABLE.

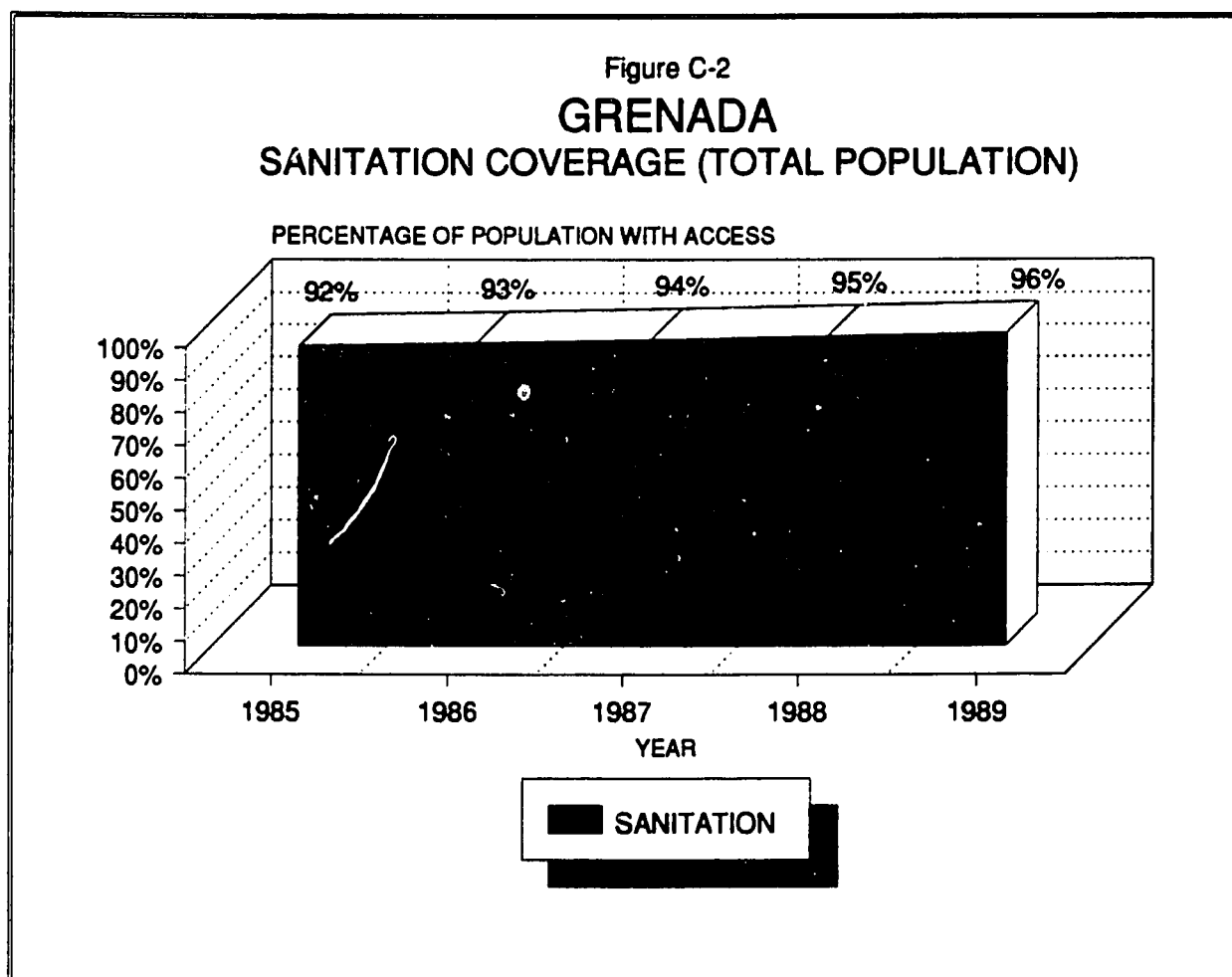


Figure C-3
GRENADA
 1989 COV. & 1995 TARGETS (# OF PEOPLE)

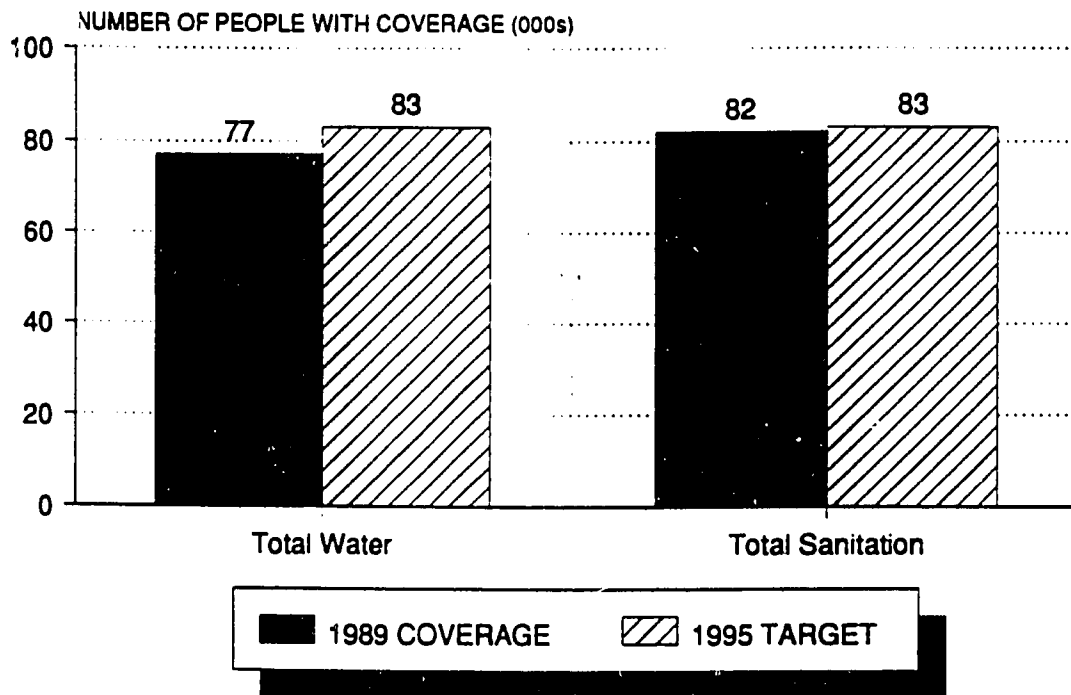


Figure C-4
GRENADA
 1989 COVERAGE & 1995 TARGETS (% OF POP.)

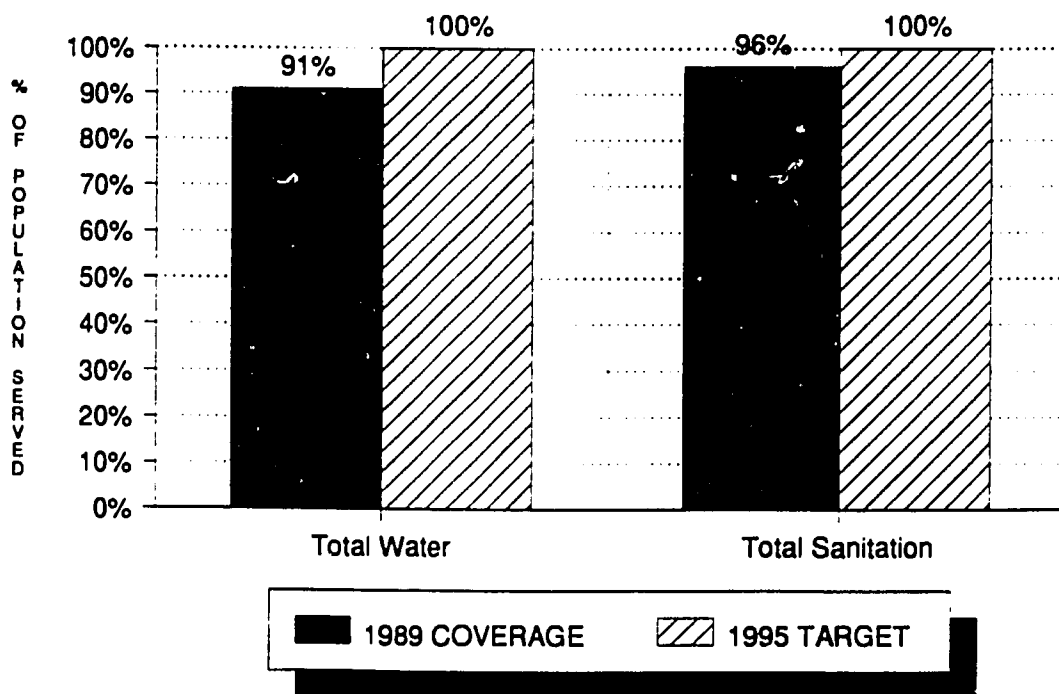


TABLE C - 3
GRENADA

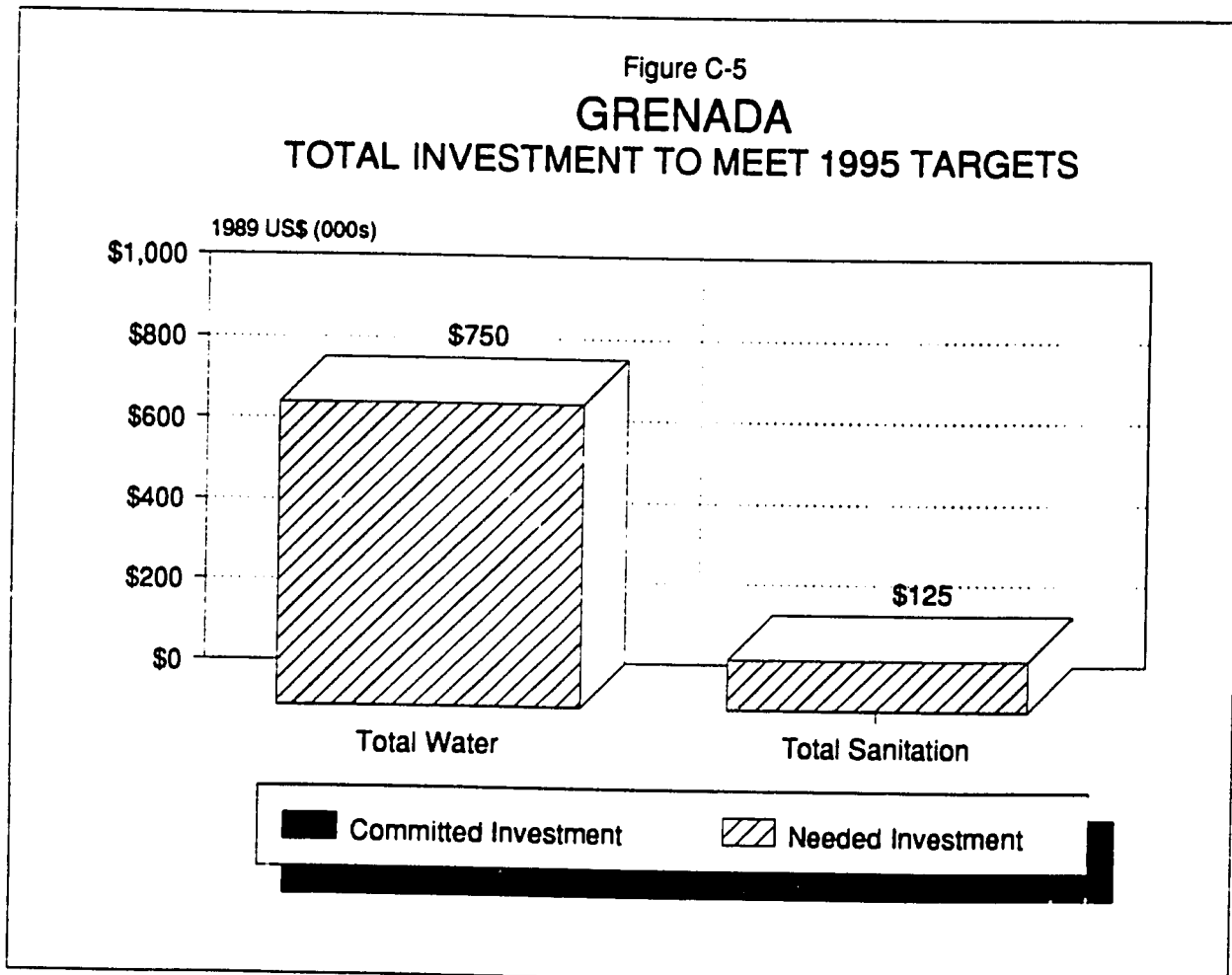
INVESTMENT NEEDED TO MEET
THE 1995 TARGETS

	WATER SUPPLY	SANITATION
	COVERAGE (PERSONS - 000s)	COVERAGE (PERSONS - 000s)
	TOTAL	TOTAL
TARGET FOR 1995 (000s)	83	83
COVERAGE IN 1989	77	82
REQUIRED INCREASE	6	1
UNIT COST PER CAPITA (\$)	\$125	\$125
ESTIMATED TOTAL COST TO MEET 1995 TARGET (\$000s)	\$750	\$125
COMMITTED FUNDS * (\$000s)	\$0	\$0
PROJECTED FUNDING SHORTFALL (\$000s)	\$750	\$125

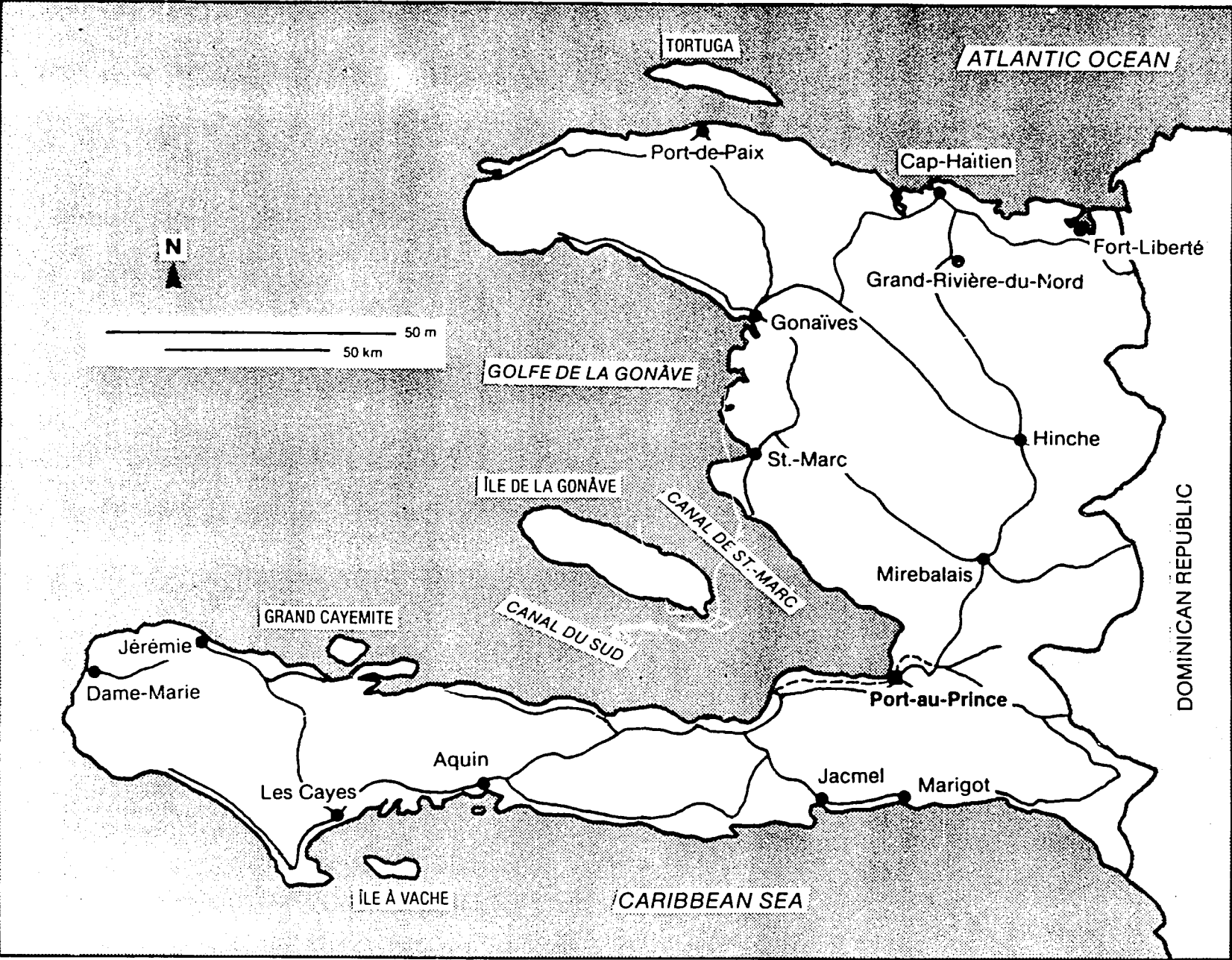
TOTAL FUNDING SHORTFALL:

\$875

* ONLY THOSE FIRMLY COMMITTED INVESTMENTS WHICH INCREASE COVERAGE



HAITI



Appendix D

Country Profile: HAITI

COUNTRY BACKGROUND

The Republic of Haiti, located on the western third of the island of Hispaniola, is the poorest country in the Western Hemisphere. Though the country's population is largely rural at this time (73 percent), an exodus of rural residents to the marginal areas of Port-au-Prince has been seen in recent years, and the urban population growth rate has risen to over 3.5 percent annually.

Politically, the country of Haiti has been in turmoil. Following the ouster of the country's longtime dictator "Baby Doc" Duvalier, the government has changed hands a number of times, through both elections and coups d'etat. With the annulment of elections in November 1987, the U.S. Government terminated all direct assistance to the Government of Haiti (GOH), and since that time, A.I.D. has channeled development funds through PVOs and NGOs working in the country.

Economically, Haiti has suffered from the constriction of the flow of foreign aid resulting from the political crises which have taken place in recent years. Since 1987, foreign aid disbursements have decreased significantly, and coffee exports have fallen. In 1989, however, the GOH signed a 15-month Stand-by Agreement with the International Monetary Fund, which could help to stabilize the economy and lay the groundwork for future economic growth.

In the health sector, water-related diseases, especially diarrhea, are among the main causes of infant and childhood morbidity and mortality. Contributing to this serious health problem are low rates of access to water and sanitation services, particularly in the rural areas of Haiti. Acute respiratory infections, malaria, and AIDS are also public health concerns in the country.

The GOH is supported by a number of agencies working in the water and sanitation sectors. The urban potable water corporation (*Centrale Autonome Metropolitaine d'Eau Potable*—CAMEP) serves the city of Port-au-Prince and its environs, and the National Water

1989 Population:	5.9 million (Urban—1.6, Rural—4.3)
Annual Population Growth:	Urban—3.52%, Rural—0.87%
Infant Mortality:	114
Child Mortality:	58
Incidence of Mortalities due to Diarrheal/Intestinal Diseases per 1,000 deaths:	390
Life Expectancy:	55 (Male—54, Female—57)
Adult Literacy:	Male—40%, Female—35%
GNP per Capita:	\$360
GNP per Capita Annual Growth (1965-87):	0.5%
Currency:	5.00 gourde = US\$1
Average Annual Inflation (1980-87):	7.9%

Service (*Service National d'Eau Potable—SNEP*) is responsible for coordinating the national water and sanitation policies for the country. In addition, the Ministry of Public Health (*Direction d'Hygiène Publique/Service du Genie Sanitaire et l'Assainissement—DHP/SGA*) and Haiti's rural water and sanitation agency (*Post Communautaire d'Hygiène Publique et d'Eau Potable—POCHEP*) work in the sector.

INVESTMENT AND COVERAGE LEVELS

Current Projects

A number of donors are working on water and sanitation development in Haiti, though a major project funded by A.I.D. and implemented by CARE ended in 1989 and will not be continued with A.I.D. assistance.

A.I.D.

With the completion of USAID/Haiti's Community Water Systems Development Project in 1989, A.I.D. does not currently support any major water and sanitation projects in Haiti. Under the \$8 million project, which was implemented by CARE, an estimated 153,000 persons in the southern peninsula of Haiti benefited from the construction of water systems.

Though A.I.D. does not plan to support future, capital-intensive water and sanitation projects in Haiti, USAID/Haiti intends to integrate potable water activities into ongoing child survival programs to provide limited financial assistance to PVOs interested in constructing small rural water systems in conjunction with their child survival efforts. Therefore, A.I.D. has earmarked approximately \$500,000 out of its \$22 million Voluntary Agencies for Child Survival (VACS) Project to support the efforts of various NGOs to provide potable water for rural communities throughout the country. This component of the VACS Project will begin in October 1990 and is scheduled to end in 1993. In addition, the VACS Project will also support a \$100,000 buy-in to the WASH Project.

Total Committed Funding to Increase Coverage (1990-1995): \$250,000

CARE

As mentioned above, CARE was the implementing organization for the A.I.D.-funded Community Water Systems Development Project, which was completed in 1989. Though A.I.D. does not plan to fund a follow-on project, CARE is currently looking for a funding source to continue the effort begun with this project.

In addition, CARE, through its Resources in Community Health Education Support Project, is working to enlarge and refine a countrywide, community-based, sustainable maternal and child health service-delivery system for isolated rural areas. Though this project, which will run from 1988 to 1991, does not contain a coverage-expansion component, CARE is working to increase hygiene awareness and to coordinate efforts between its health and water projects.

Total Committed Funding to Increase Coverage (1990-1995): \$0

CIDA

CIDA does not currently fund any water and sanitation projects in Haiti, though the Canadian agency is examining the possibility of working through an NGO to implement a small rural water supply and sanitation project.

Total Committed Funding to Increase Coverage (1990-1995): \$0

IDB

Since 1984, the IDB has provided loan financing to support efforts by POCHEP to construct 70 small water systems for rural communities. Currently in its second phase, the Community Health Post and Rural Drinking Water Supply Program is supported by an \$8.8 million loan from the IDB, with \$1.1 million from the GOH. This loan, which also includes funds to provide technical assistance to strengthen POCHEP's institutional capabilities and to train water system operators, is expected to be fully disbursed by 1991. This project will benefit approximately 110,000 persons in 100 villages located in nine departments of the country. This project also contains a component to develop proposals for new potable water projects.

The IDB also provides funds for the ongoing Port-au-Prince Storm Drainage Project. Under this project, work has been undertaken to rehabilitate the existing storm sewer system, expand the Port-au-Prince solid waste disposal system, and initiate erosion-control measures to improve public health for approximately 700,000 residents of Port-au-Prince. The IDB portion for the second phase of this project, which began in 1989 and will continue until 1992, comprises a \$51.8 million loan, with \$5.7 million from the GOH. Because this project does not contribute to increased coverage, these funds were not included in the funding analysis.

In addition to these ongoing efforts, the IDB is in the early stages of preparing a loan to finance the expansion and rehabilitation of water systems in intermediate-sized cities throughout the country. The implementing agency for this potential loan will be SNEP, though no funding information is available at this time.

Total Committed Funding to Increase Coverage (1990-1995): \$4,000,000

World Bank

The World Bank currently has one loan in the water and sanitation sector. The loan, signed in 1989, consists of a \$20 million loan from the World Bank, \$10 million in cofinancing from the French economic development agency, CCCE, and \$2.5 million from the GOH and the local construction company carrying out this work. Under this \$32.5 million project, to be implemented by CAMEP, the work will focus on improving Port-au-Prince's water services and strengthening CAMEP's institutional capabilities through the development of new water sources, installing new networks and connections, training CAMEP staff, and providing technical assistance for the implementation and design of subprojects. This project began in late 1989 and is scheduled to be completed in approximately five years. Since this loan will only partly finance the construction of water connections for persons currently without access to potable water, only 20 percent of the loan has been considered to increase coverage.

Total Committed Funding to Increase Coverage (1990-1995): \$6,500,000

Federal Republic of Germany

Through the German Technical Cooperation Agency (GTZ), the West German government supports an ongoing institution-building project for SNEP to enhance the agency's ability to expand and maintain the country's water and sanitation systems in Port-au-Prince. The first phase of this project, which included a planning workshop and technical assistance in institution building for SNEP, was financed with a grant of \$2.5 million and is scheduled to end in 1990. A second phase for this project was approved recently, and additional technical assistance will be provided through 1993. This component will cost \$6.6 million.

Total Committed Funding to Increase Coverage (1990-1995): \$3,300,000

UNICEF

UNICEF is providing assistance to two water and sanitation agencies in Haiti, SNEP and CAMEP, for the organization and management of water supplies and the promotion of basic sanitation in rural and urban slum areas. UNICEF's efforts have been focused primarily in the northwest region of the country and entail constructing gravity-fed water systems to serve Anse Rouge, Mole-St. Nicolas, Bassin Bleu, and Fiosson and conducting a spring-capping project in the rural villages of Jean Rabel and Mole-St. Nicolas. In the area of sanitation development, UNICEF has conducted pilot latrine construction projects on Jean Rabel and Leogane. UNICEF expects to expand the coverage of these efforts in coming years.

Total Committed Funding to Increase Coverage (1990-1995): \$300,000

Water and Sanitation Coverage (1985-1989)

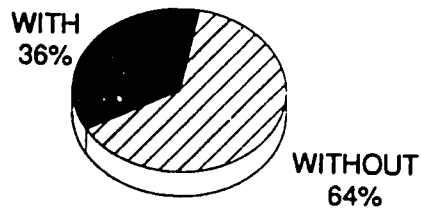
Population and coverage data were provided by the World Health Organization.

Haiti's water and sanitation coverage rates for both urban and rural populations are extremely low. Since 1985, when 59 percent of urban residents and 30 percent of rural residents had access to potable water, the number of persons with access has risen slightly, though at a rate lower than the population growth experienced in these regions. As seen in Table and Figure D-1, urban water coverage fell to 54 percent in 1989 while rural water coverage dropped by one percentage point to 29 percent.

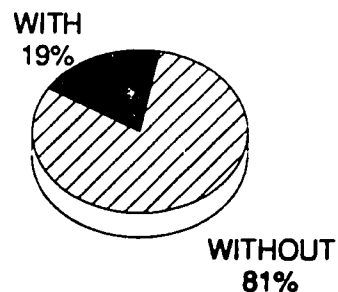
Access to basic sanitation facilities in Haiti is even more restricted than potable water access; 38 percent of the urban population and just 12 percent of the rural population were served by adequate sanitation facilities in 1989 (Table and Figure D-2). As in the water sector, the number of persons with coverage grew slightly over this period, though the percentage of the population with access fell in both the urban and rural areas.

The charts below show the 1989 water and sanitation coverage rates for the total population. Among the countries in this study, Haiti's combined urban and rural rates are approximately half those of the country with the next lowest coverage rates—the Dominican Republic.

1989 ACCESS TO WATER



1989 ACCESS TO SANITATION



MEETING THE TARGETS

1995 Targets

Given the low rates of water and sanitation coverage currently reported in Haiti, the 1995 targets are set to increase coverage substantially in all subsectors. As discussed in Chapter 2, these targets have not been developed with Haiti's participation and are simply intended for use as planning tools to gauge the progress that is being made in expanding water and sanitation services in Haiti.

As seen in Figures D-3 and D-4 and Table D-3, the 1995 targets call for an increase in urban water coverage from the current rate of 54 percent to 64 percent in 1995, an addition of 390,000 persons with access to potable water. The 1995 urban sanitation target is set to raise coverage from 38 percent to 52 percent of the urban population, an increase of 417,000 persons with access to sanitation facilities.

Among the much larger rural population of Haiti, the 1995 water target calls for an increase in the number of persons with coverage of 769,000, thereby raising coverage 16 percentage points to a level of 45 percent. The rural sanitation target is similarly ambitious. To raise the current level of coverage (12 percent) to the 1995 level of 30 percent, an additional 828,000 persons will have to gain access to some form of basic sanitation facility.

Meeting the 1995 Urban Water and Sanitation Targets

As seen in Table D-3 and Figure D-5, the levels of investment needed to meet the urban water and sanitation targets are large—\$58 million for urban water system construction and expansion and \$18 million for the construction of urban sanitation facilities. Currently, the IDB, the World Bank, and other donors have committed an estimated \$9 million to support the expansion of potable water coverage and about \$750,000 for the expansion of urban sanitation facilities. In order to meet the targets, however, \$49 million of additional financing will be needed to support the urban water subsector and nearly \$17.6 million for the urban sanitation subsector. Much of the financing needed for the urban water subsector may be available through a loan currently being prepared by the IDB to serve intermediate-sized cities throughout the country. This loan, however, is in the early stage of preparation and cannot be considered to be firmly committed.

Meeting the 1995 Rural Water and Sanitation Targets

Overall, the funding needed to meet the 1995 rural water target totals \$43 million, of which \$4.5 million is committed. The funding needs for rural sanitation are lower than those for rural water because the per capita unit cost for sanitation facilities in Haiti is half that for potable water. The total amount of funding needed for the construction of rural sanitation facilities is \$23 million, of which approximately \$100,000 has been committed at this time.

If Haiti is to increase substantially the number of rural residents served by adequate water and sanitation facilities, additional funding by bilateral and multilateral donors is clearly needed. Given the country's exceedingly low coverage rates, particularly among the rural population, an emphasis on expanding the availability of potable water and adequate sanitation facilities is needed.

TABLE D - 1
 HAITI

 ACTUAL WATER SUPPLY
 COVERAGE VERSUS 1995 TARGETS

YEAR	WATER SUPPLY								
	TOTAL POP-ULATION	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% SERVED	URBAN POP.	TOTAL SERVED	% SERVED	RURAL POP.	TOTAL SERVED	% SERVED
1985	5,269	1,992	38 %	1,405	826	59 %	3,864	1,166	30 %
1989	5,866	2,123	36 %	1,600	870	54 %	4,266	1,253	29 %
TARGETS FOR 1995	6,423	3,282	51 %	1,969	1,260	64 %	4,494	2,022	45 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

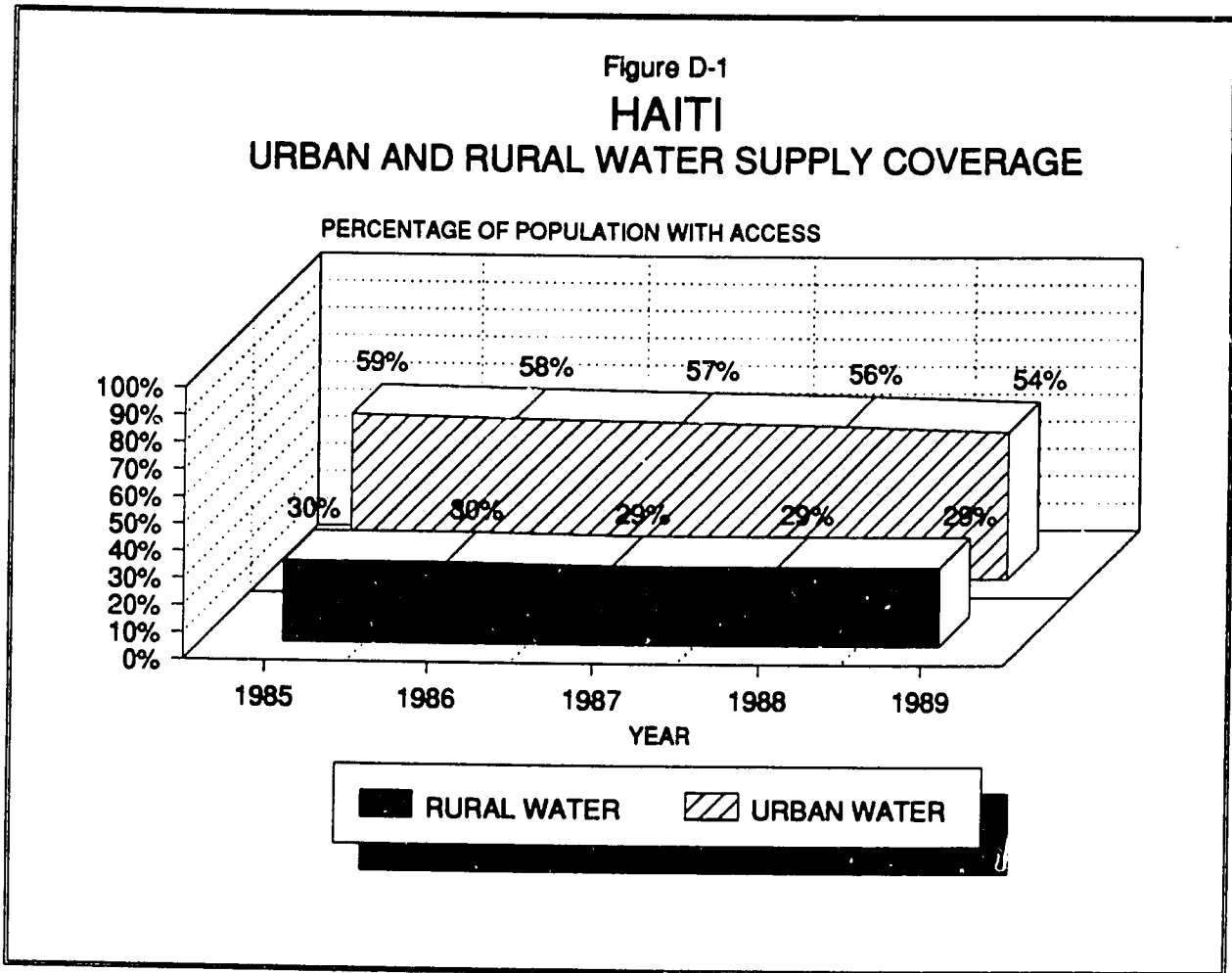


TABLE D - 2
 HAITI

 ACTUAL SANITATION
 COVERAGE VERSUS 1995 TARGETS

YEAR	SANITATION								
	TOTAL POP-ULATION	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% SERVED	URBAN POP.	TOTAL SERVED	% SERVED	RURAL POP.	TOTAL SERVED	% SERVED
1985	5,269	1,107	21 %	1,405	592	42 %	3,864	515	13 %
1989	5,866	1,127	19 %	1,600	607	38 %	4,266	520	12 %
1995 TARGET	6,463	2,372	37 %	1,969	1,024	52 %	4,494	1,348	30 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

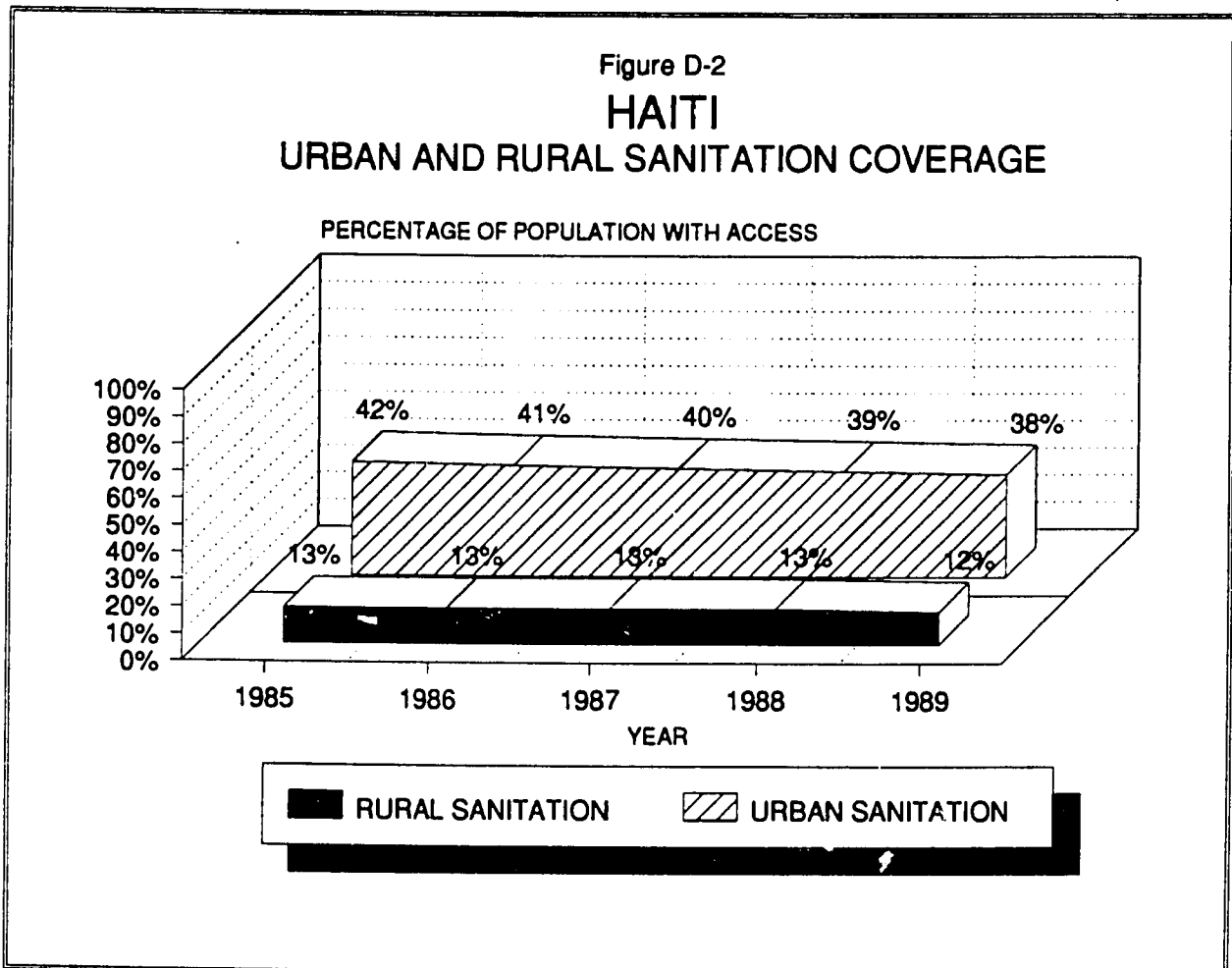


Figure D-3
HAITI
 1989 COV. & 1995 TARGETS (# OF PEOPLE)

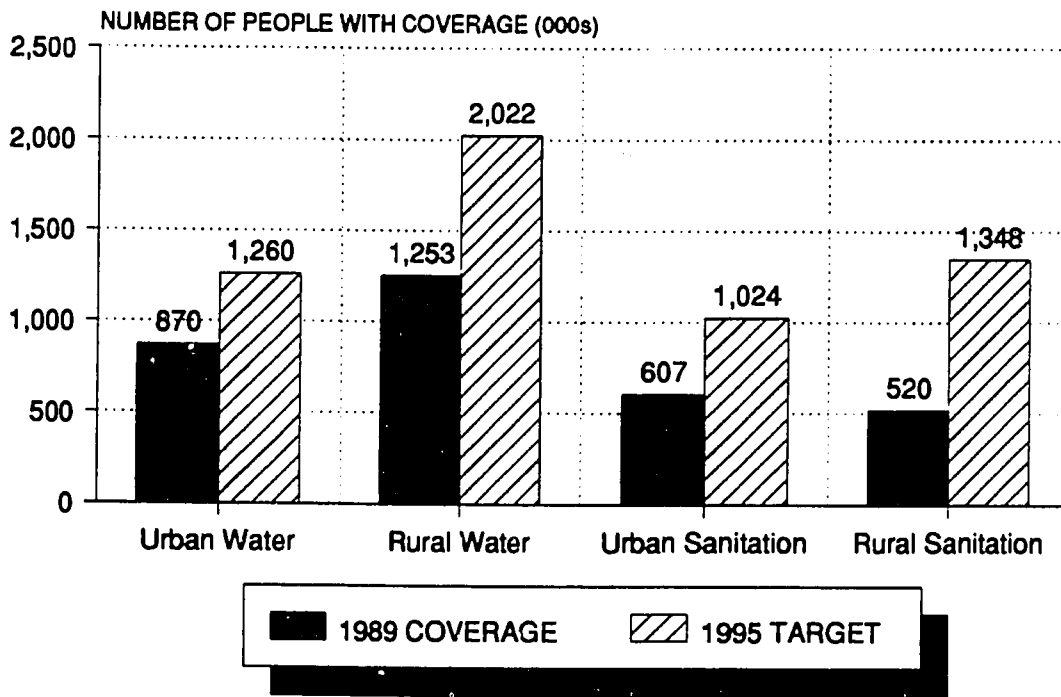


Figure D-4
HAITI
 1989 COVERAGE & 1995 TARGETS (% OF POP.)

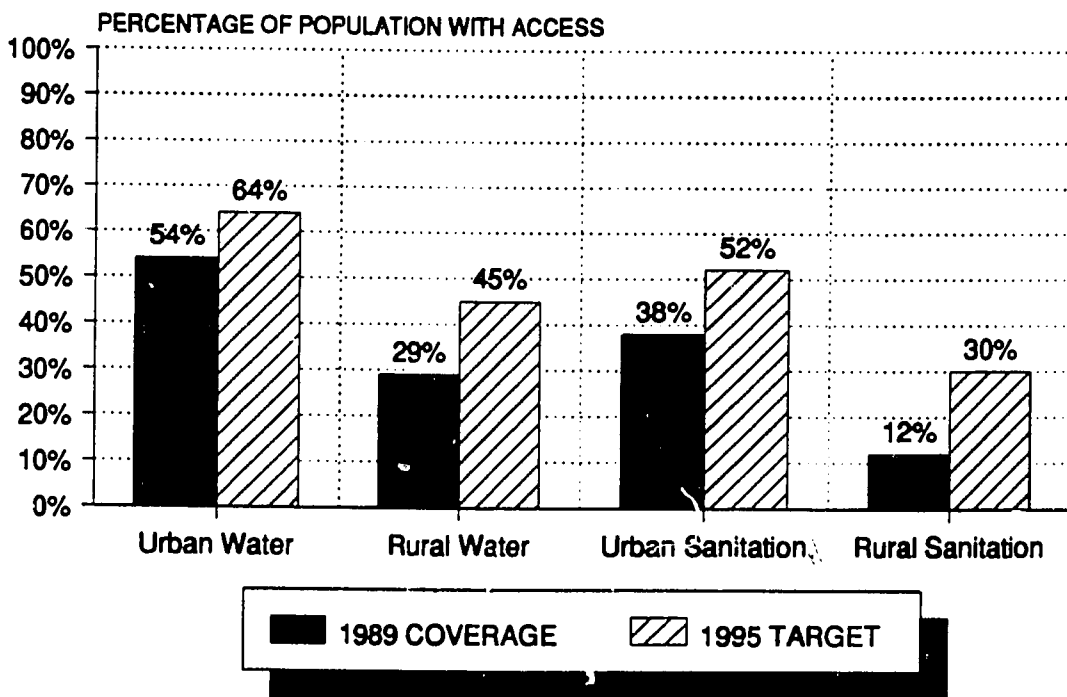


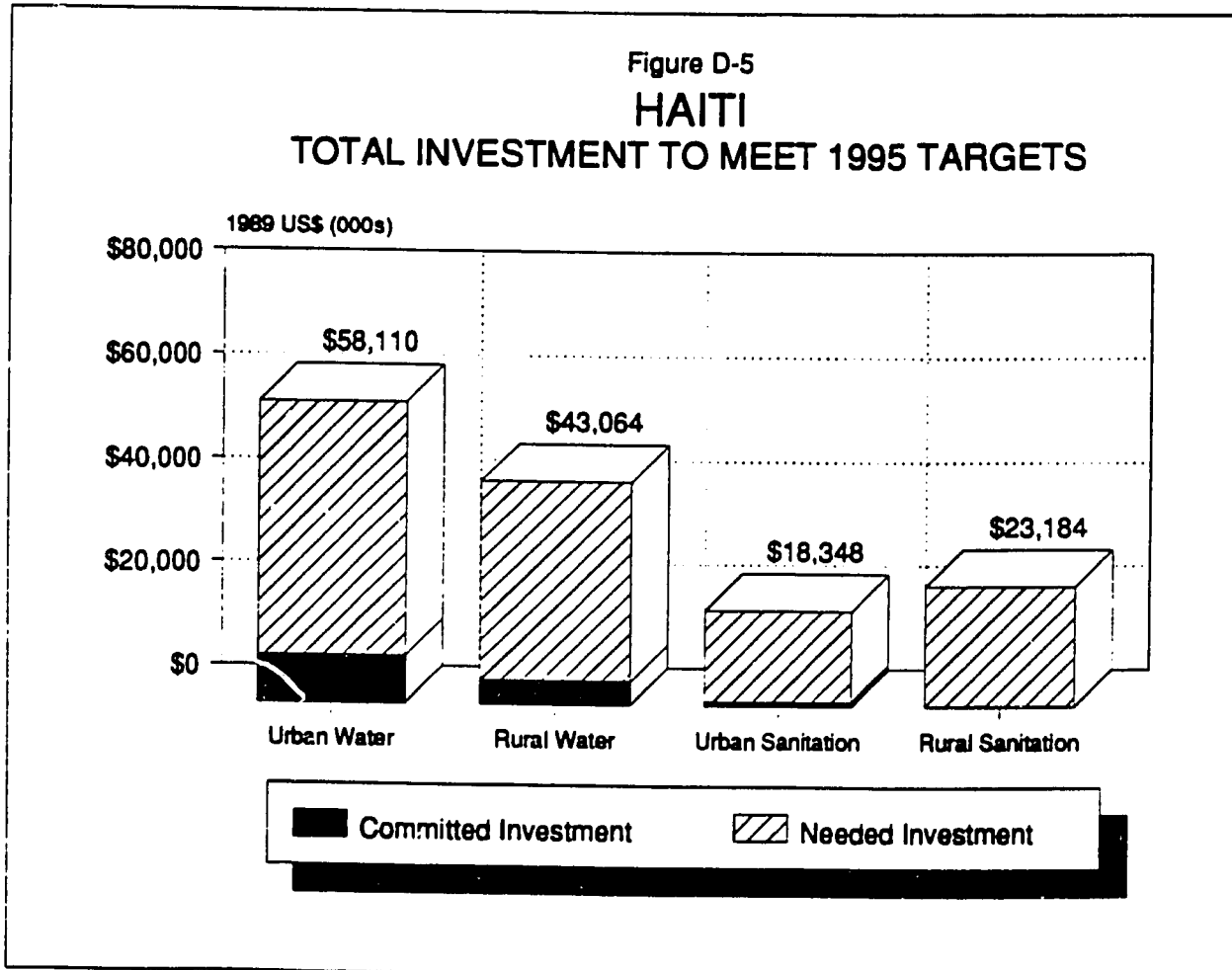
TABLE D - 3
 HAITI

 INVESTMENT NEEDED TO MEET
 THE 1995 TARGETS

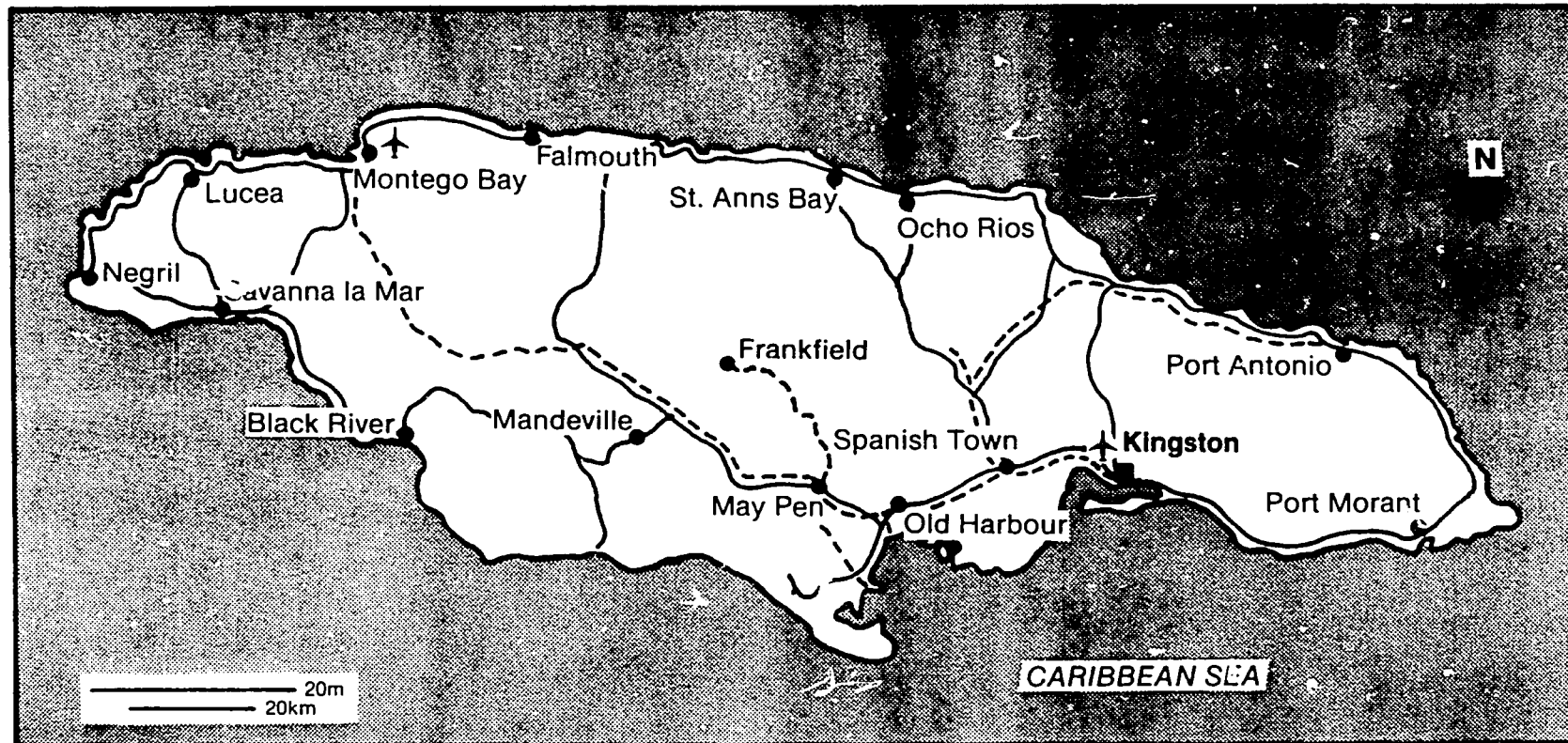
	WATER SUPPLY COVERAGE (PERSONS - 000s)			SANITATION COVERAGE (PERSONS - 000s)		
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL
TARGET FOR 1995 (000s)	3,282	1,260	2,022	2,372	1,024	1,348
COVERAGE IN 1989	2,123	870	1,253	1,127	607	520
REQUIRED INCREASE	1,159	390	769	1,245	417	828
UNIT COST PER CAPITA (\$)	N/A	\$149	\$56	N/A	\$44	\$28
ESTIMATED TOTAL COST TO MEET 1995 TARGET (\$000s)	\$101,174	\$58,110	\$43,064	\$41,532	\$18,348	\$23,184
COMMITTED FUNDS * (\$000s)	\$13,498	\$9,048	\$4,450	\$852	\$752	\$100
PROJECTED FUNDING SHORTFALL (\$000s)	\$87,676	\$49,062	\$38,614	\$40,680	\$17,596	\$23,084

TOTAL FUNDING SHORTFALL: **\$128,356**

* ONLY THOSE FIRMLY COMMITTED INVESTMENTS WHICH INCREASE COVERAGE



JAMAICA



Appendix E

Country Profile: JAMAICA

COUNTRY BACKGROUND

South of Cuba and west of Haiti, the relatively large island of Jamaica covers 284,000 square kilometers, though over 40 percent of the country's population is located in Kingston and its environs. Though the country benefits from full water and sanitation coverage, increasing demand for water, problems with salinated groundwater, and droughts have strained existing facilities.

The health status of Jamaicans is good; the infant mortality rate is low (17 in 1989) and the life expectancy is high—74. With the development of the country's health care systems in the past few decades, health problems have shifted away from infant and childhood disease and now consist primarily of chronic diseases of adults, such as diabetes and heart disease, and accident-related problems.

Jamaica's economy has benefited from pursuing structural adjustment toward a private sector led, export economy and away from its previous public sector dominated, import substitution economy. Tourism, which is the largest foreign exchange earning industry, has grown rapidly, though it has placed a burden on already problematic water supplies.

The agency responsible for overall water and sanitation management and planning in Jamaica is the National Water Commission (NWC), formed in 1980 by combining the National Water Authority and the Kingston-St. Andrews Water Commission. The NWC makes policy decisions relating to minor water scheme development and the secondary expansion of existing facilities, in consultation with other agencies involved in water and sanitation activities: the Ministry of Agriculture, Ministry of Construction, the Urban Development Corporation, the Ministry of Planning, Development, and Production, and the Caribbean Engineering Company, Ltd. Policy decisions on major water and sanitation investments, however, are generally made by the cabinet of the Government of Jamaica (GOJ).

1989 Population:	2.5 million (Urban—1.5, Rural—1.0)
Annual Population Growth:	1.2% (Urban—3.2%, Rural—N/A)
Infant Mortality:	17
Child Mortality:	5
Incidence of Mortalities due to Diarrheal/Intestinal Diseases per 1,000 deaths:	186
Life Expectancy:	74 (Male—71, Female—77)
Adult Literacy:	Male—96%, Female—97%
GNP per Capita:	\$940
GNP per Capita Annual Growth (1965-87):	-1.5%
Currency:	6.95 dollars = US\$1
Average Annual Inflation (1980-87):	19.4%

INVESTMENT AND COVERAGE LEVELS

Current Projects

Jamaica currently benefits from a number of water and sanitation projects funded by A.I.D., the World Bank, the European Economic Community (EEC), and others. Major new investments include a large water and sanitation project under development by the IDB, as well as a major infrastructure project to be cofinanced by JICA and A.I.D.

A.I.D.

USAID/Jamaica currently supports three water and sanitation projects in Jamaica. Under the Jamaica Shelter and Urban Services Policy Program, approximately \$5 million in Housing Guarantee loan financing has been earmarked for the construction of water and sewerage connections, communal water system development, shelter-related and off-site water and sanitation infrastructure development, water loss management, and minor water scheme development. The principal implementing organization is the NWC, working in cooperation with the Ministry of Construction (housing) and the Urban Development Corporation (UDC). Design of this program component began in September 1988 and will be implemented through September 1990, with the possible expansion of activities past this date.

The second effort in this sector comes through A.I.D.'s Hurricane Reconstruction Project, which provides \$5 million in grants to procure commodities and services to assist in the repair nationwide of water and sanitation infrastructure facilities damaged by Hurricane Gilbert in September 1988. The project, which began in March 1989, is scheduled to be completed by August 1990 and will be implemented chiefly through the NWC.

The Inner Kingston Development Project began in September 1988 and is being implemented by the UDC. Under this project, \$4.17 million in loan financing is being used to rehabilitate the central sewerage infrastructure in downtown Kingston. As part of the overall infrastructure development program, plans are to improve the trunk sewer systems in the Harbour Street corridor, replace approximately 10,000 feet of sewer lines in individual development areas, and replace approximately 36,000 feet of water mains. These improvements are intended to promote commercial and industrial development in the area rather than providing additional connections to residential areas.

A.I.D., in conjunction with JICA, is developing an important \$80 million infrastructure development project which will include a component for water and sanitation development. Though not yet approved, this proposed project will be financed with \$60 million from JICA and \$20 million from A.I.D.

A.I.D. is also in the process of putting together a concept paper to examine the possibility of funding a project to benefit the NWC by providing training for NWC staff, improving the commission's organizational management, and improving cost recovery for the country's water and sewerage systems.

Total Committed Funding to Increase Coverage (1990-1995): \$3,000,000

EEC

The EEC has recently entered into an agreement with the GOJ to provide \$26 million to support sewerage infrastructure development in the areas of Negril and Ocho Rios. This project continues the work begun by A.I.D. in preparing feasibility studies for the two regions. Under this loan, detailed design studies and project implementation procedures will be developed with the NWC in cooperation with the Caribbean Engineering Company, Ltd. This project, which will begin in 1990, is expected to end in 1995 and will contribute only partially to increased coverage for Negril and Ocho Rios.

Total Committed Funding to Increase Coverage (1990-1995): \$2,600,000

Caribbean Development Bank

The CDB is currently providing \$1 million in loan funds for the rehabilitation of some major water trunks partially damaged by Hurricane Gilbert.

Total Committed Funding to Increase Coverage (1990-1995): \$0

IDB

The IDB has, in previous years, financed substantial urban water supply system construction projects in Montego Bay, Falmouth, and Mandeville. Currently, however, it does not have any active loans in this subsector, although it recently conducted a review of the NWC and is considering the development of an island-wide sanitation project. This loan is in the early stages of conceptualization and no funding information is available at this time.

Total Committed Funding to Increase Coverage (1990-1995): \$0

World Bank

The World Bank has one ongoing water and sanitation loan in Jamaica. Through this loan, disbursements have been made to provide technical assistance to the NWC, to rehabilitate the Kingston water supply and sewerage systems, and purchase maintenance equipment for the NWC. This \$12 million project is financed by \$9 million from the World Bank and \$3 million from the GOJ. Final disbursements will be made in 1990.

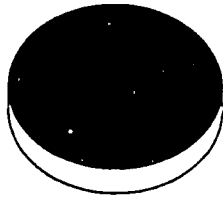
In addition to the ongoing loan for Kingston, the World Bank is currently examining a countrywide water and sewerage program to support water supply and sewerage extension and rehabilitation as well as institutional development for the NWC. Though precise funding information is not yet available, the World Bank may be looking for cofinancing for this \$70 million project.

Total Committed Funding to Increase Coverage (1990-1995): \$1,000,000

Water and Sanitation Coverage (1985-1989)

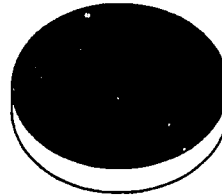
Though precise coverage data for Jamaica are scarce, data from PAHO and RHUDO/Jamaica indicate that Jamaica has full water and sanitation coverage. At this time, infrastructure development efforts have been focused upon the upgrading of existing systems rather than the construction of simple water and sanitation alternatives for persons unserved by an adequate facility (e.g., community standpipes and pit latrines). As seen in Tables and Figures E-1 and E-2, water and sanitation coverage has expanded in urban areas by approximately 230,000 persons from 1985 to 1989. In rural areas of the country, however, the population has decreased by 90,000 and coverage remains at 100 percent (see charts below).

1989 ACCESS TO WATER



WITH
100%

1989 ACCESS TO SANITATION



WITH
100%

MEETING THE TARGETS

1995 Targets

For Jamaica, the 1995 targets are set to maintain full coverage in all four subsectors: urban water, rural water, urban sanitation, and rural sanitation. As seen in Figures E-3 and E-4 and Table E-3, an additional 305,000 urban residents with water and sanitation facilities will be needed to maintain full coverage. With the projected decline in the country's rural population, no additional connections are needed in this sector. It should be noted, however, that Jamaica is actively working to upgrade its water systems, some of which are 200 years old. The basis of this report's methodology, which uses broad definitions of water and sanitation coverage, does not capture the need and the interest on the part of the Jamaican government, as well as external support agencies, to provide higher-quality water systems and sanitation facilities to a larger portion of the country's low-income population.

Meeting the 1995 Urban Water and Sanitation Targets

As seen in Table E-3 and Figure E-5, an estimated \$76 million will be needed to meet the 1995 urban water and sanitation targets. Given the currently committed investments by bilateral and multilateral donors of \$2 million for urban water system expansion and \$5 million for the construction and expansion of urban sanitation facilities, shortfalls of funding total \$36 million for urban water and \$34 million for urban sanitation. The loans currently being considered by the IDB, the World Bank, JICA, and A.I.D. will, if approved and implemented, provide much of the financing needed to achieve these goals.

TABLE E - 1
 JAMAICA

 ACTUAL WATER SUPPLY
 COVERAGE VERSUS 1995 TARGETS

YEAR	WATER SUPPLY								
	TOTAL POP-ULATION	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% SERVED	URBAN POP.	TOTAL SERVED	% SERVED	RURAL POP.	TOTAL SERVED	% SERVED
1985	2,326	2,326	100 %	1,233	1,233	100 %	1,093	1,093	100 %
1989	2,466	2,466	100 %	1,464	1,464	100 %	1,002	1,002	100 %
TARGETS FOR 1995	2,640	2,640	100 %	1,769	1,769	100 %	871	871	100 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

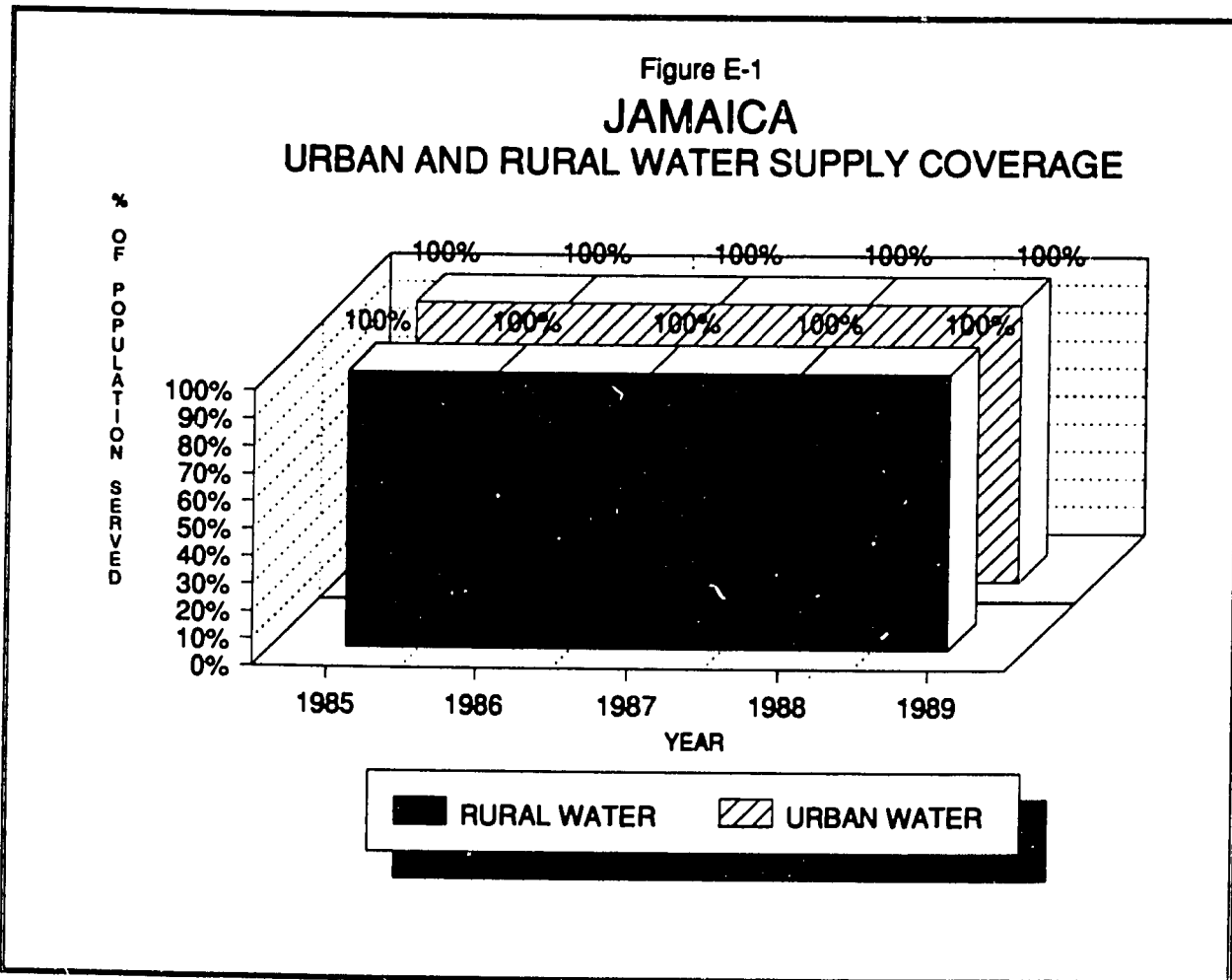


TABLE E - 2
 JAMAICA

 ACTUAL SANITATION
 COVERAGE VERSUS 1995 TARGETS

YEAR	TOTAL POP-ULATION	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% SERVED	URBAN POP.	TOTAL SERVED	% SERVED	RURAL POP.	TOTAL SERVED	% SERVED
		1985	2,326	2,326	100 %	1,233	1,233	100 %	1,093
1989	2,466	2,466	100 %	1,464	1,464	100 %	1,002	1,002	100 %
1995 TARGET	2,640	2,640	100 %	1,769	1,769	100 %	871	871	100 %

POPULATION FIGURES ARE ROUNDED TO NEAREST THOUSAND

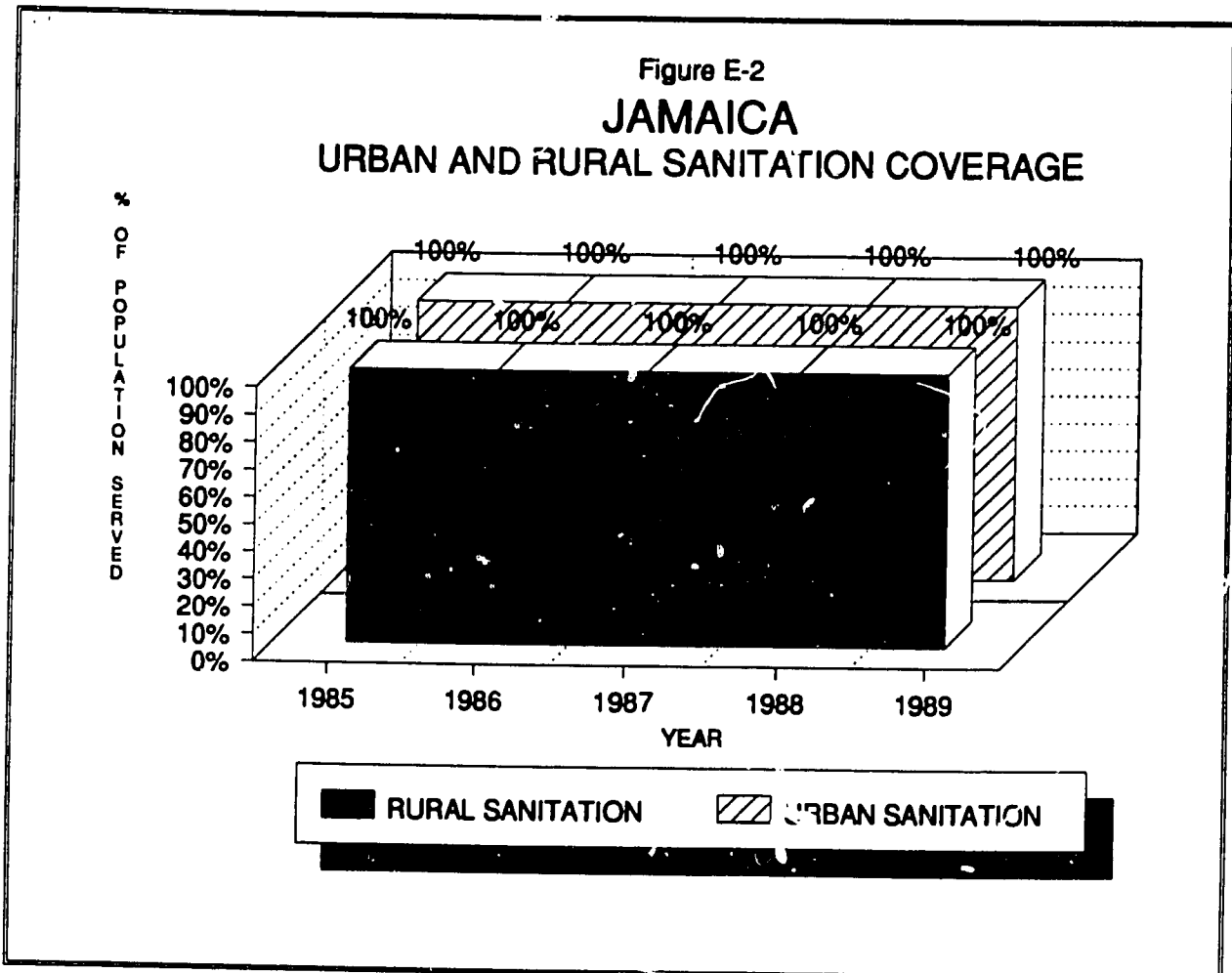
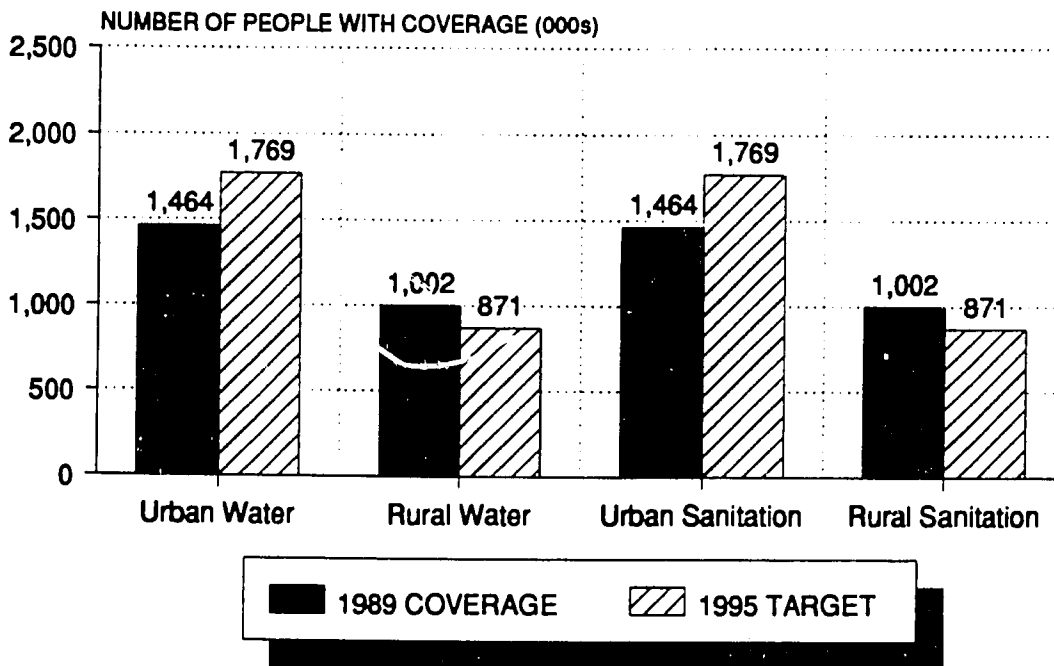
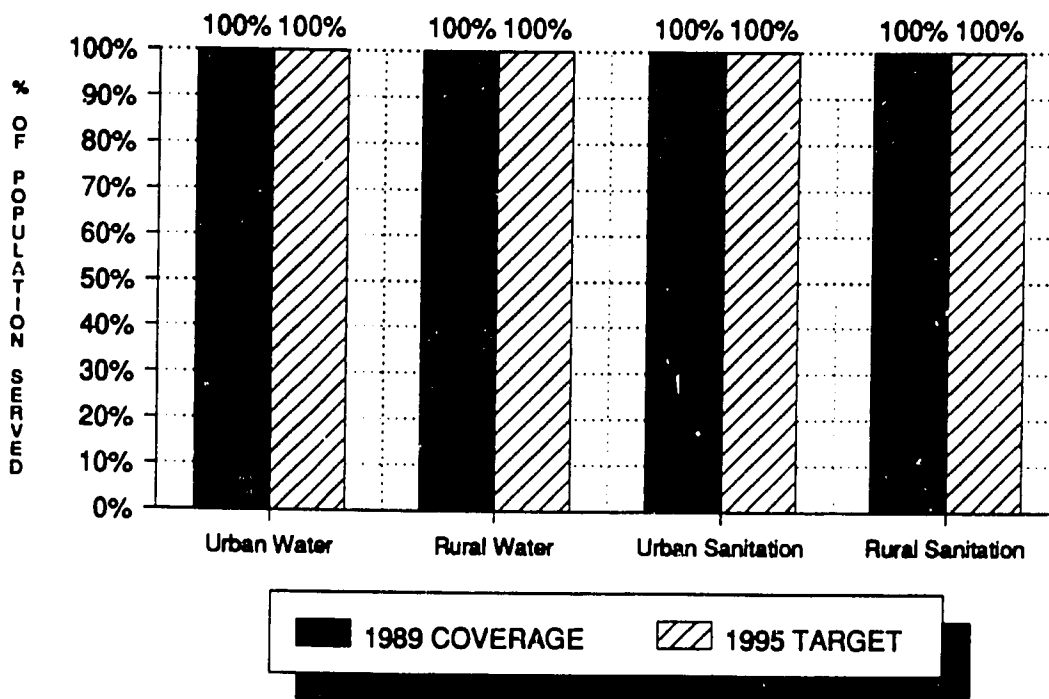


Figure E-3
JAMAICA
 1989 COV. & 1995 TARGETS (# OF PEOPLE)*



* Smaller rural targets are lower due to a negative rural population growth rate.

Figure E-4
JAMAICA
 1989 COVERAGE & 1995 TARGETS (% OF POP.)



88

TABLE E - 3
JAMAICA

INVESTMENT NEEDED TO MEET
THE 1995 TARGETS

	WATER SUPPLY COVERAGE (PERSONS - 000s)			SANITATION COVERAGE (PERSONS - 000s)		
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL
TARGET FOR 1995 (000s)	2,640	1,769	871	2,640	1,769	871
COVERAGE IN 1989	2,466	1,464	1,002	2,466	1,464	1,002
REQUIRED INCREASE	174	305	0	174	305	0
UNIT COST PER CAPITA (\$)	N/A	\$125	\$50	N/A	\$125	\$50
ESTIMATED TOTAL COST TO MEET 1995 TARGET (\$000s)	\$38,125	\$38,125	\$0	\$38,125	\$38,125	\$0
COMMITTED FUNDS * (\$000s)	\$2,000	\$2,000	\$0	\$4,600	\$4,600	\$0
PROJECTED FUNDING SHORTFALL (\$000s)	\$36,125	\$36,125	\$0	\$33,525	\$33,525	\$0

TOTAL FUNDING SHORTFALL:

\$69,650

* ONLY THOSE FIRMLY COMMITTED INVESTMENTS WHICH INCREASE COVERAGE

