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PLANNING FOR WATER AND SANITATION PROGRAMS IN CENTRAL AMERICA

Field Report No. 334
August 1991



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WASH Field Report No. 334

**PLANNING FOR WATER
AND SANITATION PROGRAMS
IN CENTRAL AMERICA**

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by

Michelle Mendez

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Related WASH Reports

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.

Planning for Water and Sanitation Programs in the Caribbean. Field Report No. 303, June 1990.

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

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

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

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

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ACRONYMS

A.I.D.	U.S. Agency for International Development/Washington
ANDA	<i>Administración Nacional de Acueductos y Alcantarillados</i> (Salvadoran national water and sewerage agency)
AyA	<i>Instituto Costarricense de Acueductos y Alcantarillados</i> (Costa Rican national water and sewerage agency)
CABEI	Central American Bank for Economic Integration
CAI	Central American Initiative
CAPRE	<i>Comité de Agua Potable para la Región</i> (Regional Potable Water Committee with headquarters in Costa Rica)
CARE	An international private voluntary organization
CDC	Commonwealth Development Corporation (United Kingdom)
CEPRHI	<i>Comité Ejecutivo Protector de los Recursos Hídricos</i> (Salvadoran coordinating committee)
CIDA	Canadian International Development Agency
CONAGUA	<i>Comité Nacional de Agua</i> (Guatemala National Water Committee)
CONIAPOS	<i>Comité Nacional de Instituciones de Agua Potable y Saneamiento</i> (Salvadoran water and sanitation policy-determining committee)
COPECAS	<i>Comité Permanente de Coordinación de Agua Potable y Saneamiento</i> (Guatemala permanent water and sanitation coordinating committee)
COSUDE	Swiss International Development Assistance Agency
DA	Development Assistance (A.I.D.)
EEC	European Economic Community

EMPAGUA	<i>Empresa Municipal de Agua de la Ciudad de Guatemala</i> (Guatemala City Municipal Water Authority)
ESA	External support agency
ESF	Economic Support Funds (A.I.D.)
FDQRI	Intergrated Rural Development Program (Nicaragua)
GDP	Gross Domestic Product
GNP	Gross National Product
GOB	Government of Belize
GOCR	Government of Costa Rica
GOES	Government of El Salvador
GOG	Government of Guatemala
GOH	Government of Honduras
GON	Government of Nicaragua
GOP	Government of Panama
GTZ	German Agency for Technical Cooperation
HG	Housing Guarantee Loan Program (A.I.D.)
IBRD	International Bank for Reconstruction and Development (World Bank)
IDAAN	<i>Instituto de Acueductos y Alcantarillados Nacionales</i> (Panamanian national water and sewerage agency)
IDB	Inter-American Development Bank
IFAM	<i>Instituto de Fomento y Asesoría Municipal</i> (Costa Rica Municipal Training and Technical Assistance Institute)
INAA	<i>Instituto Nicaragüense de Acueductos y Alcantarillados</i> (Nicaraguan Institute for Water and Sanitation)

IPTBH	Improved Productivity Through Better Health Project (Belize)
JICA	Japanese International Cooperation Agency
KfW	Reconstruction Loan Corporation (Federal Republic of Germany)
LAC	Bureau for Latin America and the Caribbean (A.I.D.)
MEA-CONARA	National Program for Popular Housing Project (El Salvador)
MOH	Ministry of Health
NGO	Non-governmental organization
PAHO	Pan American Health Organization (unit of World Health Organization)
PLANSABAR	<i>Planificación Nacional de Saneamiento Básico Rural (El Salvador Basic Rural Sanitation Planning Organization, an entity of the Ministry of Public Health)</i>
PSIP	Public Services Improvement Project (El Salvador)
PVO	Private voluntary organization
RHUDO	Regional Housing and Urban Development Office (A.I.D.)
ROCAP	Regional Office for Central America and Panama (A.I.D.)
SEGEPLAN	Guatemala's General Secretariat of the National Council for Economic Planning
SANAA	<i>Servicio Autónomo Nacional de Acueductos y Alcantarillados (Honduran National Autonomous Agency for Water and Sewerage)</i>
UNDP	United Nations Development Programme
UNEPAR	<i>Unidad Ejecutora del Programa de Acueductos Rurales (Guatemala Implementing Unit for Rural Water Programs, an entity of the Ministry of Public Health)</i>
UNICEF	United Nations Children's Fund

USAID U.S. Agency for International Development/overseas missions

VLWS Village Level Water and Sanitation Project (Belize)

WASA Water and Sewerage Authority (Belize—entity of the Ministry of Energy and Communications)

WASH Water and Sanitation for Health Project

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PREFACE

CHOLERA AND THE WATER AND SANITATION SECTOR IN LATIN AMERICA

The cholera epidemic in this hemisphere represents a public health emergency for the Central American region and a challenge to USAID missions in the region. The lack of safe water and basic sanitation documented in this study makes it very likely that cholera will become endemic throughout Central America.

The control of the spread of cholera and its ultimate reduction and elimination will only occur with the improvement of environmental health conditions. Specific areas that need to be assessed, improved, and monitored include water quality, water quantity, waste management, and hygiene behavior. Most critical for Central America is the need to develop and implement strategies for extending low-cost, appropriate sanitation coverage. Similarly, increased efforts to improve health education and hygiene behavior are crucial. Wastewater treatment, while essential to the long-term control of cholera and other waterborne diseases, should be selectively implemented—in the high impact areas—because of its relatively high cost vs. the financial condition of most Central American countries.

Cholera is bringing increased attention to the need to improve water supply and sanitation services in Central America. There is an exceptional opportunity for the sector to attract funds for investing to new and rehabilitated infrastructure. But, the improvements that are needed will not be achieved by simply pouring more money into the sector. Current information—particularly from the recent assessment of a collaborative program for Central America—indicates that the present capacity of the sector to absorb and effectively use financial and human resources is limited. Building that capacity will require well focused technical assistance, not only to develop institutional and human resources but also to address fundamental weaknesses in sector organization and policies. A well organized sector with a sound policy framework would then enable effective use of investment funds and ensure the coordination of the efforts of governments, NGOs, the private sector, and external support agencies.

EXECUTIVE SUMMARY

This report is the third annual update of a Water and Sanitation for Health (WASH) study of the water and sanitation sector in Central America prepared for the LAC Bureau of the U.S. Agency for International Development. It covers Belize, Guatemala, Honduras, El Salvador, Costa Rica, Nicaragua, and Panama.

This study assesses the current (through the end of 1990) availability of water supply and sanitation services in Central America and Panama, and measures progress toward goals established by WASH. As in previous years, this report analyzes ongoing and proposed investments to estimate the additional funding needed to meet the specified WASH targets.

Definitional Framework

The definitional framework employed in this report is the same as that used in the previous studies. Water and sanitation coverage is a tally of the population with access to at least minimal services, and is expressed either in terms of numbers of persons or as a percentage of the total estimated population. The following definitions are used:

- Generally speaking, urban areas are defined as population centers of 2,000 or more. (The various country sources of information on population may not have strictly followed this definition.)
- Water supply coverage includes persons with access through a direct connection or a water system outlet (standpipe or public fountain) within 200 meters of the home. Coverage estimates also count persons services by water vendors.
- Sanitation coverage includes those with an in-house or in-compound sewerage connection, septic tank, or latrine.

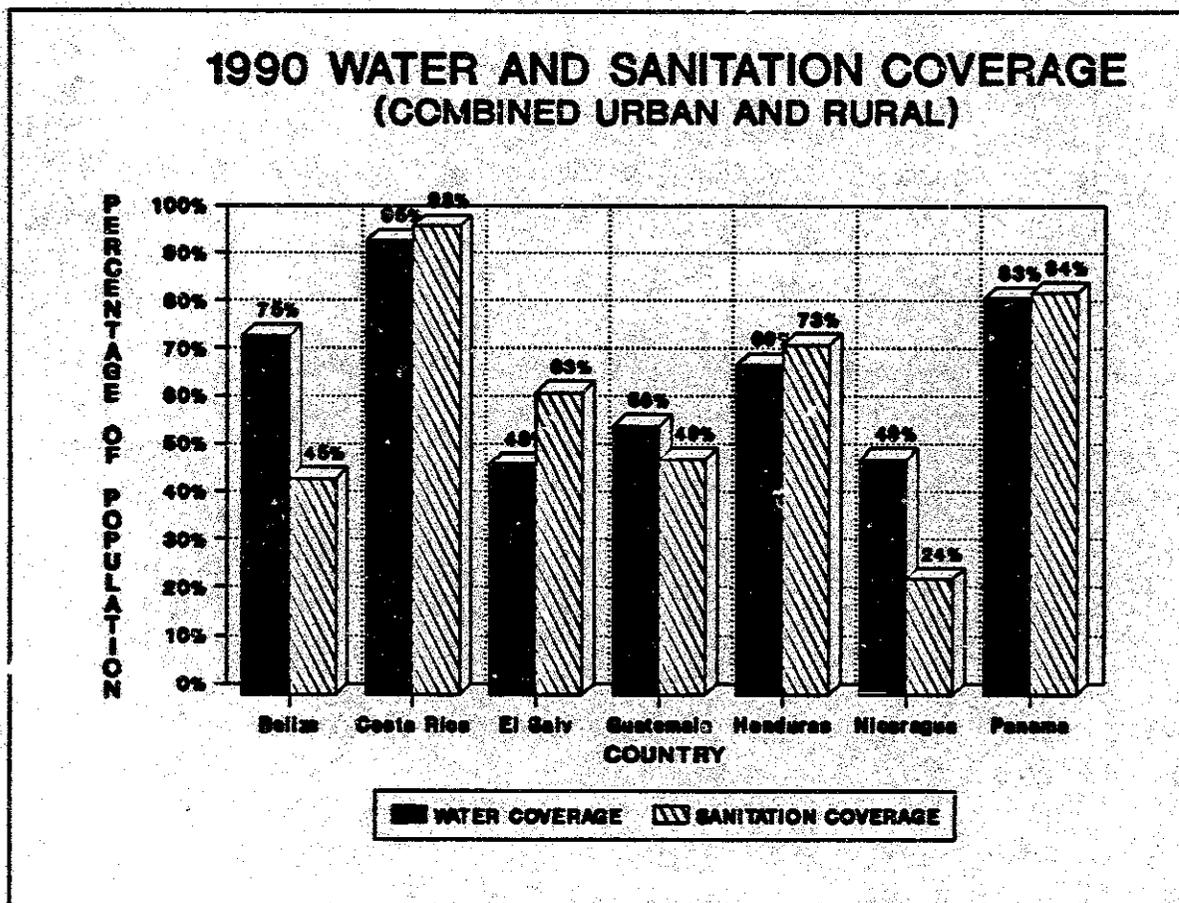
This report does not mark distinctions in the quality of service provided. All persons reported to have coverage are considered to have at least minimal access to water and sanitation services as defined above.

Access to Water and Sanitation Services in 1990

In 1990, access to water supplies in the region ranged from a low of 48 percent in El Salvador (followed closely by 49 percent in Nicaragua) to a high of 95 percent in Costa Rica.

Access to sanitation services ranged from 24 percent in Nicaragua to 98 percent in Costa Rica. Coverage figures for each country are illustrated graphically in Figure 1.

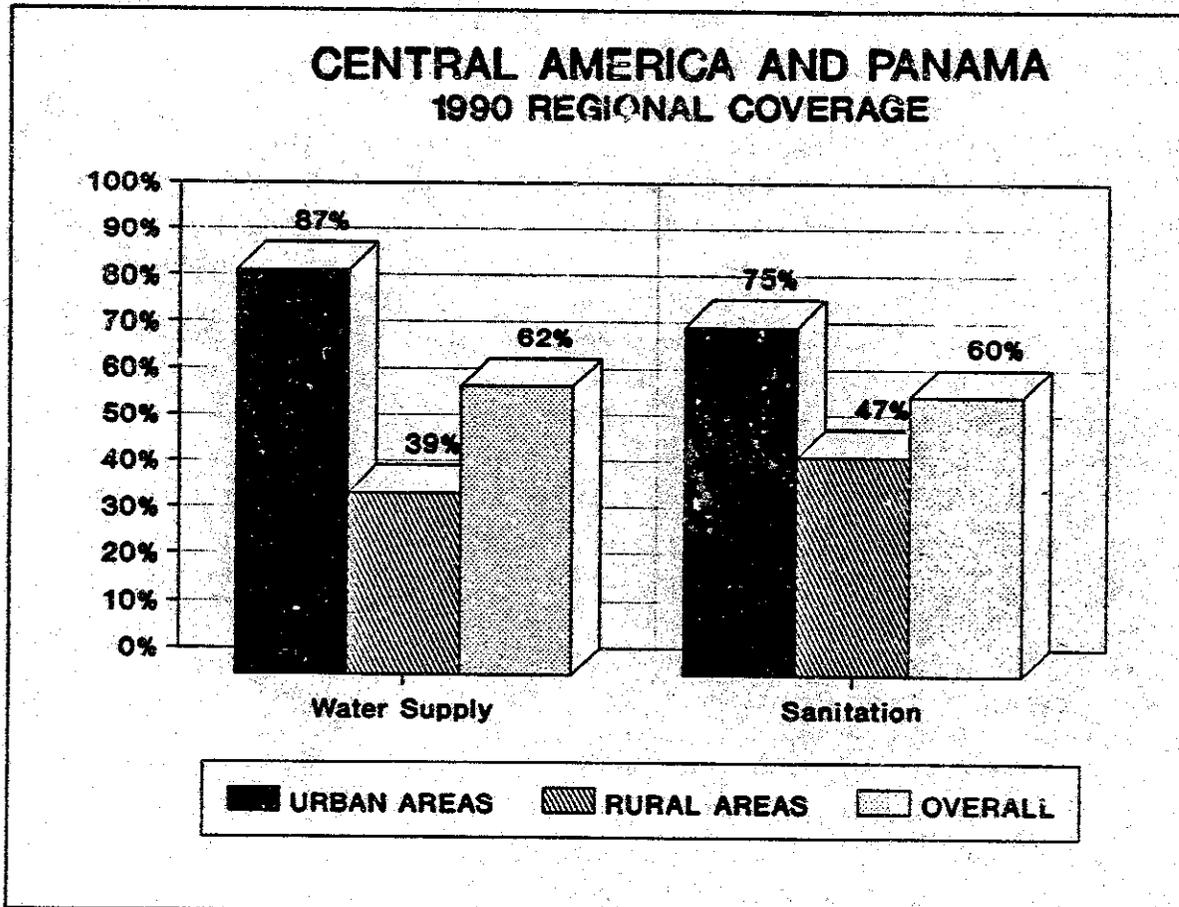
Figure 1



Overall, an estimated 62 percent of the 29 million inhabitants of Central America and Panama had access to water supply services and 60 percent had access to sanitation. The

disparity between urban and rural service provision remained virtually unchanged during the past decade. In 1990, throughout the region, 87 percent of urban residents had adequate water supply access, and 75 percent had access to sanitary waste systems. Only 39 percent of rural dwellers in the region had access to a water service, and 47 percent had access to sanitation services. Regional coverage is illustrated in Figure 2 below.

Figure 2



1995 WASH Targets

The coverage objectives referenced in this report are goals for urban and rural populations in each country with access to water and sanitation facilities. The targets, which are expressed as percentages, are estimates of the progress required by 1995 if full coverage is

to be achieved by the year 2020. These goals do not necessarily reflect each country's current development plans for the sector.

The WASH targets seek to raise regional water supply coverage from 62 percent in 1990 to 70 percent in 1995, and sanitation coverage from 60 percent to 68 percent. Based on current population trends, approximately 5.4 million more persons will require access to safe water and 5.5 million will need access to sanitation to meet the targets.

Funding Requirements and Shortfalls

Funding needed to meet the 1995 targets was estimated by multiplying the number of additional persons to receive coverage by per capita costs of providing services in each country. Unit costs are based on figures developed by PAHO.

The funding needed to increase regional access to water supplies and sanitation is approximately \$1.1 billion (Table 1). Required regional investments in urban water are nearly \$282 million, which, added to an estimated \$295 million for rural water, make a total of \$577 million. A similar resource commitment (\$524 million) is needed in sanitation, with \$461 million required to meet urban coverage goals, and \$63 million needed for rural areas. The disparity in costs to meet urban and rural targets is in part a consequence of heavy urbanization throughout the region. It is also a result of differences in per capita unit costs, largely explained by the widespread installation of latrines rather than sewerage services in rural areas.

WASH's estimate of current funding commitments for the region, shown in Table 1, includes only investments in efforts to extend coverage to persons currently unserved by basic facilities, and excludes efforts in areas such as rehabilitation and institutional strengthening. Funding shortfalls, also detailed in Table 1, are the difference between current commitments and the total estimated cost to achieve the WASH goals. Approximately 18 percent of the more than \$1 billion necessary to reach the targetted coverage levels is currently committed, resulting in a deficit of \$925 million. Deficits by subsector are: \$251 million for urban water; \$189 million for rural water; \$445 million for urban sanitation; and \$40 million for rural sanitation.

Without substantial additional resource commitments, the Central American nations will be unable to meet the WASH targets. Current coverage in three countries, Guatemala, Nicaragua, and El Salvador, is dangerously low, especially against the current cholera threat; these countries must remain priorities for future assistance. Two of these nations—Guatemala and Nicaragua—along with Honduras, also face the most critical funding shortages in the region. Deficits for these countries are estimated as follows: Guatemala at \$235 million, Nicaragua at \$157 million, and Honduras at \$212 million.

TABLE 1**Estimated Funding Needed to Meet 1995 Targets**

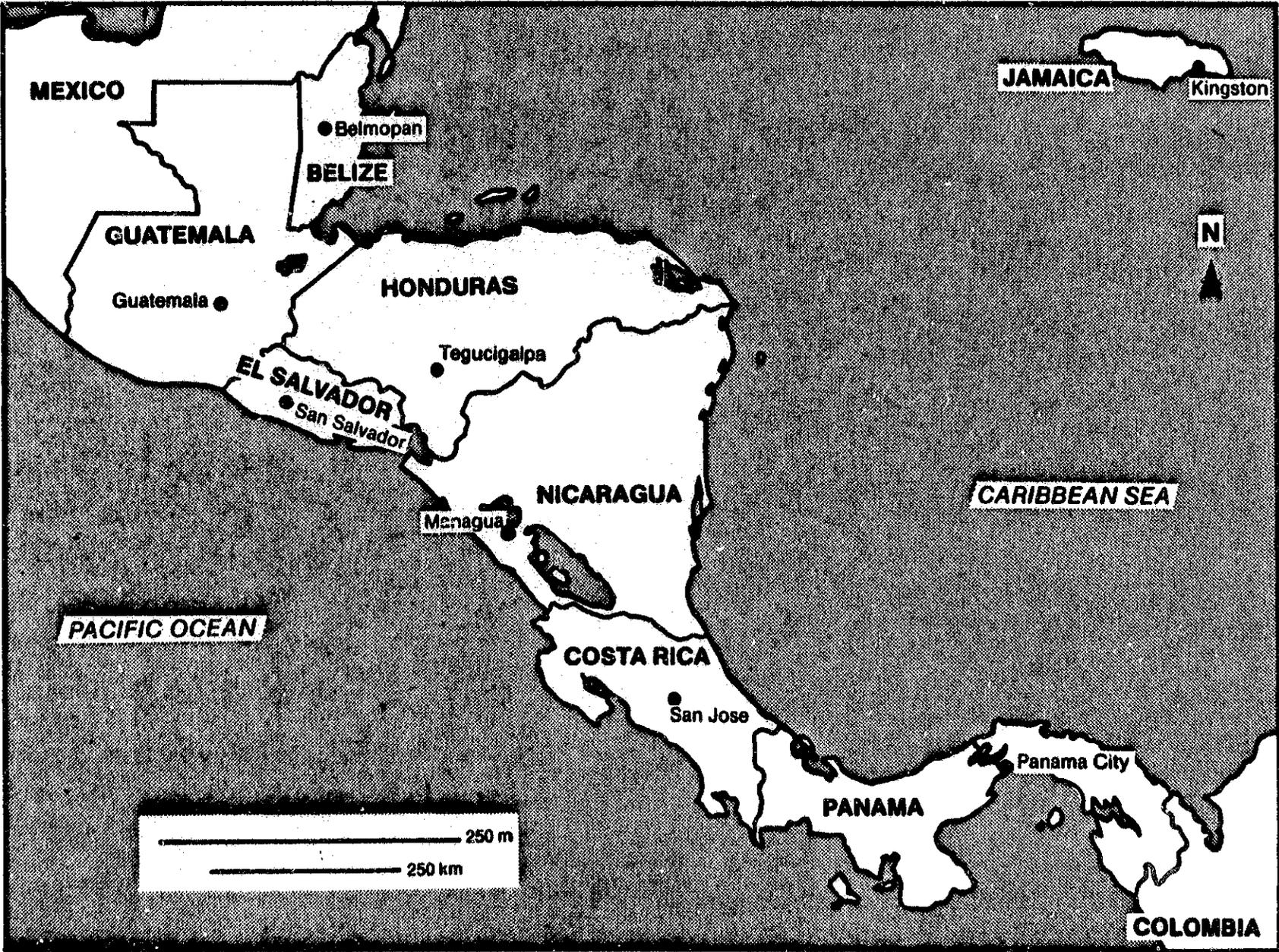
	WATER SUPPLY			SANITATION			TOTAL
	SUBTOTAL	URBAN	RURAL	SUBTOTAL	URBAN	RURAL	
ESTIMATED FUNDING REQUIRED	576,819	281,579	295,240	524,379	461,213	63,166	1,101,198
CURRENT COMMITMENTS *	136,512	30,463	106,049	39,215	16,140	23,074	175,727
DEFICIT	440,308	251,116	189,191	485,164	445,073	40,092	925,472

* Includes only those commitments which will expand coverage to meet the WASH target levels. This pool excludes \$25,377 in funds which exceed the requirements to meet the WASH goals in selected subsectors within two countries. Funding needs for these subsectors have been included as zeros.

WASH's Lessons Learned

Over the past ten years, WASH has seen that multifaceted challenges must be addressed to achieve the desired results of improving access to water and sanitation services. In addition to installing improved facilities, it is important to provide maintenance systems and health and hygiene education, and to address environmental issues. Central America faces a formidable challenge in the water supply and sanitation sector in the 1990s. In order to meet this challenge, the various agencies, institutions, and communities involved in water and sanitation development must form partnerships at both the policy and operational levels, with a long-term commitment to build the systems and the capacity to maintain them.

CENTRAL AMERICA



Chapter 1

INTRODUCTION

1.1 Purpose and Scope

This report, the third annual update of a Water and Sanitation for Health (WASH) Project study of the water and sanitation sector in Central America begun in 1987, has been prepared for the LAC Bureau of the U.S. Agency for International Development. It covers the status of the sector in Belize, Guatemala, Honduras, El Salvador, Costa Rica, and Panama through the end of 1990, and for the first time includes Nicaragua, where A.I.D. has recently become active. Thus, the scope of the study extends to the whole of Central America and Panama.

As in previous years, the report analyzes the current availability of water supply and sanitation services in Central America, assessing ongoing and proposed investments to estimate the funding required to meet specified targets. While the first three reports assessed progress toward the 1989 objectives of the Central American Initiative (developed by the LAC Bureau based on recommendations by the 1984 Bipartisan Commission on Central America), this report tracks progress toward the goals established by WASH in the 1989 study, which is also the basis for 1995 coverage targets established for Nicaragua and Panama.

1.2 Sources

Missions in each of the seven countries and USAID's Regional Housing and Urban Development Office (RHUDO)/Tegucigalpa provided current data on water and sanitation coverage and programs. (The Regional Office for Central America and Panama [ROCAP] is not currently active in the sector.) Other institutions providing information were CARE, the Canadian International Development Agency (CIDA), the German Agency for Technical Cooperation (GTZ), the German Reconstruction Loan Company (KfW), the Inter-American Development Bank (IDB), the Pan American Health Organization (PAHO), the United Nations Children's Fund (UNICEF), and the World Bank.

1.3 Definitional Framework

The definitional framework employed in this report is the same as that used in the previous studies.

1.3.1 Coverage Data

Water and sanitation coverage is a tally of the population with access to at least minimal services, and is expressed either in terms of numbers of persons or as a percentage of the total population. The following definitions are used:

- **Urban and Rural Populations**—Generally speaking, urban areas are defined as population centers of 2,000 or more. (The various country sources of information on population may not have strictly followed this definition.)
- **Water Supply Coverage**—Water supply coverage includes persons with access through a direct connection or from a water system outlet (standpipe or public fountain) within 200 meters of the home. Coverage estimates also count persons served by water vendors.
- **Sanitation Coverage**—Sanitation coverage includes those with an in-house or in-compound sewerage connection, septic tank, or latrine.

The quality of coverage varies with the types of service provided (e.g., direct house connections versus communal standpipes) and may also vary among population centers. For example, some cities have water for only a few hours a day while others have continuous service. It is not possible to mark such distinctions in quality. All persons reported to have coverage are considered to have at least minimal access to the services defined above.

It is important to note, however, that some facilities are inadequate from an environmental standpoint and require upgrading in the long term. Because of this, statistics reported for many countries may exaggerate the number of persons with adequate coverage. Throughout the region, particularly in rural areas, many populations have access only to rudimentary facilities, such as uncovered, poorly constructed latrines and, for water, simple rainfall collection devices. Many population centers receive piped water supplies of poor quality that do not measure up to standards for potable water in developed countries. In many countries, untreated domestic and industrial wastewater is dumped into the rivers and other bodies of water. There is widespread disposal of solid waste in open-cut dumps and on uncultivated land. Human excreta and pesticides contaminate the soil. Water pollution from pesticides also poses a threat to human health. Increasingly, developing water and sanitation facilities will need to be given priority in environmental health in the region.

In several of the countries included, coverage data are based upon assumptions that differ from the definitional framework for this report. Consequently, WASH has had to use its best judgment to bring data into conformity with the definitions outlined above.

1.3.2 Excluded Funds

Only expenditures for projects that expand the number of persons with access to water and sanitation services are included in the investment analysis. Consequently, funding for a number of projects, particularly some of the large loans made by the IDB and the World Bank, have not been included in their entirety. Many of these loan programs support the rehabilitation or upgrading of existing systems or the construction of off-site facilities (indirect-user facilities, such as treatment plants, dams, reservoirs) to improve or sustain existing services. Frequently, these projects do support some system expansion. Therefore, as in the 1989 report, 10 percent of the estimated outstanding disbursements has been considered as funding which supports the extension of coverage.

Non-infrastructure projects, which support institutional development of national and municipal water and sewerage agencies, training in management, operation and maintenance, technology transfer, and health and sanitation education, are also excluded from the funding analysis. These projects are critical and augment water and sanitation services but do not directly provide for service expansion.

Where details of disbursement schedules were not available, WASH has estimated remaining expenditures on the basis of the best available information.

1.3.3 The 1995 Targets

WASH's targets, which establish the minimal coverage to be attained by 1995, were developed in the 1989 update as percentages of urban, rural, and overall populations. They have been extrapolated from a model which projects full coverage in each subsector of each country by 2020. Using this methodology, targets for Nicaragua and Panama are developed in Chapter 2 of this report. For those countries discussed in the 1989 study, the numbers of additional persons to be served in order to meet the targets have changed as a result of population growth rates and current coverage levels.

The WASH targets were not developed with country participation and do not reflect specific country goals. They are intended to assist A.I.D. in tracking the expansion of water and sanitation facilities and focus attention on the investment needed to increase coverage for urban and rural populations in these countries.

1.4 Methodology

The methodology used to determine the funding needed to achieve the targets for 1995 follows the approach established in the previous update.

- Using information from USAID missions in each country, the report updates data on coverage for the four subsectors (urban water, rural water, urban sanitation, and rural sanitation) through the end of 1990.
- The total number of persons targeted for coverage in each subsector in 1995 is calculated by estimating the 1995 population through a simple linear extrapolation (increasing the existing population by the current growth rate for each year between 1990 and 1995). The percentage target for 1995 is then multiplied by the projected population.
- The number of persons with access to services in each subsector in 1990 is then deducted from the number targeted for coverage in 1995 to provide an estimate of the population requiring additional water and sanitation services. For each subsector, the population target is then multiplied by an average per capita unit cost to estimate the total investment needed.
- Finally, the funding shortfall is calculated by subtracting the total commitments for coverage-expanding projects in each subsector from the total investment needed to attain WASH's targets.

1.5 Report Organization

Chapter 2 of this report presents population and coverage data for the region as a whole and for each of the seven countries. It also discusses progress toward attaining the 1995 WASH targets, currently committed investments in each subsector, and shortfalls. Chapter 3 discusses the prospects of attaining these goals. The country profile appendices provide a more detailed analysis of the water and sanitation sector in each country. Each appendix contains tables and figures documenting actual water supply and sanitation coverage and the estimated investment required to meet the 1995 targets.

1.6 Additional Planning Reports

The LAC Bureau plans to continue its annual updates of this Central American study through 1994. Reports on water and sanitation in the Andean countries of Bolivia, Ecuador, and Peru, and the Caribbean countries of Barbados, the Dominican Republic, Grenada, Haiti, and Jamaica, are also available. These two regional reports, produced for the first time in 1989, will also be updated annually through 1994.

Chapter 2

WATER SUPPLY AND SANITATION UPDATE IN CENTRAL AMERICA

2.1 Introduction

With the incorporation of both Nicaragua and Panama (excluded in the 1990 report), the regional summaries included in this update provide an assessment of all of Central America. The exclusion of one or both of these countries must be taken into account in comparing this document with earlier reports.

Much of the information provided by the USAID missions and offices was obtained directly from national sources—water and sewerage agencies, coordinating committees, and census bureaus. In those instances where the reported coverage or population figures were not in conformity with the definitional framework of this report, WASH made the best adjustments it could. Further discussion of these adjustments occurs in the country profiles in the appendices.

2.2 Access to Water and Sanitation Services in 1990

In 1990, access to water supply services in the region ranged from a low of 48 percent in El Salvador (followed closely by 49 percent in Nicaragua) to a high of 95 percent in Costa Rica. Coverage for sanitation services ranged from a low of 24 percent in Nicaragua to 98 percent of the population in Costa Rica. Coverage for each country, as well as data for the region as a whole, is provided in Tables 1 and 2. (Tables and figures appear at the end of the chapter.) Coverage is illustrated graphically in Figure 1. Overall, an estimated 62 percent of the 29 million inhabitants of Central America and Panama had access to drinking water (Table 1), and 60 percent had access to sanitation (Table 2).

Throughout the region, 87 percent of urban residents had access to a water supply service and 75 percent had access to sanitary systems (Figure 2, Tables 1 and 2). Of the total estimated urban population of 13.7 million, 11.9 million had water services, and 10.2 million had sanitation services. Since 1984, the baseline for this study, 3.6 million individuals in urban locales have gained access to sanitation facilities, and 3.1 million have gained access to water service. During this period, regional coverage in urban water services has grown from 81 percent to 87 percent and sanitation coverage from 60 percent to 75 percent.

The disparity between urban and rural services has remained virtually unchanged during the decade. Throughout the 1980s, approximately four out of five urban residents but fewer than two out of five rural residents had access to drinking water. Urban sanitation coverage, which

was 22 percent higher than rural coverage in 1980 and 21 percent higher in 1984, is now 28 percent higher. In water, the difference between urban and rural coverage has remained at 48 percent in 1990 as in 1980, having dropped to 45 percent in 1984.

In 1990, only 39 percent of rural dwellers in the region (623,000 more than in 1984) had access to a water system, and 47 percent (an increase of 1,354,000 over 1984) had access to sanitation facilities. Since 1980, 2.9 million additional rural inhabitants have gained access to sanitation facilities and 1.4 million to water. With these advances, while coverage for rural water supplies has increased by only 3 points since 1984 (36 percent) and by only 4 points since 1980 (35 percent), sanitation coverage has increased by 8 points (from 39 percent) and 15 points (from 32 percent) respectively.

As indicated by these trends, gains in sanitation services have substantially outpaced increases in access to water services. In five of the seven countries, sanitation coverage among rural populations is higher than water coverage. According to UNICEF, the notable gains in sanitation are the result of major programs for installing low-cost latrines in all Central American countries.

Disparities in coverage among the countries in 1990 were similar to those reported previously. Water supply and sanitation services for each country are illustrated in Figures 3 and 4. In the water sector, Belize, Costa Rica, and Panama provided coverage of 75 percent or more, whereas El Salvador and Nicaragua had a coverage of less than 50 percent. Honduras and Guatemala, with 69 percent and 56 percent, provided moderate access to water facilities. In sanitation, Belize, Guatemala, and Nicaragua provided low overall coverage (less than 50 percent). Panama and Nicaragua provided services to more than 80 percent of their populations. At 63 percent and 73 percent coverage respectively, El Salvador and Honduras remained at an intermediate level.

2.3 1995 WASH Targets

With the expiration of the timeframe for attaining the goals set under the Central American Initiative, WASH developed new targets in the 1989 update. These are percentage goals for urban and rural populations in each country with access to water services and at least basic sanitation facilities, and will be affected by changes in population over the next six years. They are estimates of the progress required by 1995 if full coverage in both water and sanitation services is to be achieved by 2020. These targets do not necessarily reflect each country's current development plans for the sector. Targets for Nicaragua and Panama have been established for the first time in this update. Sanitation coverage objectives for Guatemala have been revised to reflect data provided by the mission. The incorporation of these new country goals has altered the regional targets established in the previous report.

WASH's targets for each country and for the region as a whole are shown in Tables 3 and 4. Figures 5 and 6 illustrate the difference between current coverage and coverage targets

for each country. Regional targets for water coverage (Table 3) are now 89 percent for urban areas and 51 percent for rural populations, which results in an overall goal of 70 percent. The sanitation goals (Table 4) are 57 percent for rural areas, 81 percent for urban areas, and 68 percent for both population groups.

These targets seek to raise regional water coverage from 62 percent in 1990 to 70 percent in 1995, and sanitation coverage from 60 percent to 68 percent. Based on current population trends in each country, approximately 5.4 million more persons will require access to water and 5.5 million to sanitation. Tables 3 and 4 compare 1990 coverage with the 1995 targets for each subsector. The number of additional persons to be served in each country and in the region is shown in Table 5. Guatemala, the most populous country in the region, will require the largest number of new facilities and connections to meet the WASH goals.

2.4 Funding Requirements

Funding to meet the 1995 targets was calculated by multiplying the estimated number of additional persons needing coverage in each country (Table 5) by the per capita cost of providing services. Unit costs are based on figures developed by PAHO. They have been increased each year by a small factor to account for inflation and are 5 percent over figures used last year. Unit costs for each country are shown in Table 3 in the country profile appendices. WASH's estimate of total funding is shown in Table 6. Investment requirements for the region are shown graphically in Figure 7, which illustrates WASH's estimates of funding needs for each subsector.

Required regional investments in urban water are nearly \$282 million, which, added to an estimated \$295 million for rural water, make a total of \$577 million. A similar resource commitment is needed in sanitation, with \$461 million required to meet urban coverage goals and \$63 million for rural areas.

The disparity in costs to meet urban targets (\$743 million) and rural targets (\$358 million) is, in part, a consequence of heavy urbanization throughout the region. However, it is also a result of differences in per capita costs, which can be calculated by dividing the total investment required (Table 6) by the number of persons to be covered (Table 5). At an average rate of \$168 per person, the cost of extending urban sanitation services is by far the highest. Expanding rural sanitation services, estimated at a per capita cost of only \$23, is less than one-seventh the cost of expanding urban sanitation and less than one-fourth the cost of expanding urban or rural water. This is explained by the widespread installation of latrines rather than sewerage services in rural areas. The cost of extending urban and rural water services is estimated to be \$113 and \$103 per capita respectively. This difference is probably a significant factor in the rapid gains made in rural sanitation during the 1980s.

2.5 Funding Commitments and Shortfalls

WASH's estimates of current funding commitments are shown by country and for the region in Table 6. They include only investments in facilities to extend coverage to persons currently unserved by basic water or sanitation services. As explained earlier, many of the projects currently operating in the sector—particularly large urban development projects financed by the World Bank and the IDB—contribute only partially to increasing coverage. Only 10 percent of the funding for such projects was considered to be allocated to increasing coverage. Current commitments to expand coverage in the 1990-1995 period total approximately \$201 million. A breakdown of funding by donor is provided below.

A.I.D.	\$75,337
CARE	\$239
CIDA	\$11,600
EEC	\$20,000
GTZ	\$0
IDB	\$40,886
Italian Government	\$0
JICA	\$6,000
KFW	\$29,067
Swiss Government	\$1,850
UNICEF	\$14,805
World Bank	\$1,000
TOTAL	\$200,784

The additional investment needed is calculated by subtracting the amounts currently committed from the total estimated cost to achieve the targets and is shown in Figure 7. Funding shortfalls for each country are presented in Figure 8.

The funding needed to increase access to water supplies is approximately \$1.1 billion for the region as a whole (Table 6). Only about 18 percent of this is currently committed, with less than 6 percent of what is needed for urban development and 42 percent for rural development. Investment needs for three of the four subsectors are: \$251 million for urban water; \$189 million for rural water; and \$40 million for rural sanitation. Urban sanitation, the subsector with the largest investment requirement, is also the one with the lowest commitment; \$445 million in additional funding—nearly half of the total requirement—is needed over the next five years to meet the WASH target. The total additional investment required is shown in Table 7.

**CENTRAL AMERICA AND PANAMA
REGIONAL COVERAGE:
1984 AND 1990**

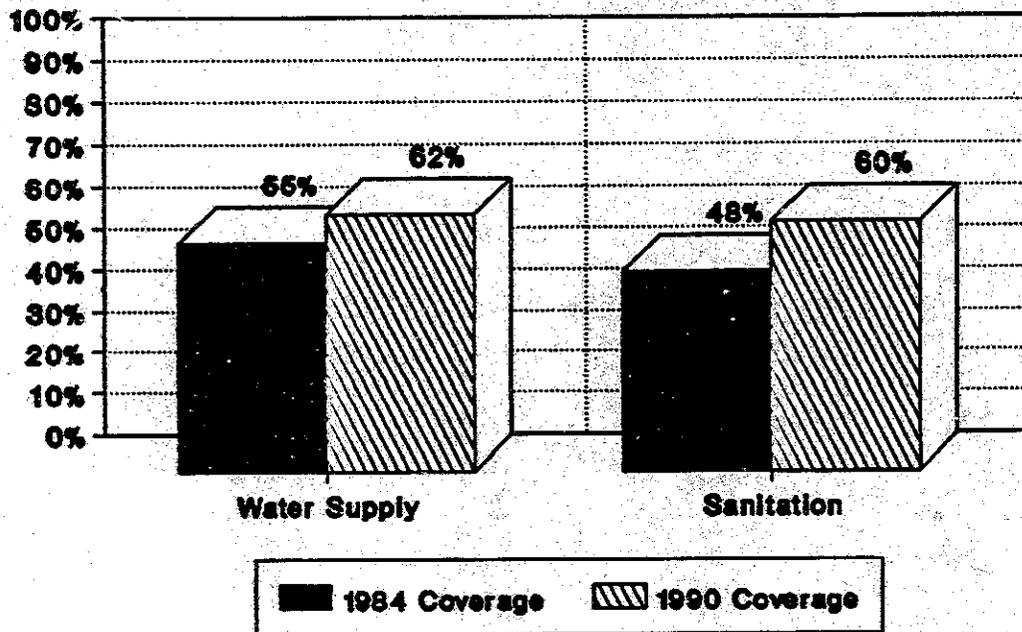


Figure 1

CENTRAL AMERICA AND PANAMA RURAL VS. URBAN COVERAGE: 1984 AND 1990

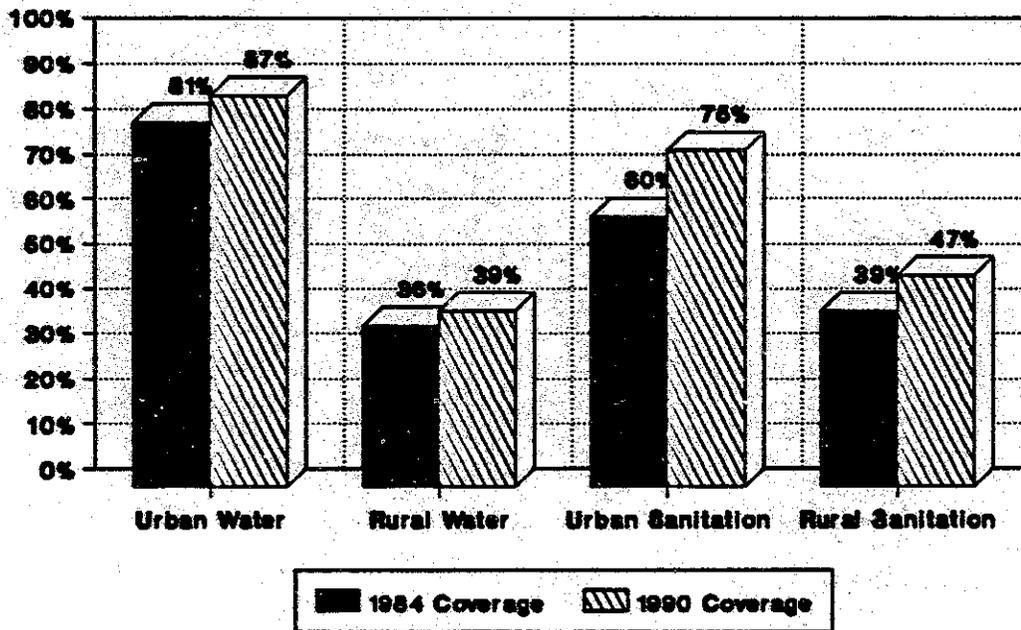
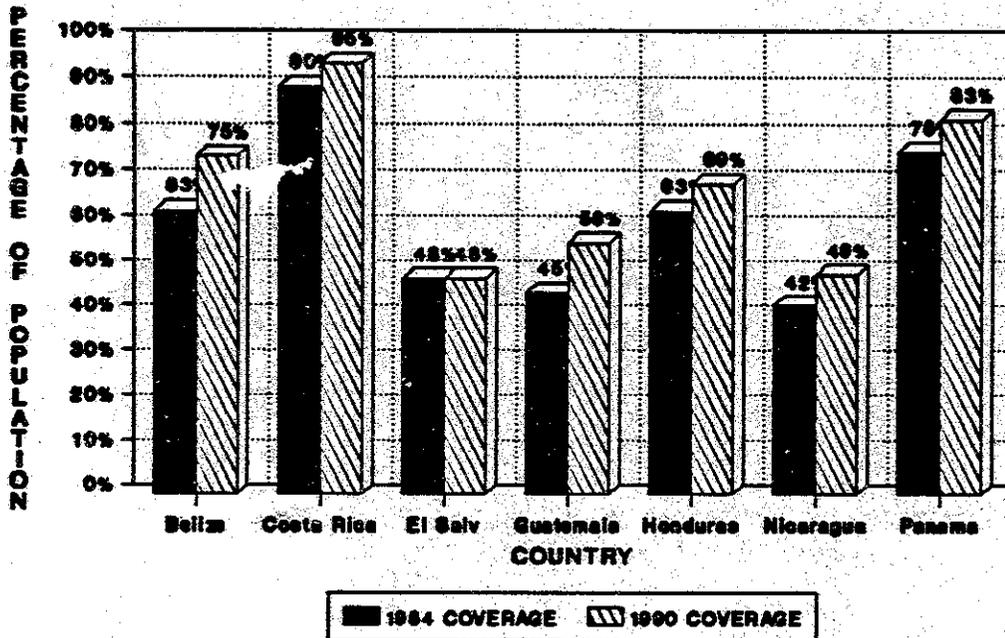


Figure 2

1984 AND 1990 WATER SUPPLY COVERAGE (COMBINED URBAN AND RURAL)



1985 and 1990 data provided for Nicaragua

Figure 3

1984 AND 1990 SANITATION COVERAGE (COMBINED URBAN AND RURAL)

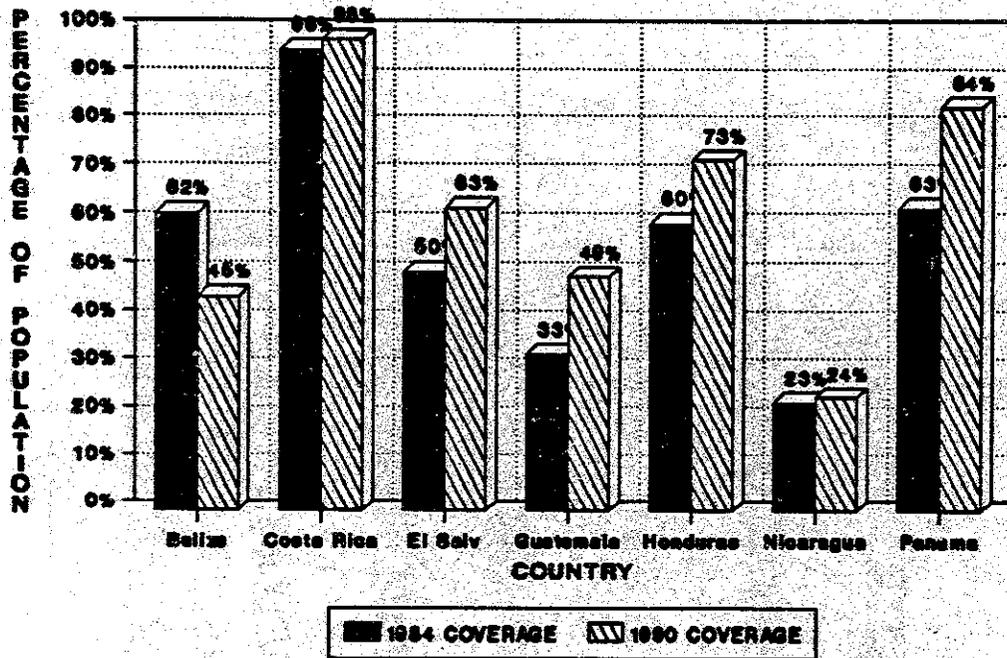


Figure 4

1990 WATER COVERAGE VS. 1995 TARGETS (COMBINED URBAN AND RURAL)

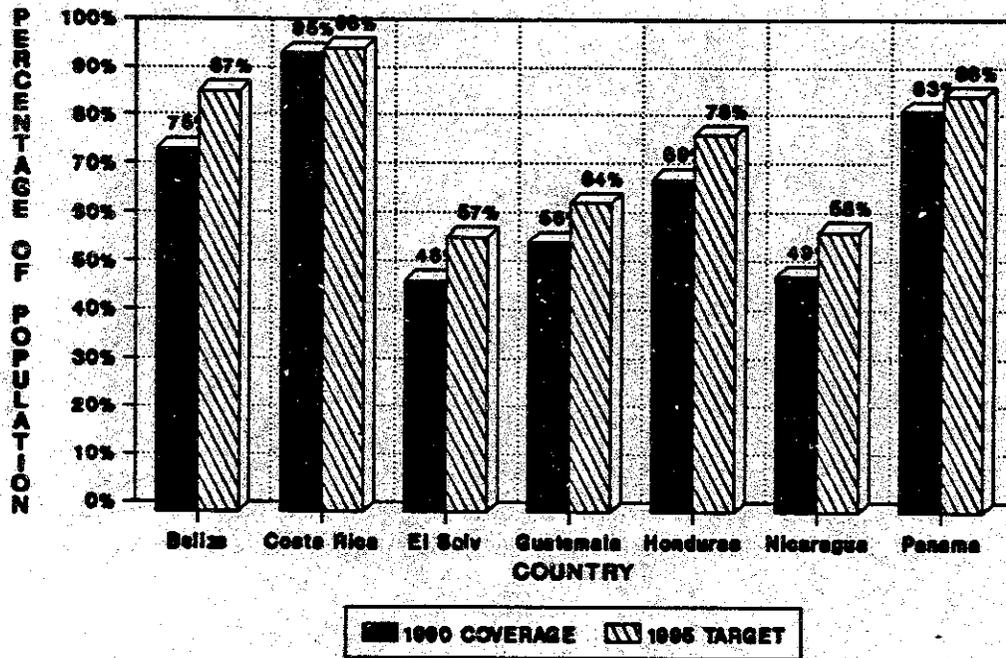


Figure 5

1990 SANITATION COVERAGE VS. 1995 TARGETS (COMBINED URBAN AND RURAL)

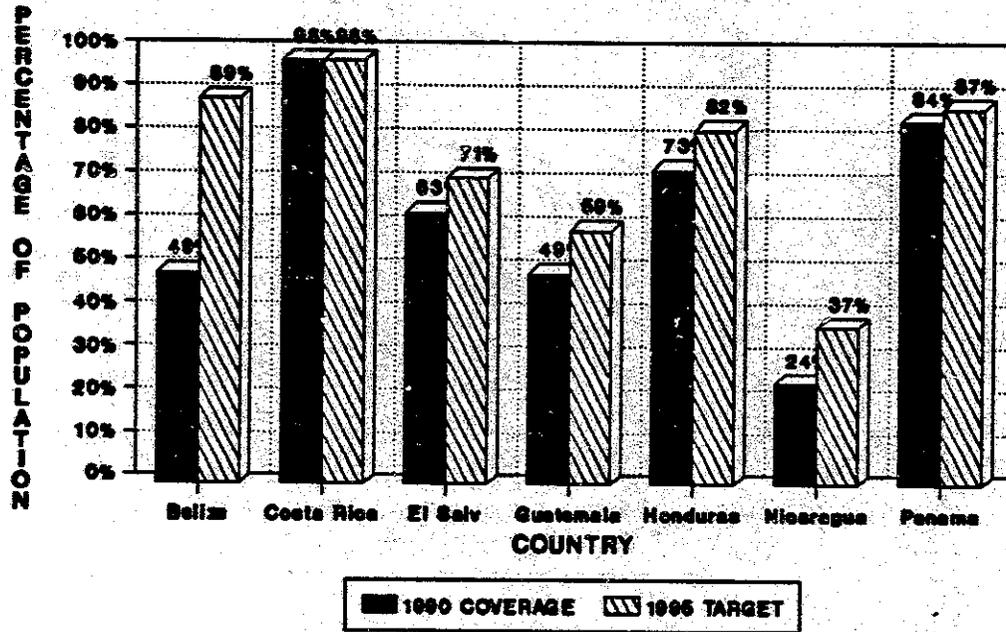


Figure 6

CENTRAL AMERICA AND PANAMA TOTAL INVESTMENT TO MEET 1995 TARGETS

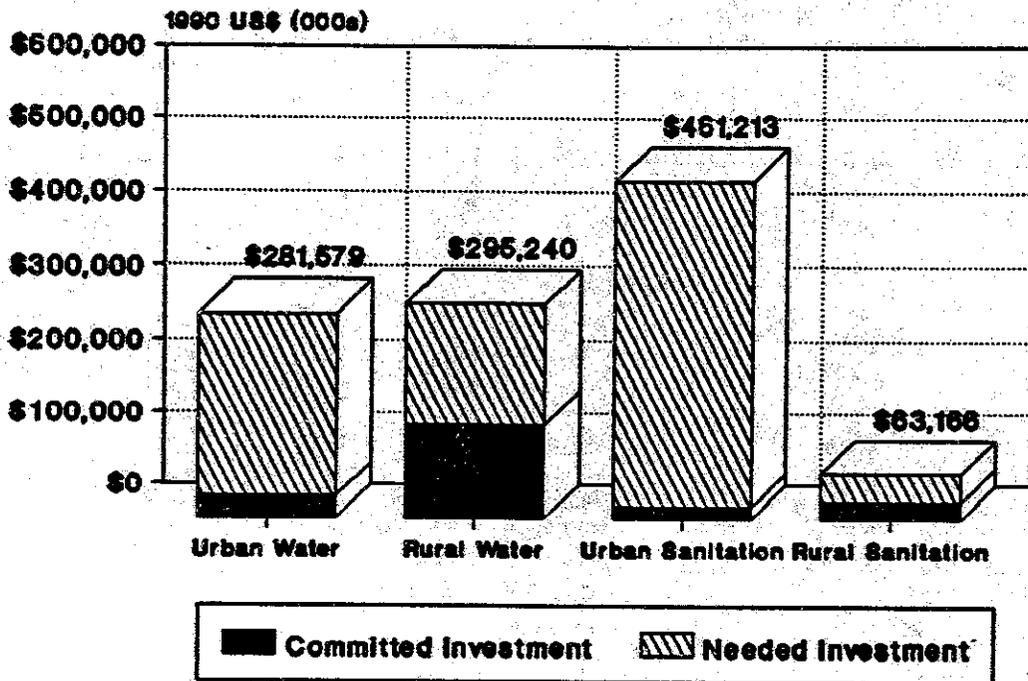


Figure 7

ESTIMATED FUNDING SHORTFALL (URBAN AND RURAL)

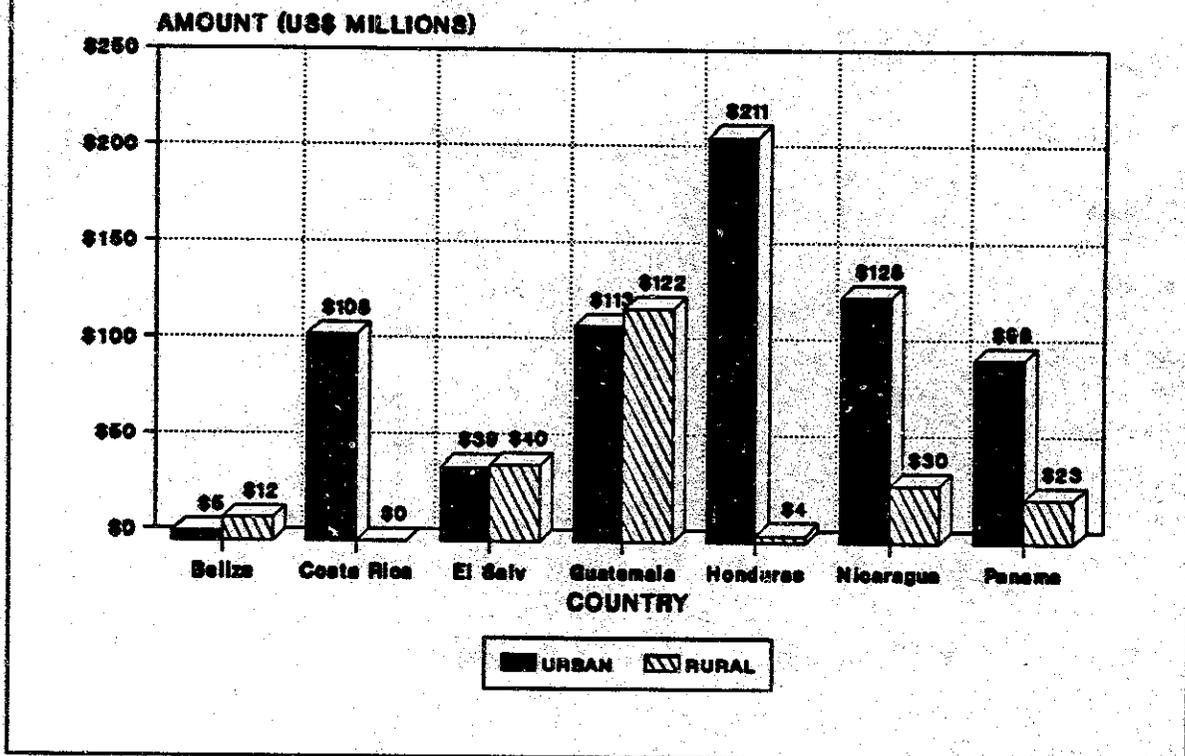


Figure 8

TABLE 1

Water Supply Coverage: 1980 and 1990 Coverage Levels

WATER SUPPLY										
COUNTRY	YEAR	ALL AREAS			URBAN AREAS			RURAL AREAS		
		TOTAL POPUL.	POPUL. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POPUL. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POPUL. SERVED	% OF POP. SERVED
BELIZE	1980	146	99	68%	73	71	97%	73	28	38%
	1984	156	98	63%	78	71	91%	78	27	35%
	1990	184	138	75%	97	92	95%	87	46	53%
COSTA RICA	1980	2,210	1,960	89%	1,025	1,025	100%	1,185	935	79%
	1984	2,405	2,154	90%	1,070	1,059	99%	1,335	1,095	82%
	1990	3,015	2,859	95%	1,832	1,832	100%	1,183	1,027	87%
EL SALVADOR	1980	4,540	2,330	51%	1,900	1,280	67%	2,640	1,050	40%
	1984	4,760	2,261	48%	1,980	1,445	73%	2,720	816	30%
	1990	5,200	2,500	48%	2,550	2,150	84%	2,650	350	13%
GUATEMALA	1980	7,000	3,200	46%	2,700	2,400	89%	4,300	800	19%
	1984	7,800	3,500	45%	3,100	2,300	74%	4,700	1,200	26%
	1990	9,197	5,121	56%	3,771	3,462	92%	5,426	1,659	31%
HONDURAS	1980	3,754	2,226	59%	1,368	1,272	93%	2,386	954	40%
	1984	4,299	2,726	63%	1,700	1,405	83%	2,599	1,321	51%
	1990	4,771	3,282	69%	1,948	1,628	84%	2,823	1,654	59%
NICARAGUA	1980	2,746	1,094	40%	1,533	1,002	65%	1,213	92	8%
	* 1985	3,959	1,660	42%	1,884	1,432	76%	2,075	228	11%
	1990	3,917	1,931	49%	2,319	1,645	71%	1,598	286	18%
PANAMA	1980	1,977	1,527	77%	1,003	913	91%	974	614	63%
	1980	2,157	1,643	76%	1,127	1,116	99%	1,030	527	51%
	1990	2,315	1,920	83%	1,208	1,105	91%	1,107	815	74%
TOTAL	1980	22,373	12,436	56%	9,602	7,963	83%	12,771	4,473	35%
	1984	25,476	14,042	55%	10,939	8,828	81%	14,537	5,214	36%
	1990	28,599	17,751	62%	13,725	11,914	87%	14,874	5,837	39%

Population figures are rounded to the nearest thousand.

* Data for Nicaragua reflects 1985 coverage figures.

TABLE 2

Sanitation Coverage: 1980 and 1990 Coverage Levels

SANITATION										
COUNTRY	YEAR	ALL AREAS			URBAN AREAS			RURAL AREAS		
		TOTAL POPUL.	POPUL. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POPUL. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POPUL. SERVED	% OF POP. SERVED
BELIZE	1980	146	96	66%	73	43	59%	73	53	73%
	1984	156	97	62%	78	48	62%	78	49	63%
	1990	184	82	45%	97	64	66%	87	18	21%
COSTA RICA	1980	2,210	2,044	92%	1,025	1,016	99%	1,185	1,028	87%
	1984	2,405	2,319	96%	1,070	1,059	99%	1,335	1,260	94%
	1990	3,015	2,947	98%	1,832	1,832	100%	1,183	1,115	94%
EL SALVADOR	1980	4,540	1,600	35%	1,900	910	48%	2,640	690	26%
	1984	4,700	2,355	50%	1,980	1,485	75%	2,720	870	32%
	1990	5,200	3,299	63%	2,550	2,228	87%	2,650	1,071	40%
GUATEMALA	1980	7,000	2,100	30%	2,700	1,200	44%	4,300	900	21%
	1984	7,800	2,600	33%	3,100	1,300	42%	4,700	1,300	28%
	1990	9,197	4,506	49%	3,771	2,715	72%	5,426	1,791	33%
HONDURAS	1980	3,754	1,290	34%	1,368	670	49%	2,386	620	26%
	1984	4,299	2,560	60%	1,700	1,349	79%	2,599	1,211	47%
	1990	4,771	3,478	73%	1,948	1,599	82%	2,823	1,879	67%
NICARAGUA	1980	2,746	942	34%	1,533	700	46%	1,213	242	20%
	* 1985	3,959	901	23%	1,884	659	35%	2,075	242	12%
	1990	3,917	942	24%	2,319	700	30%	1,598	242	15%
PANAMA	1980	1,977	1,225	62%	1,003	650	65%	974	575	59%
	1984	2,157	1,367	63%	1,127	687	61%	1,030	680	66%
	1990	2,315	1,944	84%	1,208	1,094	91%	1,107	850	77%
TOTAL	1980	22,373	9,297	42%	9,602	5,189	54%	12,771	4,108	32%
	1984	25,476	12,199	48%	10,939	6,587	60%	14,537	5,612	39%
	1990	28,599	17,198	60%	13,725	10,232	75%	14,874	6,966	47%

Population figures are rounded to the nearest thousand.

* Data for Nicaragua reflect 1985 coverage figures.

TABLE 3

Water Supply Coverage: 1990 Coverage Levels vs. 1995 Targets

WATER SUPPLY										
COUNTRY	YEAR	ALL AREAS			URBAN AREAS			RURAL AREAS		
		TOTAL POPUL.	POPUL. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POPUL. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POPUL. SERVED	% OF POP. SERVED
BELIZE	1990	184	138	75%	97	92	95%	87	46	53%
	1995	214	187	87%	112	104	93%	102	82	81%
COSTA RICA	1990	3,015	2,859	95%	1,832	1,832	100%	1,183	1,027	87%
	1995	3,424	3,279	96%	2,211	2,211	100%	1,213	1,067	88%
EL SALVADOR	1990	5,200	2,500	48%	2,550	2,150	84%	2,650	350	13%
	1995	5,932	3,400	57%	2,815	2,309	82%	3,117	1,091	35%
GUATEMALA	1990	9,197	5,121	56%	3,771	3,462	92%	5,426	1,659	31%
	1995	10,662	6,846	64%	4,372	4,079	93%	6,290	2,768	44%
HONDURAS	1990	4,771	3,282	69%	1,948	1,628	84%	2,823	1,654	59%
	1995	5,653	4,424	78%	2,474	2,326	94%	3,178	2,098	66%
NICARAGUA	1990	3,917	1,931	49%	2,319	1,645	71%	1,598	286	18%
	1995	4,585	2,651	58%	2,715	2,058	76%	1,871	593	32%
PANAMA	1990	2,315	1,920	83%	1,208	1,105	91%	1,107	815	74%
	1995	2,710	2,324	86%	1,414	1,314	93%	1,296	1,011	78%
TOTAL	1990	28,599	17,751	62%	13,725	11,914	87%	14,874	5,837	39%
	1995	35,180	23,110	70%	16,113	14,400	89%	17,067	8,710	51%

Population figures are rounded to the nearest thousand.

TABLE 4

Sanitation Coverage: 1990 Coverage Levels vs. 1995 Targets

SANITATION										
COUNTRY	YEAR	ALL AREAS			URBAN AREAS			RURAL AREAS		
		TOTAL POPUL.	POPUL. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POPUL. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POPUL. SERVED	% OF POP. SERVED
BELIZE	1990	184	82	45%	97	64	66%	87	18	21%
	1995	214	190	89%	112	105	93%	102	85	84%
COSTA RICA	1990	3,015	2,947	98%	1,832	1,832	100%	1,183	1,115	94%
	1995	3,424	3,364	98%	2,211	2,211	100%	1,213	1,152	95%
EL SALVADOR	1990	5,200	3,299	63%	2,550	2,228	87%	2,650	1,071	40%
	1995	5,932	4,211	71%	2,815	2,590	92%	3,117	1,621	52%
GUATEMALA	1990	9,197	4,506	49%	3,771	2,715	72%	5,426	1,791	33%
	1995	10,662	6,251	59%	4,372	3,357	77%	6,290	2,894	46%
HONDURAS	1990	4,771	3,478	73%	1,948	1,599	82%	2,823	1,879	67%
	1995	5,653	4,628	82%	2,474	2,276	92%	3,178	2,352	74%
NICARAGUA	1990	3,917	942	24%	2,319	700	30%	1,598	242	15%
	1995	4,585	1,678	37%	2,715	1,132	42%	1,871	546	29%
PANAMA	1990	2,315	1,944	84%	1,208	1,094	91%	1,107	850	77%
	1995	2,710	2,348	87%	1,414	1,302	92%	1,296	1,046	81%
TOTAL	1990	28,599	17,198	60%	13,725	10,232	75%	14,874	6,966	47%
	1995	33,180	22,670	68%	16,113	12,973	81%	17,067	9,697	57%

Population figures are rounded to the nearest thousand.

TABLE 5

Increase over 1990 Coverage Levels Required to Meet 1995 Targets
(Number of Persons to be Served—000s)

COUNTRY	WATER SUPPLY			SANITATION		
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL
BELIZE	48	12	36	108	41	67
COSTA RICA	419	379	40	416	379	37
EL SALVADOR	900	159	741	912	362	550
GUATEMALA	1,726	617	1,109	1,745	642	1,103
HONDURAS	1,142	698	444	1,150	677	473
NICARAGUA	720	413	307	736	432	304
PANAMA	405	209	196	404	208	196
TOTAL	5,360	2,487	2,873	5,471	2,741	2,730

Population figures are rounded to the nearest thousand.

TABLE 6

**Estimated Funding Needed to Meet 1995 Targets
(1990 US \$000s)**

COUNTRY	WATER SUPPLY			SANTATION			TOTAL
	SUBTOTAL	URBAN	RURAL	SUBTOTAL	URBAN	RURAL	
BELIZE—MEET 1995 GOALS	\$7,488	1,872	5,616	11,124	4,223	6,901	18,612
COMMITTED FUNDING	\$1,418	724	694	933	476	457	2,351
REQUIRED INVESTMENT	\$6,070	1,148	4,922	10,191	3,747	6,444	16,261
COSTA RICA—MEET 1995 GOALS	\$58,515	54,955	3,560	57,655	56,471	1,184	116,170
COMMITTED FUNDING	\$7,818	1,875	5,943	3,782	1,825	1,957	11,600
REQUIRED INVESTMENT	\$53,080	53,080	(2,383)	54,646	54,646	(773)	107,726
EL SALVADOR—MEET 1995 GOALS	\$101,823	30,687	71,136	39,208	30,408	8,800	141,031
COMMITTED FUNDING	\$49,997	15,845	34,153	12,188	6,497	5,690	62,185
REQUIRED INVESTMENT	\$51,826	14,842	36,983	27,020	23,911	3,110	78,846
GUATEMALA—MEET 1995 GOALS	\$185,525	52,445	133,080	78,819	62,274	16,545	264,344
COMMITTED FUNDING	\$25,495	934	24,561	4,044	1,066	2,978	29,539
REQUIRED INVESTMENT	\$160,030	51,511	108,519	74,775	61,208	13,567	234,805
HONDURAS—MEET 1995 GOALS	\$105,002	67,706	37,296	170,985	157,741	13,244	275,987
COMMITTED FUNDING	\$70,515	10,998	59,517	15,913	6,113	9,800	86,428
REQUIRED INVESTMENT	\$56,708	56,708	(22,221)	155,072	151,628	3,444	211,780
NICARAGUA—MEET 1995 GOALS	\$65,034	40,474	24,560	100,464	87,696	12,768	165,498
COMMITTED FUNDING	\$5,574	0	5,574	2,926	0	2,926	8,500
REQUIRED INVESTMENT	\$59,460	40,474	18,986	97,538	87,696	9,842	156,998
PANAMA—MEET 1995 GOALS	\$53,432	33,440	19,992	66,124	62,400	3,724	119,556
COMMITTED FUNDING	\$298	87	211	202	163	39	500
REQUIRED INVESTMENT	\$53,134	33,353	19,781	65,922	62,237	3,685	119,056
TOTAL TO MEET 1995 GOALS	\$576,819	281,579	295,240	524,379	461,213	63,166	1,101,198
* COMMITTED FUNDING	\$161,116	30,463	130,653	39,998	16,140	23,847	201,104
REQUIRED INVESTMENT	\$440,308	251,116	189,191	485,164	445,073	40,092	925,472

* Includes \$25,377 in "excess" funding in the following sectors: Costa Rica—rural water = \$2,383 & rural sanitation = \$773; Honduras—rural water = \$22,221. These "excess" commitments have been excluded from the total required investments, because it cannot be assumed that these funds will be transferred to other subsectors.

TABLE 7**Estimated Funding Shortfall to Meet 1995 Targets
(1990 US \$000s)**

COUNTRY	URBAN AREAS			RURAL AREAS			OVERALL
	SUBTOTAL	WATER	SANITATION	SUBTOTAL	WATER	SANITATION	
BELIZE	\$4,895	1,148	3,747	11,366	4,922	6,444	16,261
COSTA RICA	\$107,726	53,080	54,646	0	0	0	107,726
EL SALVADOR	\$38,752	14,842	23,911	40,093	36,983	3,110	78,846
GUATEMALA	\$112,719	51,511	61,208	122,086	108,519	13,567	234,805
HONDURAS	\$208,336	56,708	151,628	3,444	0	3,444	211,780
NICARAGUA	\$128,170	40,474	87,696	28,823	18,986	9,842	156,998
PANAMA	\$95,590	33,353	62,237	23,466	19,781	3,685	119,056
TOTAL	\$ 696,188	251,116	445,073	229,283	189,191	40,092	925,472

"Excess" funding in Costa Rica and Honduras is represented as 0.

CONCLUSIONS

3.1 Introduction

The prospects for meeting the 1995 goals vary substantially from country to country because of differences in both current water and sanitation coverage and the funding already committed. Several countries need relatively small investments to attain the 1995 WASH targets but face shortfalls if insufficient resources are committed. (This analysis includes only external donations and national counterpart funds for externally financed projects.) This chapter will discuss the required increases in coverage for each country and the funding levels required to meet the targets.

3.2 Meeting the 1995 Country Targets

3.2.1 Belize

The 1995 WASH targets for Belize require an increase of 12 percent—from 75 percent to 87 percent—in water supply coverage and 44 percent—from 45 percent to 89 percent—in sanitation coverage. This translates into an increase of 49,000 persons with access to water and 108,000 with access to sanitation facilities. In urban areas, water supply coverage (at 95 percent) has already exceeded the 1995 target of 93 percent coverage, while a 27 percent increase is required to reach the 93 percent sanitation coverage goal. Rural water will require a gain of 28 percent to reach the goal of 81 percent coverage, while rural sanitation must be increased by 63 percent to attain the 1995 goal of 84 percent.

Only three external agencies currently are active in the water and sanitation sector. CIDA plans to terminate its assistance in 1992, and A.I.D. will continue to provide assistance until 1993 but will focus primarily on institutional strengthening. UNICEF plans to continue to work in rural areas over the next five years but will also focus on institutional development; the level of funding committed to extending water and sanitation services will be minimal. A total of \$18.6 million will be necessary to meet the WASH targets. With \$1.2 million in commitments to service expansion in urban areas and another \$1.2 million in rural areas, Belize faces an overall deficit of more than \$16 million. Just over 10 percent of the necessary funding is currently in place; without substantial additional inputs Belize will be unable to meet the targets.

3.2.2 Costa Rica

Costa Rica, with the highest coverage in the region, will require relatively small increases to achieve its 1995 WASH targets. With 100 percent coverage in urban water and sanitation, it has already met the urban targets but will require sufficient investments to keep pace with urban population growth. A 1 percent increase, from 87 percent to 88 percent, will be necessary to meet the targets for rural water, and similarly, to attain the 95 percent target for rural sanitation. With continued population expansion, however, the country will need substantial resources to sustain these high levels of coverage.

Less than \$12 million in external assistance has been committed to expanding water and sanitation services in Costa Rica over the next five years. Commitments for rural regions are sufficient to meet the WASH targets; however, the country faces a shortfall of \$108 million to meet the targets for urban areas. Although a number of large water and sanitation projects are ongoing or planned, most of the funding has been allocated for upgrading and rehabilitating existing systems rather than for expansion.

3.2.3 El Salvador

Current coverage levels in El Salvador are among the lowest in the region, and large increases are required to meet the targets for 1995. Overall, El Salvador must raise access to water services from 48 percent to 57 percent and access to sanitation services from 63 percent to 71 percent. At current population growth rates, this calls for water services for 900,000 and sanitation services for 912,000 more people. Required increases broken down into subsectors are: rural water from 13 percent to 35 percent, urban sanitation from 87 percent to 92 percent, and rural sanitation from 40 percent to 52 percent. While the percentage of urban population with water coverage will drop from 84 to 82 percent to meet the targets, the number of persons having water coverage will increase by 159,000.

Of the \$141 million required to meet the 1995 WASH targets, an estimated \$62 million has been committed in 1990. Consequently, El Salvador's deficit is relatively small: \$39 million for urban and \$40 million for rural development over the next five years. Because of the method used for developing WASH targets (extrapolation based on linear progress toward full coverage by 2020), the targets for rural El Salvador, where current coverage is extremely low, are relatively low. If the nation is to attain more satisfactory levels of coverage, investments beyond those necessary for the five-year goals must be committed to the sector.

3.2.4 Guatemala

Of all the nations included in this study, Guatemala faces the largest shortfall in funding. To meet the goals for the water sector, it will need an increase of 8 percent, or 1,725,000 persons, and for sanitation, an increase of 10 percent, or 1,745,000 persons. Current

commitments of about \$30 million provide less than 12 percent of the \$264 million required.

Despite substantial commitments to expand services in rural areas, a shortfall of \$122 million exists. In the urban sector, where minimal funding has been committed, Guatemala faces a shortfall of \$113 million. At the time of this writing, it was in the process of negotiating repayment schedules for its loans from the IDB and the World Bank which have fallen into arrears. If this situation is resolved in early 1991, Guatemala could receive substantial loan financing for water and sanitation development from the IDB and the IBRD, which have suspended loan programs in the country.

3.2.5 Honduras

The 1995 targets for Honduras will require raising overall water coverage from 69 percent, or 3.3 million persons, to 78 percent, or 4.4 million persons. Targets for sanitation involve increases from 73 percent to 82 percent, or from 3.5 to 4.6 million persons.

Honduras, with commitments of \$86 million to expand water and sanitation services in the next five years, has the greatest level of committed funds, yet faces the second highest funding shortfall in the region, behind Guatemala. This is largely the result of high population growth rates (4.9 percent in urban areas, the highest in the region) and relatively high unit costs for constructing new facilities. Although sufficient funds are available to meet the targets for rural water with a relatively small deficit for rural sanitation, funding committed to the urban sector is primarily for upgrading and rehabilitation rather than for expansion and falls far short of the \$225 million needed to meet the 1995 objectives. WASH has estimated that only \$17 million has been committed to extending urban sector services, resulting in a shortfall of \$208 million.

3.2.6 Nicaragua

Nicaragua's 1995 targets for the urban sector call for increases of 5 percentage points in water coverage to reach 76 percent and 12 points in urban sanitation to reach 42 percent. Rural targets have been established at 32 percent for rural water (from 18 percent in 1990) and 29 percent for rural sanitation (from 15 percent). Though these targets are relatively low, they will be difficult to attain, as Nicaragua has little funding committed to the water and sanitation sector. Currently, no monies have been allocated to support urban development, and a total of \$8.5 million has been provided to support rural regions. At current population growth rates, Nicaragua's targets will require providing water to 720,000 persons more, and sanitation facilities to 736,000 more, at an estimated cost of \$165 million.

Overall, Nicaragua faces a deficit of \$157 million. Given the steady improvements in the political climate and the decline in internal violence, Nicaragua's prospects for commitments from external agencies are good. USAID and the KfW, which plan to provide future support

in the sector, may be key sources of additional financing. The size of the deficit suggests, however, that Nicaragua will find it difficult to reach the target coverage levels.

3.2.7 Panama

The WASH targets for Panama seek relatively modest increases in coverage: from 91 percent to 93 percent for urban water; from 91 percent to 92 percent for urban sanitation; from 74 percent to 78 percent for rural water; and from 77 percent to 81 percent for rural sanitation. Overall, 404,000 more persons must be provided with access to water and 404,000 more to sanitation. These increases are the second lowest in the region, higher only than Belize, whose population is one-twelfth that of Panama.

As a result of the country's political and financial instability, however, external donor financing for Panama has been extremely low for the past several years. Only \$500,000 in external financing (from UNICEF) is committed to the sector at present, creating a shortfall of \$119 million. Given the recent change in government and improvements in its financial status, Panama should acquire additional funding resources for the sector from agencies like USAID, the IDB, and the World Bank in the next few years.

3.3 Regional Summary

Each of the nations in Central America faces substantial challenges to attaining the 1995 coverage targets. Of the estimated \$1.1 billion required only \$175 million is currently committed, leaving a deficit of more than \$926 million. (More funding than is necessary has been committed to rural water and sanitation in Costa Rica and to rural water in Honduras. But these surpluses have not been reallocated to sectors with funding deficits and do not reduce the deficit to meet WASH targets.) In order to reach the prescribed 1995 levels, additional investments of \$251 million will be necessary for urban water, \$445 million for urban sanitation, \$189 million for rural water, and \$40 million for rural sanitation. Table 7 presents the funding shortfalls for each country and for the region by subsector. The data clearly illustrate that urban expansion will require significantly greater investments than rural development. This is the result of two factors: regionwide trends to heavy urbanization, and greater per capita costs for installing water and sanitation facilities in urban centers.

The annual funding to meet shortfalls is shown in Table 8. To eliminate the deficit, approximately \$185 million in additional investments will be needed each year over the next five years. Five of the seven countries will require more than \$20 million per year. Again, investments are much lower for rural than for urban populations.

Although funding needs are far greater in urban than in rural areas, it is important to keep in mind that current coverage in rural zones is far lower than in urban centers. Further, in many countries, attaining the 1995 targets would still leave rural areas lagging significantly

behind urban centers. If rural populations are to achieve coverage parity with urban inhabitants, investments in rural advances must remain a priority.

A.I.D., along with the KfW, UNICEF, and CIDA, has played a significant role in expanding water and sanitation services in Central America, particularly in rural areas. Financing for activities in municipal areas comes primarily from the IDB and the IBRD. Currently, much of this funding supports rehabilitation and upgrading rather than service expansion. Within the urban sector, A.I.D. has and should continue to focus on providing services to marginal, low-income communities where coverage is substantially lower than overall urban levels.

Three countries, Guatemala, Honduras, and Nicaragua, face the most critical funding shortages in the region. To meet the WASH targets, Guatemala will require \$235 million, Honduras \$212 million, and Nicaragua \$157 million in additional investments. Current coverage levels in Guatemala and Nicaragua are among the lowest in the region. El Salvador is in need of funding to boost coverage for rural areas which remains at dangerously low levels in both water and sanitation. These countries should continue to be priorities for future assistance.

In most cases, the financing of water and sanitation projects involves both local and external financing. With growing inflation, indebtedness, and other financial difficulties, there is little funding available for local investments in the sector. A.I.D.'s water and sanitation projects are normally funded with Development Assistance (DA) funds, or in urban areas, through the Housing Guarantee (HG) program, and often involve counterpart funding. Because of the dearth of local funds, however, A.I.D. has in some cases financed the local component through the Economic Support Fund (ESF). A.I.D. may have to use a combination of ESF and DA monies to finance the local and external shares of future water and sanitation projects. A.I.D. may also be able to assist countries in local capital formation to facilitate the increased availability of local counterpart funds for projects in the sector.

An important new initiative is underway in the development of a collaborative program among the external support agencies (ESAs) to improve water and sanitation sector operations in Central America. Strengthening the sector is a critical step for increasing Central America's capacity to absorb the additional funds needed to improve health and living conditions of the rural and peri-urban poor, provide the infrastructure to support economic growth, and protect against the growing threat of cholera in the region. The impetus for establishing such a collaborative mechanism originated in an agreement between UNICEF and UNDP/World Bank. The agreement called for closer collaboration in the region to address the needs of the various national Social Investment Funds. This has quickly evolved into a more general agreement among a broader group of multilateral and bilateral agencies to explore the possibility of establishing a program for collaboration across the sector.

A joint mission including PAHO, UNICEF, UNDP/World Bank, WHO, A.I.D./WASH, and GTZ went to Central America in May 1991 to assess the demand for technical assistance in the region and to explore options for establishing a collaborative mechanism. The mission found convincing evidence that improved collaboration would benefit the water supply and sanitation efforts throughout Central America. There is now a high level of commitment underway to develop concrete mechanisms for increased, better-targeted technical assistance to the sector and to ensure greater communication, information sharing, and cooperation between ESAs and country institutions.

3.4 WASH's Lessons Learned

This report has focused on the importance of the construction of facilities to increase access to water supplies and sanitary excreta disposal. However, in its work over the past 10 years, WASH has seen that multifaceted challenges must be addressed in order to achieve the desired results. In rural communities throughout Central America, where diarrheal and intestinal diseases contribute significantly to infant and child mortality and morbidity, health and hygiene education (focusing on women and children) is a particularly critical element of water and sanitation activities. Further, in many countries, human waste is the source of most diarrheal and intestinal worm diseases.

In urban areas, where other sources of pollution are becoming increasingly problematic, environmental education and improvements are also critical. Appropriate solutions for solid waste and industrial waste disposal are essential to ensure that water supplies in urban centers are in fact potable.

In supporting the expansion of water supply and sanitation facilities, it is not sufficient to commit resources to local institutions, which often lack the capacity to absorb such resources. Training in such areas as operation and maintenance is critical to ensuring the sustainability of water supply and sanitation improvements. Other areas for improvement include the development of information systems, improved planning, and the reduction of unaccounted-for water in urban systems. Many countries in the region have relied heavily on loans from the IDB and World Bank to finance projects in the sector. Given the difficulties encountered in repaying currently outstanding loans, it is important for these nations to seek alternative methods of financing to supplement these loans, including donations and cost-recovery or tariff schemes. The development and transfer of inexpensive appropriate technologies is also vital to ensure that systems can be implemented and maintained efficiently.

National and community-level participation in planning, execution, and maintenance is important to ensuring the success of water and sanitation programs. In addition, although private enterprise does not currently play a prominent role in the sector, it may be possible to expand this role in areas such as system maintenance and operation, financing, project design, construction, and the provision of materials and supplies.

Central America faces a formidable challenge in the water supply and sanitation sector in the 1990s. The goals established either by external agencies such as WASH or by national or regional entities require substantial resources. To realize these goals, the various agencies, institutions, and communities involved must form partnerships at both the policy and operational levels, with a long-term commitment to build the systems and the capacity to maintain them.

TABLE 8

**Annual Costs to Fund Shortfalls and Meet 1995 Targets
(1990 US \$000s)**

COUNTRY	URBAN AREAS			RURAL AREAS			OVERALL
	TOTAL	WATER	SANITATION	TOTAL	WATER	SANITATION	
BELIZE	\$979	230	749	2,273	984	1,289	3,252
COSTA RICA	\$21,545	10,616	10,929	0	(477)	(155)	21,545
EL SALVADOR	\$7,750	2,968	4,782	8,019	7,397	622	15,769
GUATEMALA	\$22,544	10,302	12,242	24,417	21,704	2,713	46,961
HONDURAS	\$41,667	11,342	30,326	689	(4,444)	689	42,356
NICARAGUA	\$25,634	8,095	17,539	5,766	3,797	1,968	31,400
PANAMA	\$19,118	6,671	12,447	4,693	3,956	737	23,811
TOTAL	\$139,237	50,224	89,014	45,857	37,838	8,018	185,094

Annual costs determined by dividing total funding needed by five (for FY 1990-1995).

INTRODUCTION TO THE APPENDICES

The current status of water and sanitation coverage in each of the seven Central American countries is examined in detail in the following appendices. Each country profile contains a detailed discussion of current and proposed externally funded projects in the sector, current coverage levels, the 1995 WASH targets for each subsector, and the investment required to attain the goals. The appendices also provide health, economic, and social indicators and a brief overview of current socioeconomic and health conditions.

DATA SOURCES

Data included in the appendices were obtained from the following sources:

Population

Population data, including urban/rural breakdowns and current growth rates, were provided by the USAID missions in each country and obtained from national statistics and census or planning offices, with the following exceptions: population estimates and growth rates for Nicaragua, as well as growth rates for Belize, were obtained from the 1990 World Population Data Sheet published by the Population Reference Bureau, population estimates for El Salvador were obtained from the U.S. Bureau of the Census. Population estimates for 1995 were obtained by extrapolating current populations, using the growth rates provided.

Infant and Under 5 Mortality Rates

These figures were provided by A.I.D.'s Center for International Health Information; they represent the most current values for selected indicators as maintained by CIHI.

Infant Mortality Rate: The estimated number of deaths in infants (children under age one) in a given year per 1,000 live births in that same year. An IMR may be calculated by direct methods (counting births and deaths) or by indirect methods (applying well-established demographic models.)

Under 5 Mortality: The estimated number of children born in a given year who will die before reaching age 5 per thousand live births in that same year. The under 5 mortality may also be calculated by direct or indirect methods.

Mortality Rate due to Infectious/Parasitic Diseases and Diarrheal/Intestinal Diseases

This information was obtained from PAHO's 1990 Health Conditions in the Americas and represents the number of deaths from these diseases per 100,000 persons.

Life Expectancy, Adult Literacy, GNP per Capita, GNP Growth Rate, and Inflation

This information was taken from the 1990 World Development Report published by the World Bank. GNP data for 1989 are cited from Social Indicators of Development 1990, a World Bank publication. GNP and literacy data for Nicaragua are also cited from this publication.

Currency Exchange Rates

Foreign exchange rates were obtained from the Bank of America Global Trading as cited in the Wall Street Journal of April 15, 1991, and reflect official and free market exchange rates as of April 12, 1991.

Estimated per Capita Costs for Construction of Facilities

Data on unit costs for construction of water supply and sanitation facilities are based on data provided by PAHO. For Nicaragua and Panama, 1985 PAHO data were inflated at 5 percent annually to develop current estimates. Unit costs for all other countries are based on a 5 percent cost increase over the estimates used in the 1989 update.

TABLES AND FIGURES

Each profile includes a number of tables and figures that document the coverage and investment data discussed in the main text. They appear at the end of each appendix in the following order:

Actual Water Supply Coverage vs. 1995 Targets

Table 1 provides historical data on water supply coverage in urban and rural areas for selected years from 1980 to 1990 and shows the WASH targets for 1995. Coverage is expressed in terms of the number of individuals and the percentage of the population with access to water services.

Actual Sanitation Coverage vs. 1995 Targets

Table 2 provides historical data on sanitation coverage and the WASH targets for 1995. As in Table 1, these data are expressed in terms of percentages and numbers of persons.

Urban and Rural Water Supply Coverage

Figure 1 tracks water supply coverage in urban and rural areas by percentage from 1984 to 1990.

Urban and Rural Sanitation Coverage

Figure 2 charts data for sanitation in the same format as Figure 1.

Investment Needed to Meet 1995 Targets

Table 3 presents an estimate of the investment needed to attain the WASH objectives for 1995, as well as the projected investment shortfall. This table also provides the data on which the investment requirement is calculated. The number of persons to be covered by 1995 was multiplied by the per capita costs of constructing water and sanitation facilities to determine the total investment needed. The funding shortfall is then determined by subtracting firmly committed investments from this figure. Figure 3 provides a visual reference. The solid portion of Figure 3 represents current commitments, and the patterned portion shows the shortfall in funding to meet the goals.

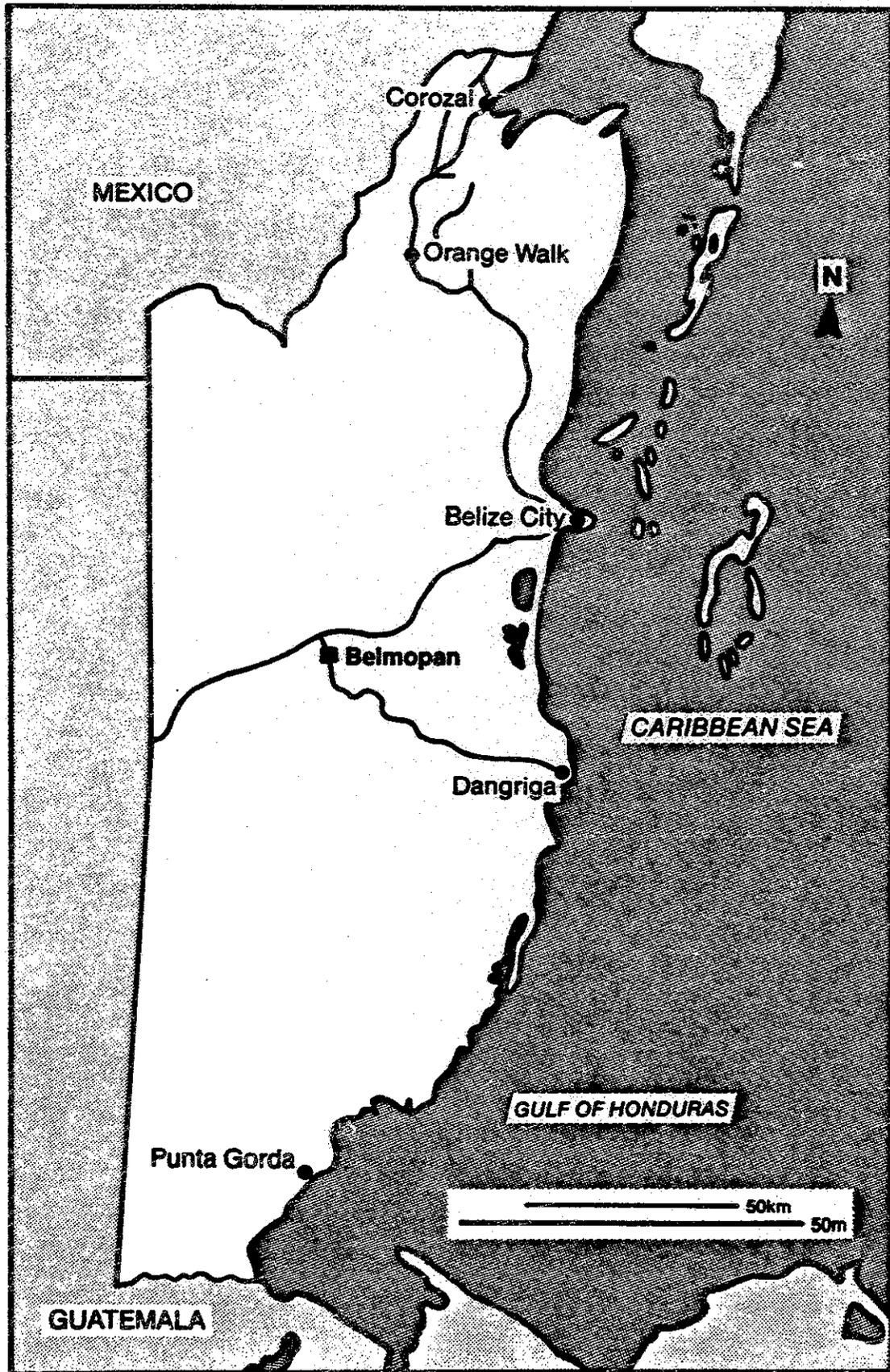
1990 Coverage vs. 1995 Targets (Percentage of Population with Coverage)

Figure 4 compares WASH's 1995 targets, expressed as percentage goals, with the current (1990) percentage of each country's population that has water and sanitation coverage.

1990 Coverage vs. 1995 Targets (Number of Persons with Coverage)

Figure 5 compares the number of persons who currently have access to water and sanitation services with the number required to meet the 1995 targets.

BELIZE



APPENDIX A

BELIZE

COUNTRY BACKGROUND

With a land mass of 22,962 square kilometers and 188,000 inhabitants, Belize is the second smallest Central American nation in area and has the smallest population. Belize's demographic situation is unusual; over the past 10 years, relatively rapid natural population growth and emigration from neighboring countries (estimates of Belize's refugee population range from 15,000 to 40,000) have been offset by immigration to the United States.

Belize's per capita GNP of \$1,500 ranks among the highest in the region. The country has an open economy and

experienced a real GDP expansion of more than 5 percent in 1987 and 1988. Much of Belize's growth in recent years has been concentrated in the agricultural and manufacturing sectors, and exports of citrus, bananas, fish, and other products have increased.

The Government of Belize (GOB) is committed to providing health services to the entire population, using community participation and intersectoral coordination as key elements of its health plan. Approximately 86.8 percent of the population is covered by health services provided by the government's national network of health centers; 56.1 percent have direct access, while 32.5 percent are served through periodic visits and mobile clinics. Unlike most of its regional neighbors, Belize does not have a high death rate from diarrheal and intestinal diseases; according to PAHO, deaths due to intestinal infections have dropped by 60 percent over the past decade.

The country is divided into six states, each currently served by a water and sanitation project. Two national agencies are responsible for work in the water and sanitation sector: the Water and Sewerage Authority (WASA), which provides engineering and technical support, and the Ministry of Natural Resources, which is responsible for the implementation of all water and sanitation projects.

COUNTRY PROFILE

1990 Population:	188,000
	Urban: 103,000
	Rural: 85,000
Population Growth Rate:	Urban: 3%
	Rural: 3.2%
Infant Mortality Rate:	25
Under 5 Mortality Rate:	43
Mortality Rate due to Infectious and Parasitic Diseases:	31.1
Mortality Rate due to Diarrheal Diseases:	16.2
Life Expectancy:	68
	(Male 66, Female 71)
Adult Literacy Rate:	92%
GNP per Capita (1989):	\$1,720
GNP per Capita (1988):	\$1,500
GNP per Capita Annual Growth from 1965-88:	2.4%
Currency:	Belize Dollar 2 = \$1
Average Annual Inflation from 1980-88:	2.2%

UNICEF has committed \$1,050,000, or \$210,000 per year, in water and sanitation assistance for the next five years. Because its effort will focus primarily on institutional development and training, only 10 percent of the total funding has been included in the investment analysis.

UNICEF's program in the Toledo district of Belize, which was completed in 1989, provided nearly 2,000 families with access to water supply systems and completed the installation of 365 ventilated pit latrines. Though UNICEF does not itself plan to continue the Toledo project, the United Nations Committee on Refugees is examining the possibility of continuing this effort and extending it to serve refugee populations. UNICEF also recently provided technical assistance to the GOB in preparing a national water and sanitation strategy covering both urban and rural areas of the country.

Total funding committed to increase coverage: \$105,000

- **USAID/CARE**

USAID funds two water and sanitation projects covering five of the country's six districts. One project is scheduled for completion in 1991; the other will be extended to provide institutional strengthening support. USAID has no current plans to extend services in the sector.

The Village Level Water and Sanitation (VLWS) Project, which is being implemented by CARE/Belize, will provide approximately 10,800 persons in the northern districts of Corozal and Orange Walk with latrines and water through water system construction. The project will construct 75 wells and over 1,000 latrines. The health education component of the project, supplemented by CARE's Maternal and Child Health and GROWTH Projects, is particularly critical in these districts, where childhood disease and death rates are among the highest in the country. Funding for the VLWS project, including GOB counterpart funding of \$10,500, will total \$126,000 in 1991.

The second project funded by USAID operates in rural communities in the districts of Cayo, Stann Creek, and Belize. This effort, the Increased Productivity Through Better Health (IPTBH) Project, involves interventions in water supply, sanitation, vector control, and health education. By the end of the project, 12,600 people will have received water and sanitation services. Funding for the water and sanitation component is estimated at \$420,000 for the remainder of the project. Counterpart funding by the GOB and beneficiary communities totals \$4,110,000 for the life of the project, of which \$2,930,000 has been disbursed. USAID currently is preparing a 30-month extension of the IPTBH Project to September 1993. The additional commitment of approximately \$300,000 will support activities to strengthen the institutional capabilities of government ministries and communities in operation, maintenance, and cost recovery. In addition, the project will continue to provide

health education directed at institutionalizing behavioral change in health and hygiene practices.

Like UNICEF, A.I.D. follows a standardized national approach in Belize for the use of materials and technology by agencies in different districts and for the installation of water and sanitation facilities.

Total funding committed to increase coverage: \$546,000

Current Coverage

As shown in Tables and Figures A-1 and A-2, Belize currently provides water services to 95 percent of its urban population, while 66 percent of urban dwellers have access to sanitation facilities. In the rural areas, only 53 percent have access to a water system and only 21 percent have access to sanitation facilities. The coverage reported for 1990 represents a departure from the trends documented in previous WASH reports. The new statistics are the outcome of a 1990 situational analysis conducted by CARE, the first attempt in many years to count and verify water and sanitation facilities in Belize. Figures provided in earlier years probably included substandard facilities including open, hand-dug wells and uncovered pit latrines. The new data, presenting a more accurate picture of adequate water supply and excreta disposal systems, have been adjusted to reflect WASH's definition of urban and rural service coverage.

The coverage estimates for 1990 in three subsectors—urban sanitation, rural sanitation, and rural water—are substantially lower than those reported for 1989. Because WASH's 1995 goals assumed higher existing coverage, the targets seek considerable increases over the 1990 figures. WASH's rural sanitation target seeks an increase of 63 percent. Given the small size of Belize's population, however, the targets, albeit ambitious, aim for relatively low gains in the numbers of additional persons to be served.

Meeting the 1995 Urban Water and Sanitation Targets

Belize has already achieved one of the four 1995 WASH targets established in the 1990 Planning Document for Central America. In 1990, its coverage of 95 percent in urban water surpassed the target of 93 percent. To maintain this level of coverage through 1995, it will need only a minimal expansion in urban water services to serve an additional 12,000 consumers. To meet the goals established for urban sanitation, Belize should increase coverage from 66 percent to 93 percent. Based on its current population growth rate of more than 3 percent, it will have to provide an estimated 41,000 additional persons with hygienic excreta disposal facilities over the next five years.

With the smallest population in the region and slower growth in urban than in rural areas, Belize requires relatively small increases in coverage to meet WASH's targets for urban areas. Funding for urban development, provided solely by CIDA over the past several years, will end in 1992 with the termination of the Belize City project. WASH estimates that, under this project, slightly more than \$1 million is committed to service expansion in urban centers. As shown in Table and Figure A-3, the targets require an estimated \$1.9 million for water system expansion and \$4.2 million for sanitation facilities. At present, Belize faces a deficit of approximately \$4.9 million to meet the urban targets.

Meeting the 1995 Rural Water and Sanitation Targets

In rural Belize, 66 percent of the population has access to a water system and 21 percent has access to adequate sanitation facilities. The 1995 goals, shown in Tables 1 and 2 and Figures 4 and 5, require Belize to reach 81 percent coverage in rural water services and 84 percent in rural sanitation. As in urban areas, expansion is more critical in sanitation than in water, with 67,000 persons requiring sanitation services and 36,000 requiring water. An estimated \$5.6 million is necessary to achieve the targets for access to water services; less than one-tenth this amount—\$694,000—is currently committed to this subsector (Table and Figure A-3). WASH estimates that \$6.9 million is required to meet the sanitation target, of which \$457,000 has been committed. At \$11.4 million, the shortfall for the rural sector, shown in Table and Figure A-3, is more than twice the deficit for urban areas.

TABLE A-1

Actual Water Supply Coverage vs. Targets

WATER SUPPLY									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	146	99	68%	73	71	97%	73	28	38%
BASELINE 1984	156	98	63%	78	71	91%	78	27	35%
1986	162	112	69%	83	79	95%	79	33	42%
1988	174	125	72%	89	80	90%	85	45	53%
1989	180	150	83%	95	86	91%	85	64	75%
1990	184	138	75%	97	92	95%	87	46	53%
TARGETS FOR 1995	214	187	87%	112	104	93%	102	82	81%

Population figures are rounded to the nearest thousand. 1990 population data have been adjusted to match WASH definitions. Coverage has been adjusted to reflect these changes. Coverage shown for 1990 reflects the results of CARE's Situational Analysis of the sector, conducted in 1990. CARE's findings deviate from the previous trend reported by WASH, but are felt to be a more accurate reflection of current coverage. WASH data included unimproved sources of water and sanitation, described in Annex A.

TABLE A-2

Actual Sanitation Coverage vs. Targets

SANITATION									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	146	96	66%	73	43	59%	73	53	73%
BASELINE 1984	156	97	62%	78	48	62%	78	49	63%
1986	162	124	77%	83	69	83%	79	55	70%
1988	174	145	83%	89	80	90%	85	65	76%
1989	180	154	86%	95	86	91%	85	68	80%
1990	184	82	45%	97	64	66%	87	18	21%
TARGETS FOR 1995	214	190	89%	112	105	93%	102	85	84%

Population figures are rounded to the nearest thousand. 1990 population data have been adjusted to match WASH definitions. Coverage has been adjusted to reflect these changes. Coverage shown for 1990 reflects the results of CARE's Situational Analysis of the sector, conducted in 1990. CARE's findings deviate from the previous trend reported by WASH, but are felt to be a more accurate reflection of current coverage. WASH data included unimproved sources of water and sanitation, described in Annex A.

BELIZE URBAN AND RURAL WATER SUPPLY COVERAGE

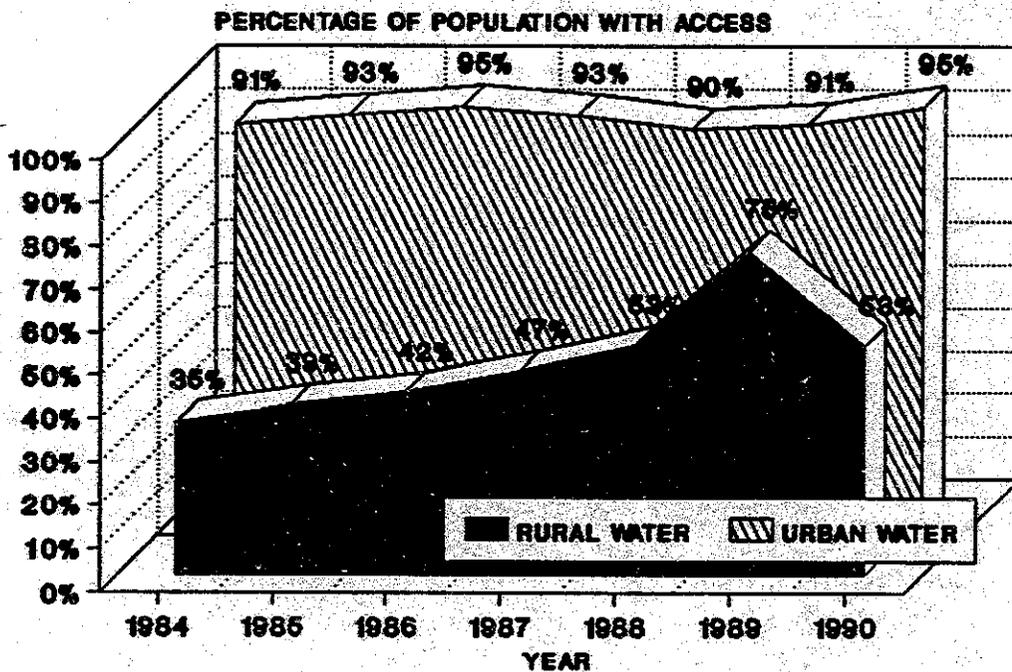


Figure A-1

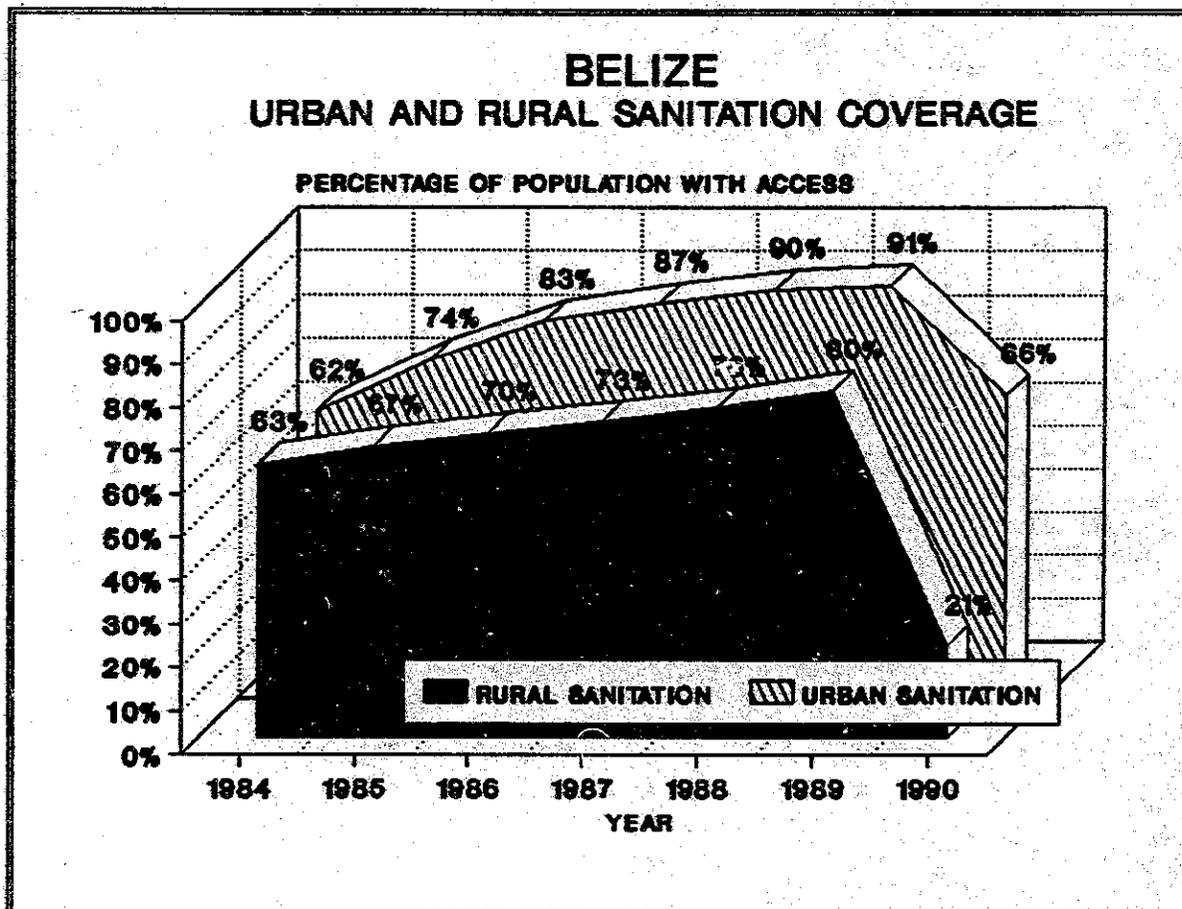


Figure A-2

TABLE A-3

Investment Needed to Meet 1995 Targets (1990 US \$000s)

	WATER SUPPLY COVERAGE (PERSONS—000s)			SANITATION COVERAGE (PERSONS—000s)			TOTAL FUNDING REQUIRED
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	
TARGET FOR 1995 (000s)	186	104	82	190	105	85	N/A
COVERAGE IN 1990	138	92	46	82	64	18	N/A
REQUIRED INCREASE	48	12	36	108	41	67	N/A
ESTIMATED UNIT COST (US \$ PER CAPITA)	N/A	\$156	\$156	N/A	\$103	\$103	N/A
ESTIMATED TOTAL COST TO MEET 1995 TARGETS (000s)	\$7,488	\$1,872	\$5,616	\$11,124	\$4,223	\$6,901	\$18,612
FIRMLY COMMITTED INVESTMENTS (000s)*	\$1,418	\$724	\$694	\$933	\$476	\$457	\$2,351
PROJECTED FUNDING SHORTFALL (\$000s)	\$6,070	\$1,148	\$4,922	\$10,191	\$3,747	\$6,444	\$16,261

*Includes only those investments to increase coverage.

BELIZE

INVESTMENT NEEDED TO MEET 1995 TARGETS

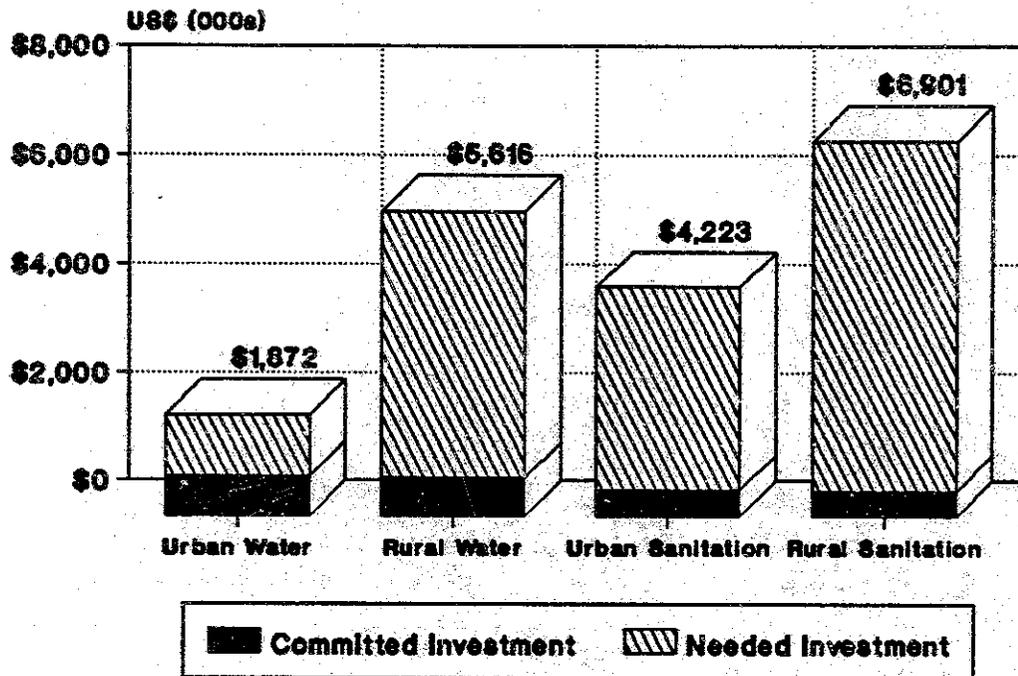


Figure A-3

BELIZE
1990 COVERAGE AND 1995 TARGETS
(% OF POP.)

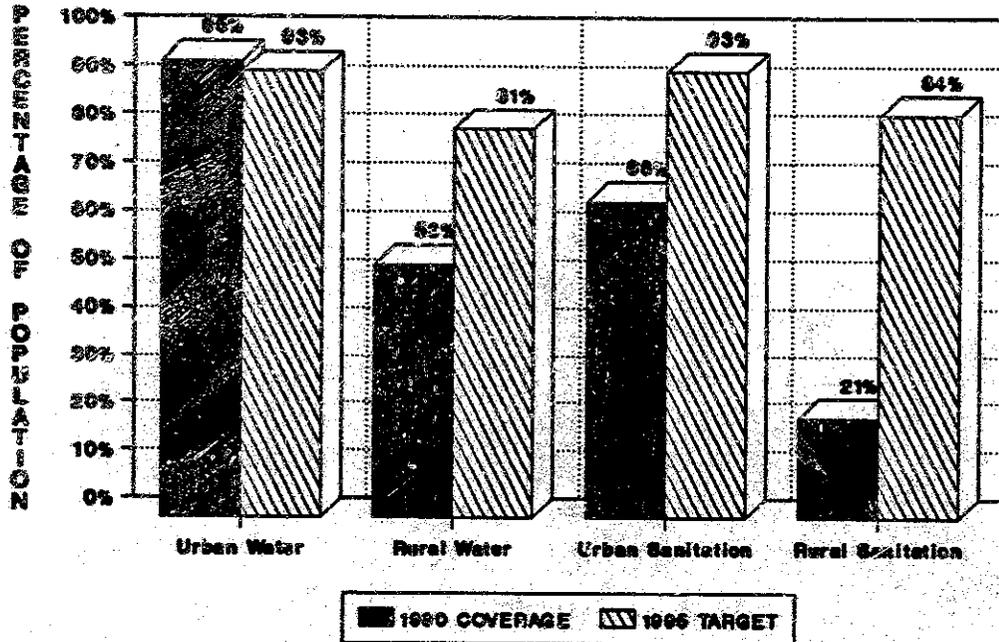


Figure A-4

BELIZE
1990 COVERAGE AND 1995 TARGETS
(NO. OF PEOPLE)

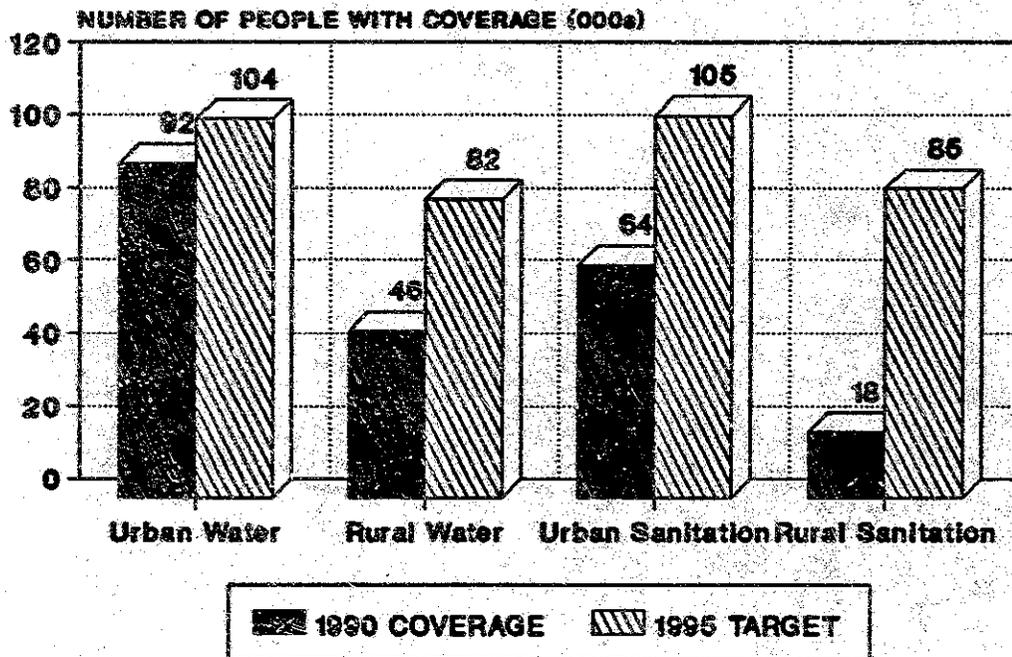
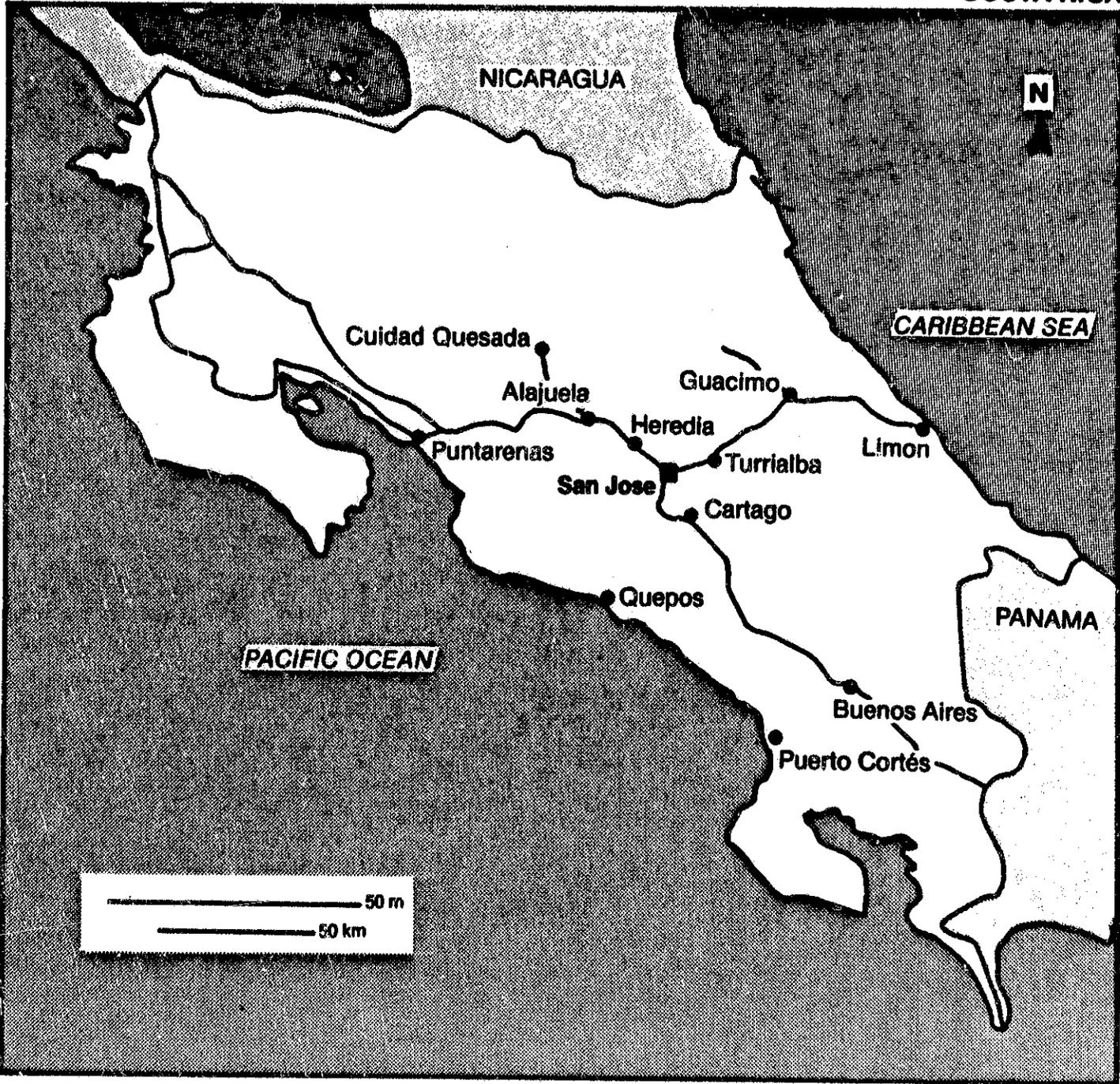


Figure A-5

COSTA RICA



NICARAGUA

N

CARIBBEAN SEA

Ciudad Quesada

Alajuela

Guacimo

Heredia

Limon

Puntarenas

Turrialba

San Jose

Cartago

Quepos

PANAMA

PACIFIC OCEAN

Buenos Aires

Puerto Cortés

50 m

50 km

SD -

APPENDIX B

COSTA RICA

COUNTRY BACKGROUND

Within Costa Rica's 50,909 square kilometers of territory, water resources are abundant. Costa Rica encompasses 34 river basins and possesses adequate surface and groundwater resources to serve its population of just over 3 million. These resources, however, are being rapidly undermined by industrial, agricultural, and domestic waste pollution, which constitutes a serious health problem for the nation.

Despite a continuing decline in the population growth rate, the current rate of increase is still 2.5 percent. In addition, Costa Rica in recent years has experienced an influx of refugees from neighboring countries. Internal migration is characterized by two major trends: shifts from small cities and rural areas to major urban centers, and from depressed rural areas to those undergoing development. The latter trend is reflected in the population estimates, which show a substantial shift from the rural to urban, the result of population growth in two small cities which were reclassified as urban areas in 1990.

With the highest GNP per capita in the region, Costa Rica is relatively prosperous and economically stable. This status is largely the result of successful adjustment policies, introduced in the early 1980s in response to an economic crisis, that stressed export promotion and restrictions in public spending. In order to reduce the impact of these policies on the poor, they were accompanied by a program for social compensation.

Health is a priority investment for the Government of Costa Rica (GOCR), which, in 1973, enacted a national health law establishing health services as a public right. Basic health services are decentralized, and high levels of health service coverage are maintained in all parts of the country. These policies and investments have lowered infant and child mortality rates and produced sizable reductions in the incidence of preventable diseases such as acute diarrhea.

COUNTRY PROFILE	
1990 Population:	3.02 million Urban: 1.83 Rural: 1.18
Population Growth Rate:	Overall: 2.5% Urban: 3.84% Rural: 0.5%
Infant Mortality Rate:	18
Under 5 Mortality Rate:	22
Mortality Rate due to Infectious and Parasitic Diseases:	11.8
Mortality Rate due to Diarrheal Diseases:	4.6
Life Expectancy:	75 (Male 73, Female 77)
Adult Literacy:	93.6%
GNP per Capita (1989):	\$1,780
GNP per Capita (\$1988):	\$1,690
GNP per Capita Annual Growth from 1965-88:	1.4%
Currency:	Colon 116.65 = \$1
Average Annual Inflation from 1960-88:	26.9%

The government has given priority to water supply and sanitation service expansion during the International Drinking Water Supply and Sanitation Decade. Access to water and sanitation has been expanded to cover 100 percent of the urban population, and substantial gains have been made in rural areas. Despite this progress, however, nearly one in six rural Costa Ricans lacks access to a water supply system, and, although the incidence of several waterborne diseases has declined, the incidence of others, including viral hepatitis (currently 149 cases per 100,000 inhabitants), has increased. In the poorest areas of the country, mortality rates are twice the national average. Although basic sanitation service coverage has improved over the past decade, the solid waste problem has grown. PAHO reports that approximately 1.5 million kg of solid waste are produced daily, of which 16 percent is collected regularly but disposed of improperly and 54 percent is not collected at all.

Three local institutions work in the water and sanitation sector. The Instituto Costarricense de Acueductos y Alcantarillado (AyA), Costa Rica's national water and sewerage agency, has the authority to determine policies in water and sanitation. Instituto de Fomento y Asesoría Municipal (IFAM) and the Ministry of Health, through its Department of Wells and Sanitation, are also active in the sector.

COVERAGE LEVELS AND INVESTMENT

Current Projects

Despite relatively high coverage in water and sanitation services, Costa Rica's current population growth rate will require it to make substantial investments to maintain these levels of coverage. Three external agencies—the IDB, UNICEF, and Germany's KfW—currently support projects to expand water and sanitation service coverage. The World Bank is in the process of negotiating a new loan project which will involve water system expansion.

- **IDB**

The Inter-American Development Bank currently has two active loan programs. The first, a water supply program for San Jose and secondary cities, focuses on the rehabilitation and upgrading of existing systems. The second has three components: water supply improvement for medium-sized cities; a rural project to build new water systems in small towns; and a sewerage project for Puntarenas. It is estimated that 281,000 urban and 19,000 rural dwellers will benefit from improved water systems, and 23,400 residents of Puntarenas will receive sewerage services. Work under this loan will be implemented by AyA. Funding for both programs from 1986 to 1993 totals \$43.4 million, with the IDB contributing \$28.3 million and the GOCR contributing \$15.1 million.

As both programs primarily are intended to rehabilitate existing systems, only a fraction of the total investment has been committed to increased coverage. Since the expansion

component is greater than that of most rehabilitation and upgrading efforts, however, WASH has allocated 20 percent rather than 10 percent of the remaining funds to the investment analysis.

Total funding committed to increase coverage: \$3.7 million

- **KfW**

The German government, through the KfW, has approved a loan of \$7.4 million for a three-year rural water supply and sanitation project. Implementation has been delayed, however, pending the GOCCR's settlement of arrears with the KfW. The KfW anticipates that the national government's counterpart funding will total approximately one-third of project funds. The project, which will involve rehabilitation and expansion of water and sanitation facilities in approximately 100 small- and medium-sized villages, was scheduled to begin in 1990 but is likely to be delayed until arrears are settled.

Total funding committed to increase coverage: \$7,400,000

- **GTZ**

Since 1987, the German Agency for Technical Cooperation has provided institutional strengthening support to CAPRE (Comité de Agua Potable para la Región). CAPRE, a technical assistance committee, is headquartered in Costa Rica but has a regional scope, operating in Central America, Panama, and the Dominican Republic. Currently in its second phase, this program of support will end in December 1991. GTZ funding has provided support in four areas: institutional strengthening at both the national and regional levels; personnel training and the development of training materials; application and dissemination of information on appropriate technologies; and development of programs for the control of water losses. These activities will not directly expand water and sanitation services.

Total funding committed to increase coverage: \$0

- **Save the Children**

The focus of Save the Children's recent water and sanitation activities in Costa Rica has been environmental protection. In the past year it has conducted urban cleanup activities and environmental education in Puntarenas and Limón and the cleanup of a river in a residential area of Limón.

Total funding committed to increase coverage: \$0

- **UNICEF**

UNICEF's water and sanitation work focuses on mobilizing resources for activities targeted at the poorest groups and emphasizes the use of low-cost technologies. With UNICEF support, the Ministry of Health's department of wells and sanitation is currently working to provide access to safe water for 50,000 families in the town of Talamanca, which has the highest infant mortality rate in Costa Rica. UNICEF has provided materials and equipment for deep-well drilling and handpump installation and over the next five years plans to expand the Talamanca project to other areas without access to clean water. It is also providing the services of a technical consultant to analyze the efforts and plans of the Ministry of Health in the water and sanitation sector. UNICEF will spend \$100,000 annually to support its program in Costa Rica.

Total funding committed to increase coverage: \$500,000

- **USAID**

USAID involvement in the sector ended in mid-1990 with the completion of an AyA-administered project for constructing and rehabilitating water systems in urban and rural areas. USAID currently has no plans to begin new projects.

Total funding committed to increase coverage: \$0

- **World Bank**

The World Bank is preparing a new project for improving water systems, water use efficiency, and watershed protection. Although no amount has been negotiated, it anticipates the project to be in the \$40 to \$50 million range. AyA is preparing a proposal for implementing the different components of the project. If approved, the loan will finance the rehabilitation of water systems in San Jose. The planned loan program will also fund some limited expansion, as well as institutional strengthening for AyA.

Total funding committed to increase coverage: \$0

Current Coverage

Costa Rica continues to maintain the highest levels of water and sanitation service in Central America, sustaining full (100 percent) coverage in both urban water and urban sanitation in 1990. Rural coverage in 1990 is estimated at 87 percent for water and 94 percent for

sanitation services. Tables and Figures B-1 and B-2 show the current levels of water and sanitation services provided.

The 1989 coverage has been revised based on AyA data provided by USAID. Current coverage data also reflect recent population shifts responsible for the reclassification of several population centers from rural to urban.

Meeting the 1995 Urban Water and Sanitation Targets

Significant levels of funding will be necessary to sustain full coverage in urban water and sanitation. With a 3.8 percent urban population growth rate, Costa Rica will have to supplement its current resources to serve an additional 379,000 urban residents with water and sanitation services by 1995 (Tables B-1 and B-2, Figure B-5). Based on unit costs shown in Table B-3, the estimated cost of providing these facilities is \$116 million: \$58.5 million for water services and \$57.6 million for sanitation. Current funding commitments for water and sanitation in urban areas focus on rehabilitation and improvement. Funding for urban water and sanitation development in the next five years includes more than \$20 million firmly committed by the IDB, of which only \$3.7 million has been included in the analysis of funds committed for service expansion, and \$40 to \$50 million in potential commitments (also primarily for rehabilitation and improvements) from the IBRD.

Based on unit cost estimates derived from PAHO, Costa Rica has more than sufficient resources allocated to rural water and sanitation development to meet the 1995 goals. Assuming, however, that additional funds will not be diverted from rural development to urban service expansion, the country faces a shortfall of \$108 million in urban areas.

Meeting the 1995 Rural Water and Sanitation Targets

As illustrated in Tables B-1 and B-2 and Figure B-4, WASH's 1995 goals require coverage increases of 1 percent in both rural water and rural sanitation services. The percentage of rural inhabitants with water service, currently 87 percent, should reach 88 percent by 1995, while sanitation coverage should reach 95 percent to meet the target. These goals mean providing an additional 30,000 persons with access to water service and 37,000 with access to sanitation facilities (Figure B-5). Because of the low unit costs for expanding basic rural services, the cost to meet these goals is relatively low. Approximately \$4.7 million, of which \$3.5 million is required for water service expansion and \$1.2 million for sanitation systems, will be required to meet the targets (Table and Figure B-3). Given current commitments of more than \$8 million to the two rural subsectors, Costa Rica should be able to surpass the 1995 targets.

TABLE B-1

Actual Water Supply Coverage vs. Targets

WATER SUPPLY									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	2,210	1,960	89%	1,025	1,025	100%	1,185	935	79%
BASELINE 1984	2,405	2,154	90%	1,070	1,059	99%	1,335	1,095	82%
1986	2,531	2,281	90%	1,126	1,115	99%	1,405	1,166	83%
1988	2,790	2,572	92%	1,490	1,490	100%	1,300	1,082	83%
1989	2,940	2,770	94%	1,764	1,764	100%	1,176	1,006	86%
* 1990	3,015	2,859	95%	1,832	1,832	100%	1,183	1,027	87%
TARGETS FOR 1995	3,424	3,279	96%	2,211	2,211	100%	1,213	1,067	88%

Population figures are rounded to the nearest thousand.

** WASH has estimated 1990 coverage increases for rural areas based on current activity and trends for previous years. Urban centers are estimated at 100% coverage. No actual 1990 coverage data were available during report production.*

TABLE B-2

Actual Sanitation Coverage vs. Targets

SANITATION									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	2,210	2,044	92%	1,025	1,016	99%	1,185	1,028	87%
BASELINE	2,405	2,319	96%	1,070	1,059	99%	1,335	1,260	94%
1984									
1986	2,531	2,442	96%	1,126	1,115	99%	1,405	1,327	94%
1988	2,790	2,678	96%	1,490	1,475	99%	1,300	1,203	93%
1989	2,940	2,873	98%	1,764	1,764	100%	1,176	1,109	94%
* 1990	3,015	2,946	98%	1,832	1,832	100%	1,183	1,115	94%
TARGETS FOR 1995	3,424	3,364	98%	2,211	2,211	100%	1,213	1,152	95%

Population figures are rounded to the nearest thousand.

** WASH has estimated 1990 coverage increases for rural areas based on current activity and trends for previous years. Urban centers are estimated at 100% coverage. No actual 1990 coverage data were available during report production.*

COSTA RICA URBAN AND RURAL WATER SUPPLY COVERAGE

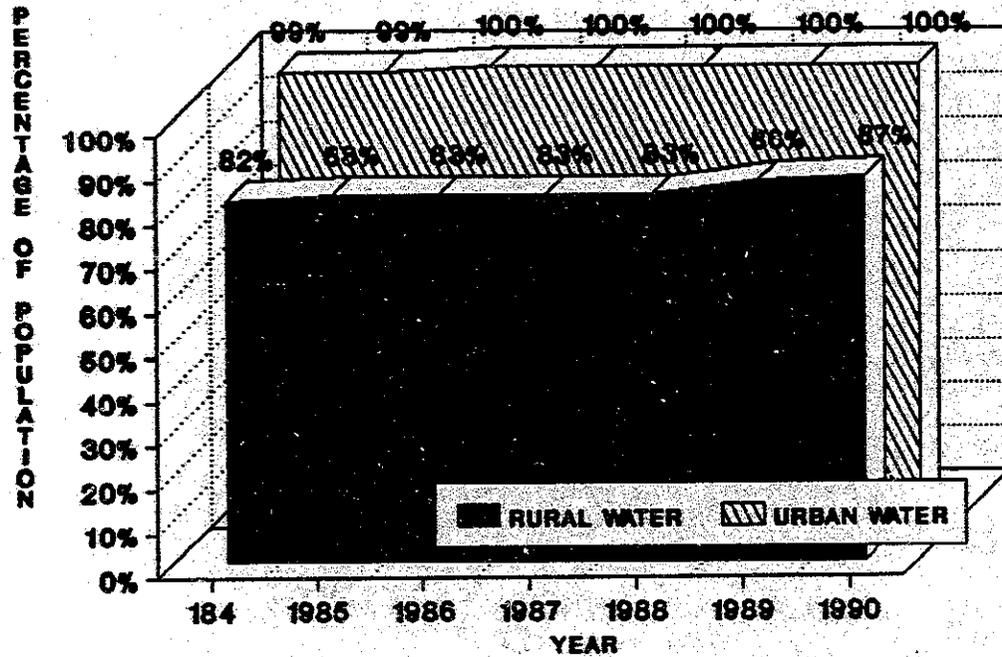


Figure B-1

COSTA RICA URBAN AND RURAL SANITATION COVERAGE

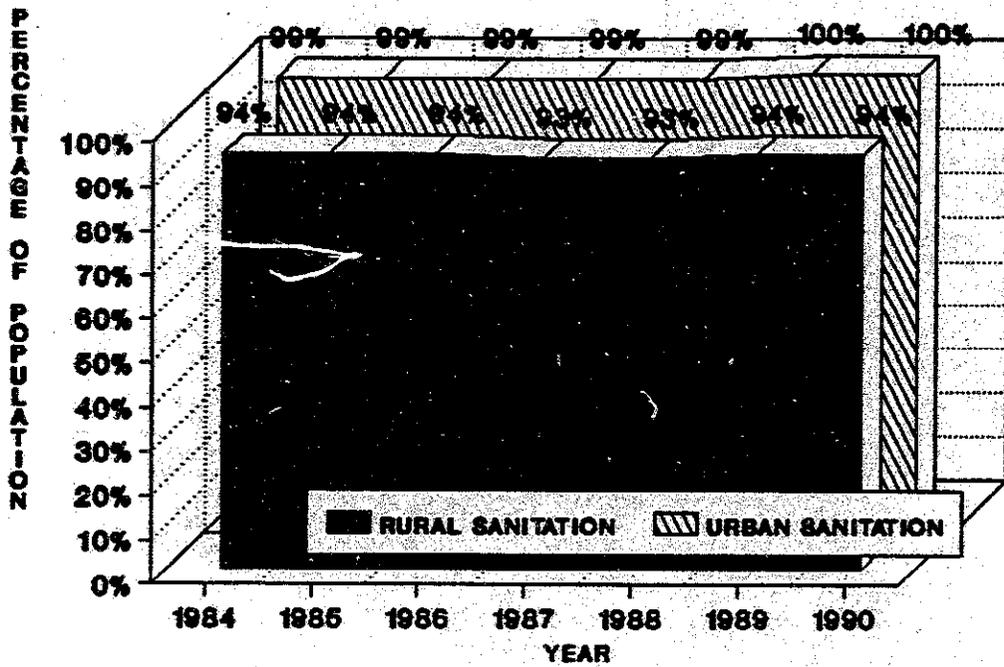


Figure B-2

TABLE B-3

Investment Needed to Meet 1995 Targets (1990 US \$000s)

	WATER SUPPLY COVERAGE (PERSONS—000s)			SANITATION COVERAGE (PERSONS—000s)			TOTAL FUNDING REQUIRED
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	
TARGET FOR 1995 (000s)	3,278	2,211	1,067	3,363	2,211	1,152	N/A
COVERAGE IN 1990	2,859	1,832	1,027	2,947	1,832	1,115	N/A
REQUIRED INCREASE	419	379	40	416	379	37	N/A
ESTIMATED UNIT COST (US \$ PER CAPITA)	N/A	\$145	\$89	N/A	\$149	\$32	N/A
ESTIMATED TOTAL COST TO MEET 1995 TARGETS (\$000s)	\$58,515	54,955	3,560	57,655	56,471	1,184	116,170
FIRMLY COMMITTED INVESTMENTS (\$000s) *	\$7,818	1,875	5,943	3,782	1,825	1,957	11,600
PROJECTED FUNDING SHORTFALL (\$000s) **	\$53,080	53,080	(2,383)	54,646	54,646	(773)	107,726

*Includes only those investments to increase coverage.

**The shortfall calculation assumes that funding in excess of a subsector's requirement for the 1995 targets will remain allocated to that subsector, allowing the expansion of services to exceed WASH's targets.

COSTA RICA INVESTMENT NEEDED TO MEET 1995 TARGETS

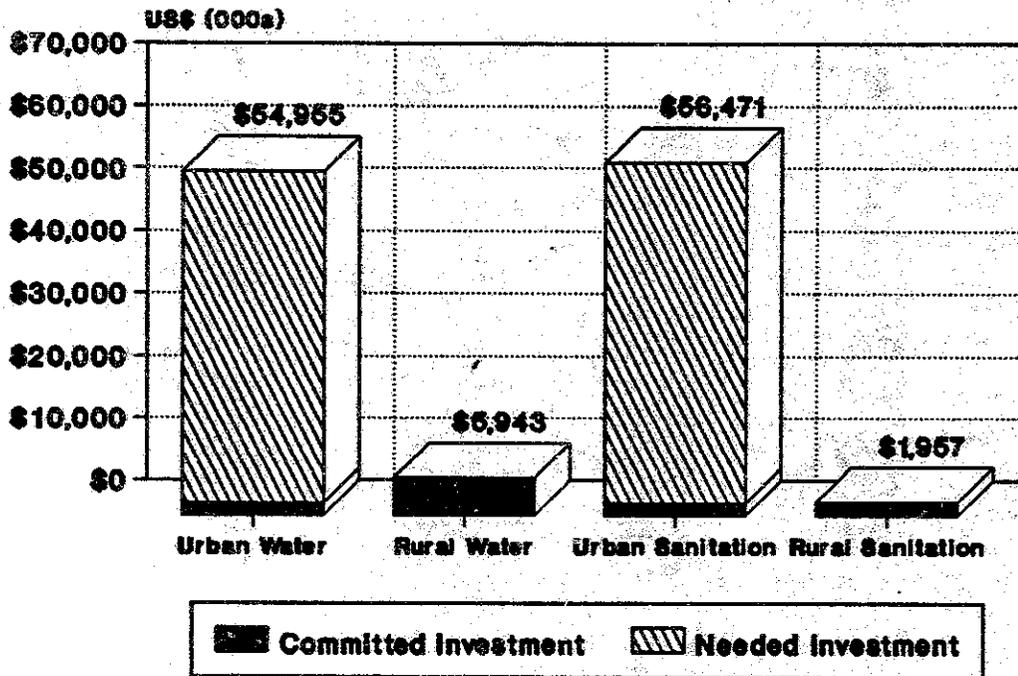


Figure B-3

**COSTA RICA
1990 COVERAGE AND 1995 TARGETS
(% OF POP.)**

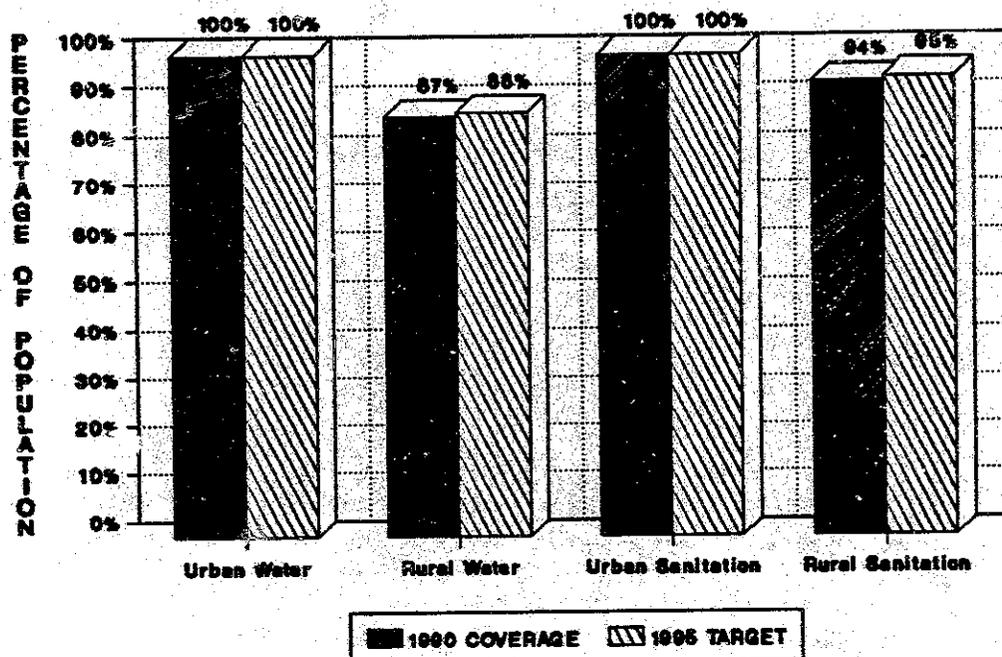


Figure B-4

**COSTA RICA
1990 COVERAGE AND 1995 TARGETS
(NO. OF PEOPLE)**

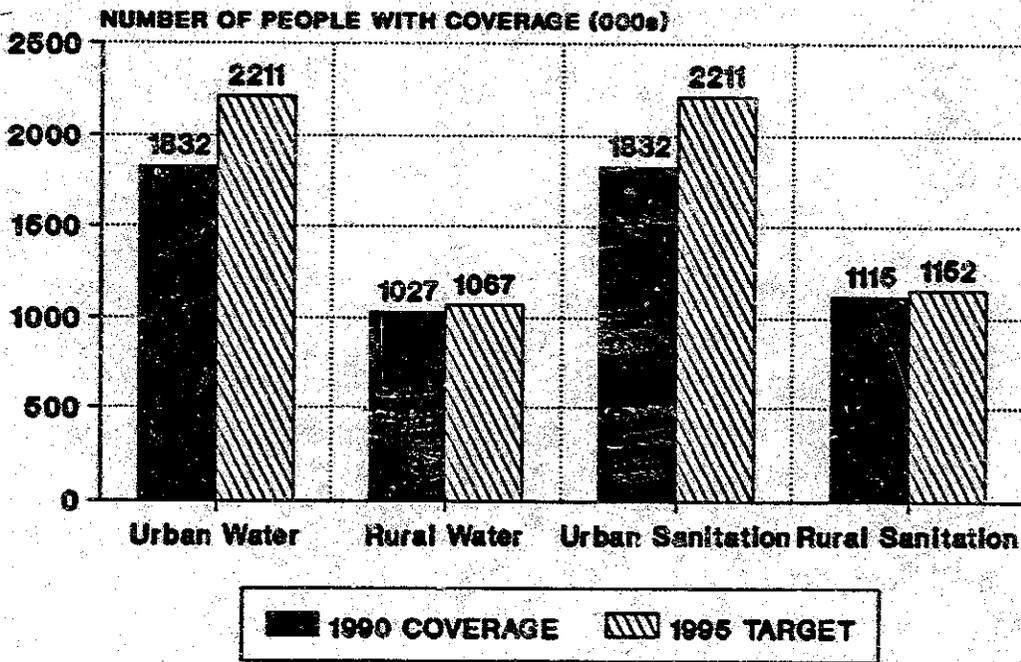
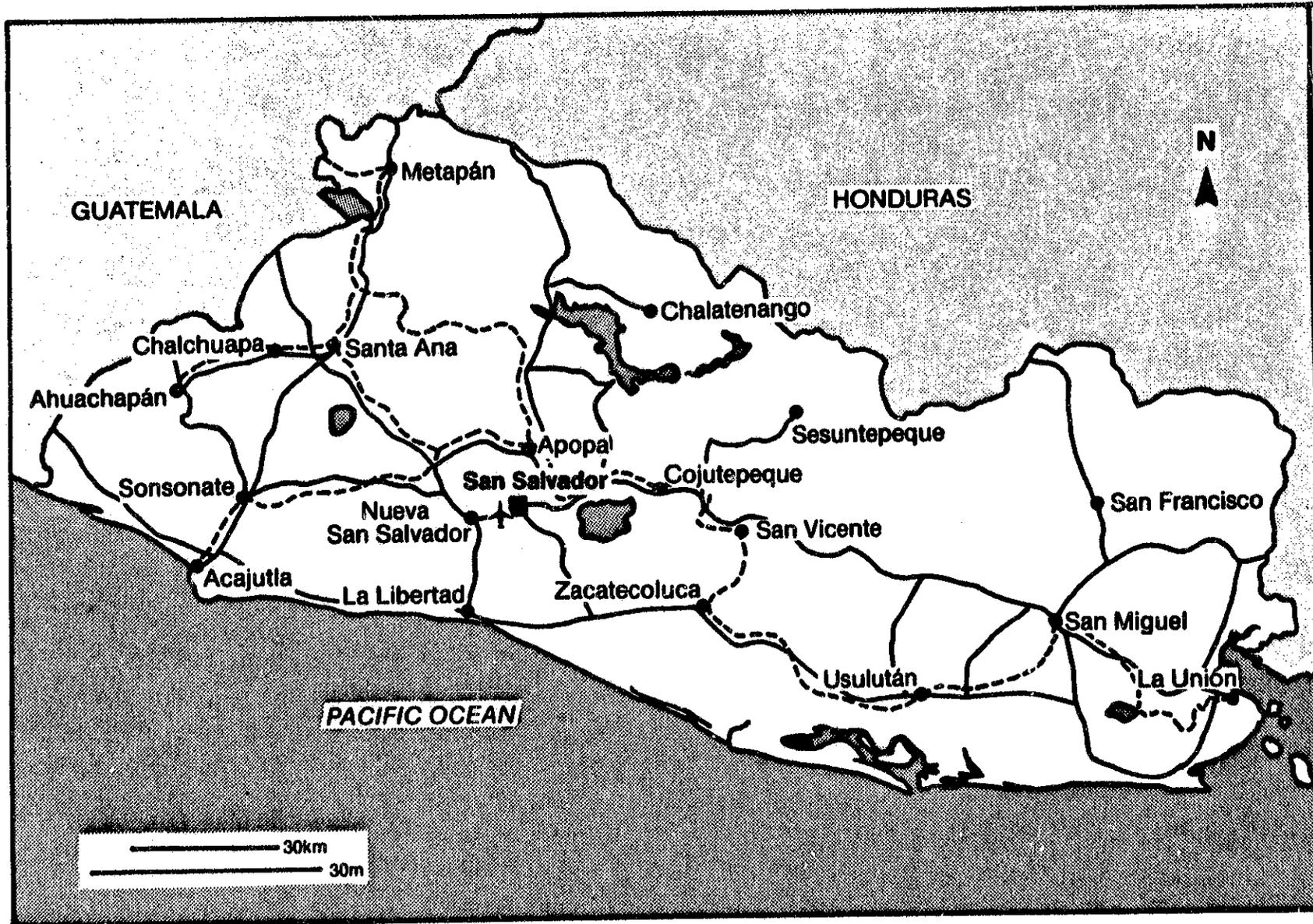


Figure B-5

EL SALVADOR

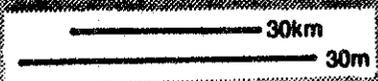


GUATEMALA

HONDURAS



PACIFIC OCEAN



-64-

APPENDIX C

EL SALVADOR

COUNTRY BACKGROUND

The Republic of El Salvador is the most densely populated country in the Americas, with a population of 5.2 million and a land mass of 21,040 square kilometers, or approximately 247 persons per square kilometer. Geographically, El Salvador is divided into three distinct regions: the mountainous region to the east (with elevations of up to 2,700 meters above sea level), the central plateau, and the coastal plains along the Pacific.

El Salvador's economic and social difficulties have been exacerbated by the decade-long internal conflict that continues to plague the country.

Despite ongoing upheavals, democratic processes and institutions are being developed. Nonetheless, even with substantial reforms, the Salvadoran economy suffers from rampant inflation and a growing balance of payments deficit. The economic crisis has been further aggravated by natural disasters, including floods, earthquakes, and droughts.

Access to water and sanitation services remains low, particularly in rural areas. Infant and child mortality rates have declined in recent years, but, with inadequate access to safe water supplies, diarrheal and intestinal diseases remain major health problems, particularly among children. According to PAHO, 60 percent of deaths among children under 1 year are due to infectious and parasitic diseases, especially diarrhea and parasitoses.

El Salvador faces major problems related to the environment and the ecosystem. PAHO reports leading difficulties include deforestation, the lack of effective environmental legislation, erosion, soil degradation, and the use of residual insecticides. Without increased investment to combat these problems, they will pose a serious obstacle to providing drinking water supply services.

Two national agencies are largely responsible for work in the sector: the Administración Nacional de Acueductos y Alcantarillados (ANDA) and the Plan Nacional de Saneamiento

COUNTRY PROFILE

1990 Population:	5.2 million
	Urban: 2.55
	Rural: 2.65
Population Growth Rate:	Overall: 2.7%
	Urban: 2.0%
	Rural: 3.3%
Infant Mortality Rate:	59
Under 5 Mortality Rate:	77
Mortality Rate due to Infectious and Parasitic Diseases:	60.6
Mortality Rate due to Intestinal and Diarrheal Diseases:	35.5
Life Expectancy:	Male 51, Female 64
Adult Literacy:	72.1%
GNP per Capita (1989):	\$1,070
GNP per Capita (\$1989):	\$940
GNP per Capita Annual Growth from 1965-88:	-0.5%
Currency:	Colon 8.02 = \$1
Average Annual Inflation from 1980-88:	16.8%

Básico Rural (PLANSABAR). ANDA is responsible for the provision of water services and sanitation facilities to urban populations of over 2,000 persons and to rural villages with under 300 residents. Towns with populations between 300 and 2,000 are served by PLANSABAR, a division of the Ministry of Public Health. Two coordinating committees, the Comité Nacional de Instituciones de Agua Potable y Saneamiento (CONIAPOS) and the Comité Ejecutivo Protector de los Recursos Hídricos (CEPHRI) also serve the sector. CONIAPOS is a water policy-determining body, and CEPHRI acts in an advisory capacity to all government institutions involved in water-related activities.

COVERAGE LEVELS AND INVESTMENT

Current Projects

As a result of internal conflict and natural disasters, El Salvador's water and sanitation systems are in need of rehabilitation and repair as well as expansion. Of the ongoing projects described below, three focus primarily on improvement and rehabilitation and 11 primarily on the expansion of services.

- **IDB**

The Inter-American Development Bank has three ongoing loan projects in El Salvador, the largest of which funds major water system and sanitation improvements for the city of San Salvador. Components of this project include the development of a new treatment plant, river intake, well field, transmission mains, and reservoirs, as well as the extension of the distribution system and substantial rehabilitation work. Construction on the first phase of the project, which is estimated to benefit 1,600,000 persons, has begun. The second project, for rural communities, will construct water supply systems to serve 230,000 persons. The third, and much smaller, project will repair damage done by the 1987 earthquake.

Two other water and sanitation projects are currently in the IDB's funding pipeline. The Acueductos Rurales (PLANSABAR IV) project will construct approximately 100 water systems in rural communities to benefit a population of 250,000 low-income inhabitants. Funding for this project (including counterpart funds) is estimated to be \$28 million. The second project, to be implemented by ANDA, will expand and rehabilitate water and sewerage systems for intermediary cities in the Salvadoran interior. Total funding from the IDB and the Government of El Salvador (GOES) is projected to be \$100 million. Both projects are in the pre-investment phase awaiting approval by the Bank's board of directors, and funding has not been included in the analysis.

	San Salvador (1988-1993)	Rural (1988-1992)	Emergency (1988-1992)
IDB	\$166,000,000	\$21,000,000	\$3,100,000
GOES	18,500,000	7,000,000	350,000
Total	\$184,500,000	\$28,000,000	\$3,450,000

Estimated funding to be disbursed in 1991 and 1992 under the rural water project has been included in its entirety in the investment analysis. In addition, 10 percent of the remaining funds under the San Salvador project have been included. Monies to be disbursed under the emergency works project, which exclusively supports rehabilitation, have been excluded.

Total funding committed to increase coverage: \$20,425,000

- **KfW**

The KfW has approved financing for one water and sanitation project, and another is still in the appraisal phase. Both projects currently are suspended as a result of delays in the negotiation process. The first will finance the construction of water and sanitation facilities for 15 municipalities, benefiting approximately 45,000 people in the central region of the country. Although feasibility studies for the work were completed in 1988, the \$10 million loan is still being ratified by the GOES. Funding for this project, which has been firmly committed by the German government, is included in the investment analysis.

The second project, a follow-on to a completed USAID project and also estimated to serve 45,000 people, will extend water systems and sewerage lines in urban and rural areas. If approved, it will be financed by a \$6 to \$7 million loan. GOES financial contributions to both projects are expected to be minimal. Starting dates have not yet been determined because of the ongoing negotiations.

Total funding committed to increase coverage: \$10,000,000

- **Save the Children**

In 1990, Save the Children completed a \$2 million five-year water system expansion project that involved the construction of a gravity-fed water system consisting of more than 200 kilometers of pipes and 12 major storage tanks. The system, which was inaugurated in March 1990, serves more than 15,000 residents of La Union province. Primary construction has been completed; however, Save the Children is currently conducting basic rehabilitation and repair work.

Save the Children is also implementing the USAID-funded Community-Based Integrated Rural Development Project described below.

Total funding committed to increase coverage: \$0

- **UNDP/PAHO**

The UNDP and PAHO are undertaking a major groundwater exploration project, the Community Water Supply, to improve drinking water supplies and sanitation for an estimated 400,000 people. The project has identified and evaluated available water resources through hydrogeological studies and test holes, supervised the construction of production wells, prepared water treatment norms, and conducted personnel training. As this project will not directly expand water systems, funding has not been included in the investment analysis.

Total funding committed to increase coverage: \$0

- **UNICEF**

UNICEF is working with the Ministry of Health, in close coordination with the Social Investment Fund, the Salvadoran Institute of Municipalities, and the Association of Municipalities, to improve water and sanitation facilities in 67 of the poorest rural communities. Within the targeted municipalities, the program will help to construct 60 mini-aqueducts and 365 wells fitted with handpumps and will install 25,000 dry-compost latrines. The program will also train community leaders and users to operate and maintain these facilities. UNICEF will integrate health education and sanitation practices into existing country programs, focusing particularly on school-age children and informal community education. It plans to spend \$600,000 per year on water and sanitation over the next five years. A portion of the funding (10 percent) has been excluded from the investment analysis to cover educational and training activities. Of the total of \$3 million allocated to water and sanitation activities, \$2.7 million has been included as a firmly committed investment to expand services.

Total funding committed to increase coverage: \$2,700,000

- **USAID**

USAID currently has nine active water and sanitation projects and plans to begin implementing one more within the next year.

The largest of these, the Public Services Improvement Project (PSIP), began in 1989 and contains a \$36.2 million water and sanitation component for rural areas. The bulk of funds will go to the construction of water systems, with some money going to the construction of pit latrines and to health education. The project, which is being implemented by ANDA, is scheduled to run through 1994 and is expected to benefit approximately 600,000 people.

The Oriente 89 Plan is a smaller-scale (\$1.36 million) water system expansion project which, like other USAID efforts, is being implemented by ANDA and various municipalities. The project will increase water system coverage by approximately 70,000 persons in urban areas of eastern El Salvador. Two other USAID-sponsored efforts—the Earthquake Reconstruction Project and the MEA-CONARA Project (National Program for Popular Housing)—also provide for the construction and expansion of water systems in urban areas. Collectively, they will provide coverage to approximately 106,000 people.

Another active program, which targets 230,000 rural and 49,500 urban residents, also sponsors the construction of water and sanitation facilities. The \$9 million Water Supply and Sanitation in Rural Areas Project begun in 1987 will end in 1991.

USAID also funds the Health and Jobs for Displaced Families Project, which will sponsor the construction of a water well for a rural community of 500. This project is being implemented by the International Rescue Committee. USAID supports a second project which involves PVO water and sanitation activity in rural El Salvador. Save the Children's \$900,000 Community-Based Integrated Rural Development Project, which runs from 1989 to 1994, is constructing water and sanitation facilities for 20,000 rural residents.

Finally, USAID is providing \$4 million in counterpart funds to an IDB loan project for the construction of water and sewerage facilities for the metropolitan area of San Salvador. USAID's \$3.75 million Chalatenango 88 Project, which was terminated in 1990, involved the construction of water systems for 70,000 urban residents.

USAID also plans to implement a \$2.8 million Maternal Health/Child Survival Project with a latrine component in 1991. The seven-year effort will be implemented by PVOs and will target 75,000 people. Funding for water and sanitation activities under this project is not yet firmly committed.

Except for the Earthquake Reconstruction Project, which is implemented by the Dirección General de Reconstrucción, and its two rural PVO projects, USAID's projects are implemented by ANDA, with assistance from various municipalities.

Funding for USAID's ongoing projects is as follows:

Project	Start/Completion	Amount
PSIP	1989-1994	\$36,170,000
WS&S in Rural Areas	1987-1991	9,000,000
Oriente 89 Plan	1989-1991	1,360,000
Chalatenango 88	1989-1990	3,750,000
Earthquake Reconstruc.	1987-1990	3,000,000
MEA-CONARA	1989-1991	1,390,000
Int'l Rescue Committee	1988-1991	100,000
Save the Children	1989-1994	900,000
IDB Counterpart Fund	1988-1992	4,000,000
Total		\$59,670,000

An estimate of remaining disbursements under these projects has been included in the funding analysis.

Total funding committed to increase coverage: \$29,060,000

Current Coverage

El Salvador's urban population has relatively high coverage in both water and sanitation, 84 percent and 87 percent, respectively. Most rural Salvadorans, however, have poor access to sanitary facilities. Only 13 percent have access to water service and 40 percent to excreta disposal facilities. These coverage ratios are illustrated in Tables and Figures C-1 and C-2. Coverage for 1990 reflects WASH estimates; however, 1989 coverage has been revised, incorporating figures from a later assessment published in ANDA's Statistical Bulletin.

Meeting the 1995 Urban Water and Sanitation Targets

Although WASH's 1995 target of 82 percent coverage for urban water is lower than the existing coverage of 84 percent, it requires providing service to an additional 159,000 urban residents. The 92 percent target for urban sanitation calls for a 5 percent increase and requires services for 362,000 individuals (Figures C-4 and C-5). To meet these goals, El Salvador will need an investment of approximately \$61 million over the next five years (Table and Figure C-3). Of this total, \$31 million will be necessary for additional water services, and \$30 million to augment sanitation services. Currently, through GOES, IDB, KfW, UNICEF, and USAID investments, approximately \$22 million has been committed. Thus, shortfalls to meet the water and sanitation targets are \$15 million and \$24 million, respectively.

Meeting the 1995 Rural Water and Sanitation Targets

Although coverage in urban areas is above 80 percent for both water and sanitation services, less than 40 percent of rural Salvadorans have access to sanitation services and only 13 percent have access to water supply systems. The difficulty of meeting the targets of 35 percent coverage in water and 52 percent in sanitation is exacerbated by the relatively high population growth in rural areas (3.3 percent). Tables C-1 and C-2, and Figures C-4 and C-5 illustrate the disparity between current coverage and 1995 targets.

To attain the 22 percent gain in coverage required to meet the WASH target, rural water services must be provided to an additional 741,000 people by 1995. In sanitation, an increase of 12 percent, or 550,000 individuals, is necessary to meet the goal of 52 percent coverage. Most of the funding required to meet the 1995 rural water and sanitation goals has been committed by USAID through its Public Services Improvement Project, which will run through 1994 and is expected to benefit 600,000 rural residents, and through the IDB's rural water and sanitation project, which will benefit 230,000 persons. Despite the commitments by these and other donors of almost \$40 million, an additional \$37 million is needed to support the construction of water systems. WASH estimates that, with current commitments for latrine and sewerage programs, slightly more than \$3 million in additional funding will be sufficient to meet the 1995 rural sanitation target.

TABLE C-1

Actual Water Supply Coverage vs. Targets

WATER SUPPLY									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	4,540	2,330	51%	1,900	1,280	67%	2,640	1,050	40%
BASELINE 1984	4,700	2,261	48%	1,980	1,445	73%	2,720	816	30%
1986	4,800	2,081	43%	2,000	1,518	76%	2,800	563	20%
1988	4,934	2,236	45%	2,072	1,864	90%	2,862	372	13%
1989	5,100	2,366	46%	2,500	2,063	83%	2,600	303	12%
* 1990	5,200	2,500	48%	2,550	2,150	84%	2,650	350	13%
TARGETS FOR 1995	5,932	3,400	57%	2,815	2,309	82%	3,117	1,091	35%

Population figures are rounded to the nearest thousand.

** 1990 coverage figures are WASH estimates; actual data were unavailable at the time of this report's production. The breakdown of urban and rural populations has been adjusted to match WASH definitions.*

TABLE C-2

Actual Sanitation Coverage vs. Targets

SANITATION									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	4,540	1,600	35%	1,900	910	48%	2,640	690	26%
BASELINE 1984	4,760	2,355	50%	1,980	1,485	75%	2,720	870	32%
1986	4,800	2,756	57%	2,000	1,772	89%	2,800	984	35%
1988	4,934	2,911	59%	2,072	1,927	93%	2,862	984	34%
1989	5,100	3,118	61%	2,500	2,076	83%	2,600	1,042	40%
* 1990	5,200	3,299	63%	2,550	2,228	87%	2,650	1,071	40%
TARGETS FOR 1995	5,932	4,211	71%	2,815	2,590	92%	3,117	1,621	52%

Population figures are rounded to the nearest thousand.

** 1990 coverage figures are WASH estimates; actual data were unavailable at the time of this report's production. The breakdown of urban and rural populations has been adjusted to match WASH definitions.*

EL SALVADOR URBAN AND RURAL WATER SUPPLY COVERAGE

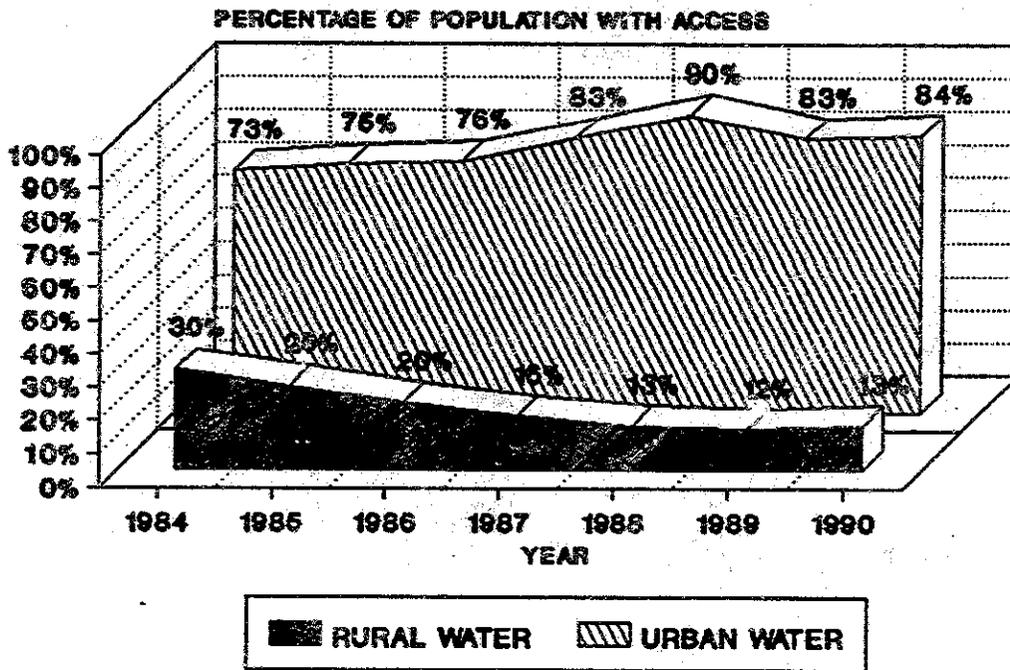


Figure C-1

EL SALVADOR URBAN AND RURAL SANITATION COVERAGE

PERCENTAGE OF POPULATION WITH ACCESS

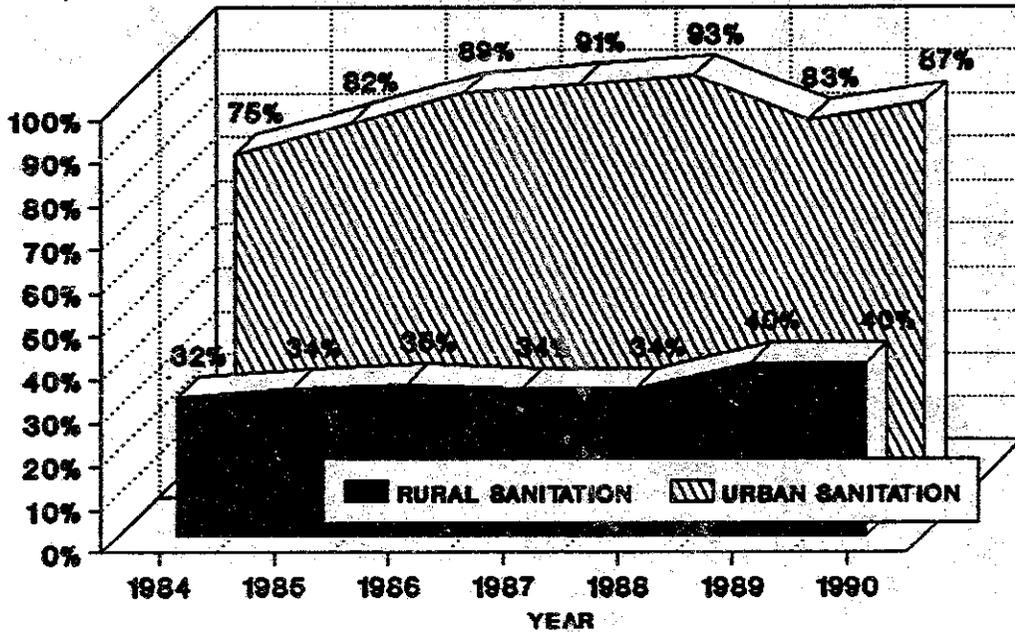


Figure C-2

TABLE C-3

Investment Needed to Meet 1995 Targets (1990 US \$000s)

	WATER SUPPLY COVERAGE (PERSONS—000s)			SANITATION COVERAGE (PERSONS—000s)			TOTAL FUNDING REQUIRED
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	
TARGET FOR 1995 (000s)	3,400	2,309	1,091	4,211	2,590	1,621	N/A
COVERAGE IN 1990	2,500	2,150	350	3,299	2,228	1,071	N/A
REQUIRED INCREASE	900	159	741	912	362	550	N/A
ESTIMATED UNIT COST (US \$ PER CAPITA)	N/A	\$193	96	N/A	84	16	N/A
ESTIMATED TOTAL COST TO MEET 1995 TARGETS (\$000s)	\$101,823	30,687	71,136	39,208	30,408	8,800	141,031
FIRMLY COMMITTED INVESTMENTS (\$000s)*	\$49,998	15,846	34,153	12,188	6,497	5,690	62,186
PROJECTED FUNDING SHORTFALL (\$000s)	\$51,825	14,841	36,983	27,020	23,911	3,110	78,845

* Includes only those investments to increase coverage.

EL SALVADOR INVESTMENT NEEDED TO MEET 1995 TARGETS

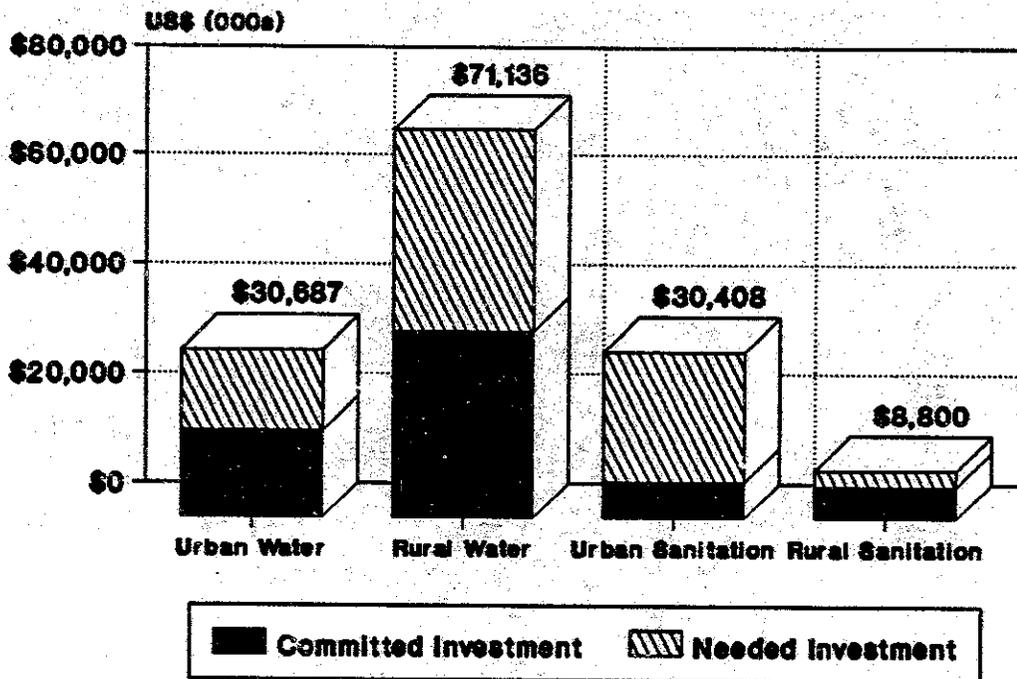


Figure C-3

**EL SALVADOR
1990 COVERAGE AND 1995 TARGETS
(% OF POP.)**

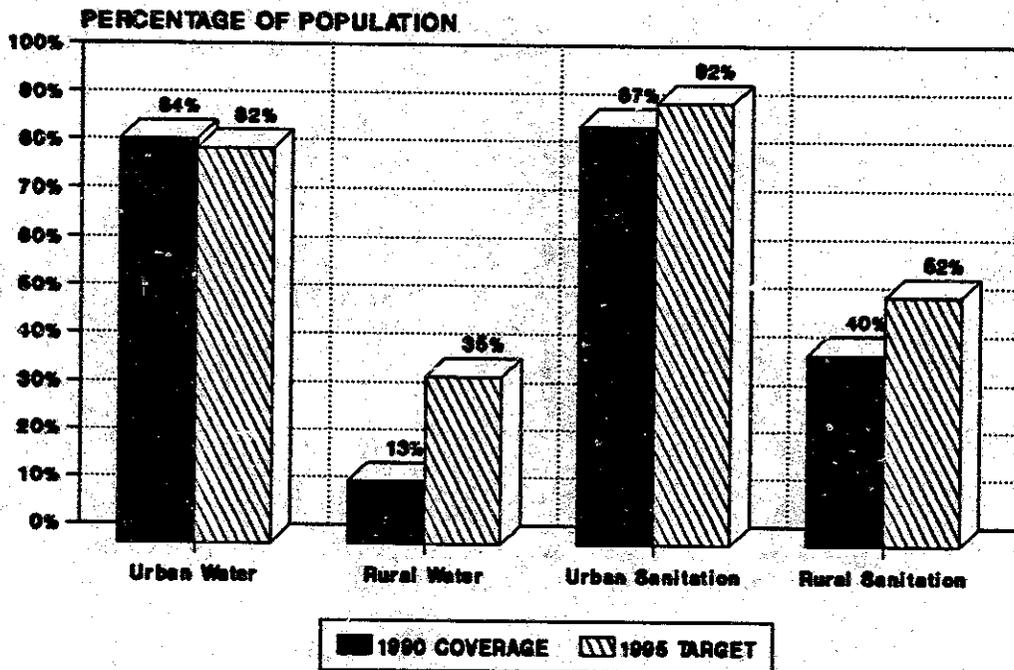


Figure C-4

**EL SALVADOR
1990 COVERAGE AND 1995 TARGETS
(NO. OF PEOPLE)**

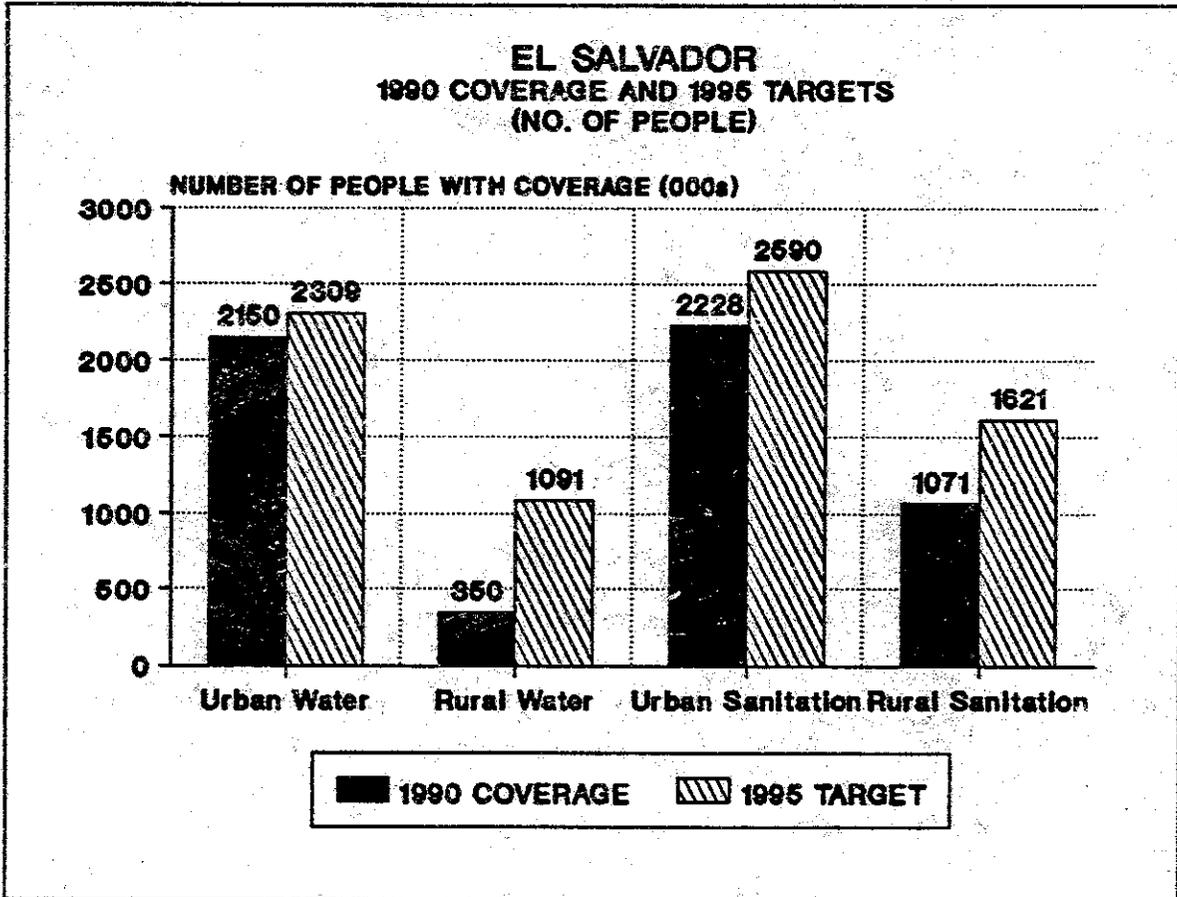
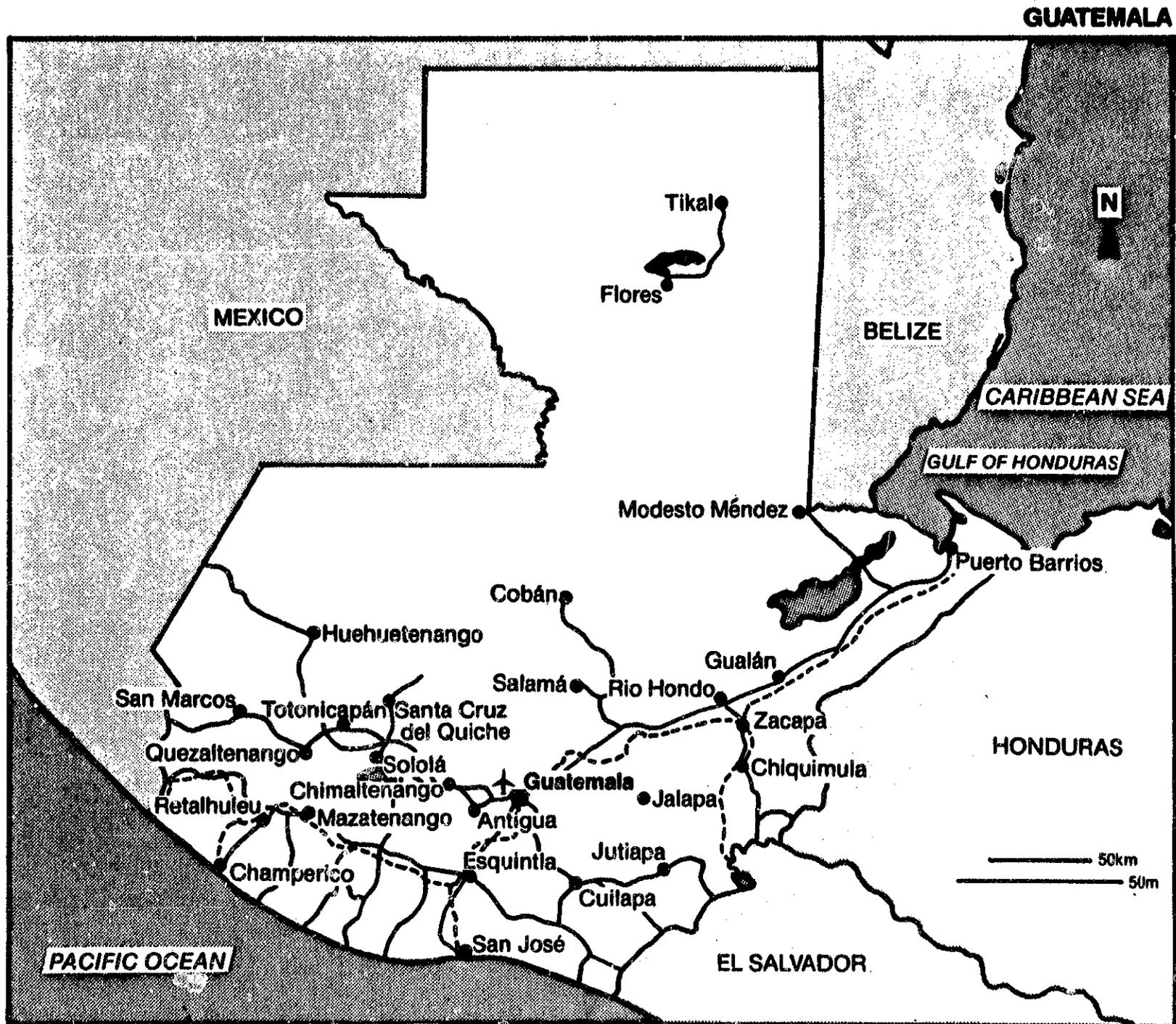


Figure C-5

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APPENDIX D

GUATEMALA

COUNTRY BACKGROUND

With more than 9 million inhabitants, Guatemala is the most populous nation in Central America. It is divided into 22 departments and 300 municipalities and is organized into eight regions, technical districts, and technical areas for the administration of public services.

The Guatemalan economy has begun to recover from the crisis of the early 1980s. GDP growth reached 5 percent in 1989, and the stabilization of the exchange rate after a devaluation in 1986 has reduced inflation. Despite these improvements, according to GEPLAN (Guatemala's General Secretariat of the National Council for Economic Planning), 71 percent of the total population and 84 percent of the rural population live in poverty or extreme poverty, with incomes that do not cover the price of the basic food basket or basic goods and services.

Guatemala City is the most densely populated urban area, while the most densely populated rural areas are in the mountainous region, where most of the Indian population resides. PAHO estimates that 62 percent of Guatemala's population lives in 19,000 localities of fewer than 2,000 residents (90 percent of the country's settlements), which poses problems for access to social services. Access to health services is inadequate for many population groups; PAHO reports that nationwide only 42.9 percent of the population had received medical care prior to death. Water-related diseases are a leading cause of death. The principal causes of infant and child mortality are diarrhea, acute respiratory infection, and malnutrition.

Overall, Guatemalans rank sixth in the region for basic water supply and sanitation service coverage; more than half the population is without access to a water system, and two-thirds lack access to excreta disposal systems. Like other countries in the region, Guatemala faces widespread pollution problems. According to PAHO, an estimated 85 percent of urban water supply systems have some degree of contamination; rural water supplies also suffer from

COUNTRY PROFILE

1990 Population:	9.19 million
	Urban: 3.77
	Rural: 5.43
Population Growth Rate:	Overall: 2.9%
	Urban: 3.0%
	Rural: 2.9%
Infant Mortality Rate:	72
Under 5 Mortality Rate:	91
Mortality Rate due to Infectious and Parasitic Diseases:	211.5
Mortality Rate due to Intestinal and Diarrheal Diseases:	134.0
Life Expectancy:	Male 60, Female 64
Adult Literacy:	55%
GNP per Capita (1989):	\$910
GNP per Capita (\$1988):	\$900
GNP per Capita Annual Growth from 1965-88:	1.0%
Currency:	Quetzal 4.98 = \$1
Average Annual Inflation from 1980-88:	13.3%

quality problems. The country fell far short of meeting the 1990 goals established for the International Drinking Water Supply and Sanitation Decade; substantial investments will be necessary to meet the 1995 WASH goals.

Three local government agencies and two coordinating committees currently serve the water sector. Empresa Municipal de Agua de la Ciudad de Guatemala (EMPAGUA) manages the water supply and sewerage needs of Guatemala City. Instituto de Fomento Municipal (INFOM) is responsible for financing water and sanitation in other urban areas; each municipality is responsible for operating and maintaining facilities. Rural water and sanitation are provided by two units of the Ministry of Public Health—the Environmental Sanitation Division and Unidad Ejecutora del Programa de Acueductos Rurales (UNEPAR). The Comité Permanente de Coordinación de Agua Potable y Saneamiento (COPECAS) determines the regional distribution of water and sanitation activities, while the Comité Nacional de Agua (CONAGUA) determines water and sanitation development policies for the Government of Guatemala.

COVERAGE LEVELS AND INVESTMENT

Current Projects

Water and sanitation service expansion programs currently are funded by CARE, Germany's KfW, UNICEF, and USAID. Disbursements under a number of additional programs financed or planned by the World Bank and the Inter-American Development Bank were suspended in 1990 when Guatemala fell into arrears on its scheduled loan payments. WHO/PAHO and the UNDP are also active in the sector.

- **CARE**

At the close of the 1990 fiscal year, CARE's Community Water and Health Project had provided 30 water systems to benefit approximately 15,000 rural people. The project also provides sanitation education to target communities and is jointly financed by CARE/USA, CARE/Deutschland, and the Ministry of Health. Funding for the coming fiscal year is as follows:

CARE/USA	\$18,000
CARE/Deutschland	\$243,424
MOH	\$4,571
Total	\$265,995

Because the program contains a strong educational and training component, only 90 percent of project funding has been allocated for expansion of services.

Total funding committed to increase coverage:

\$239,396

• **GTZ**

Germany's agency for technical cooperation currently is implementing a pilot project for recycling wastewater and solid waste to protect the environment. The four components of the project are: support for the Comité Nacional para la Protección del Medio Ambiente in the introduction of laws and regulations; support for the Private Committee for the Protection of Lake Amatitlán; compilation of the results of a pilot recycling project in the community of Alameda Norte in Guatemala City; and planning for the treatment of industrial wastewater. The project, started in December 1987, is being executed by the Instituto Centroamericano de Investigación y Tecnología Industrial and is scheduled to run through 1991. Total funding is \$1,004,000.

Total funding committed to increase coverage:

\$0

• **IDB**

In March 1990, Guatemala fell into arrears with the IDB, resulting in the suspension of IDB-financed projects in the country. Prior to this, the IDB was in the final stages of disbursing funds for two projects to rehabilitate and expand water and sanitation facilities in intermediary cities. Total financing for these two projects is \$30.5 million.

Negotiations on a third project for rural water system development have also been suspended. If approved, the project—the fifth phase of earlier IDB activities—will be implemented by UNEPAR. It will construct 100 simple water supply systems and 15,000 latrines and rehabilitate or upgrade 80 water systems, increasing water and sanitation coverage in rural areas by 100,000 persons. The IDB is awaiting a response from the Ministry of Finance on the proposed conditions of the loan. If the loan agreement is signed, the IDB will provide \$32.8 million and the Government of Guatemala will contribute \$4 million.

Since the question of arrears has not been resolved, IDB monies have not been included as committed investment in this analysis.

Total funding committed to increase coverage:

\$0

- **KfW**

Phase I of a four-year rural water and sanitation project financed by the KfW began in 1989 after lengthy contract negotiations. The scope of this project, which is being executed by UNEPAR, has been significantly expanded. This phase will provide water and sanitation systems and hygiene education for between 60 and 80 rural communities. UNEPAR, with the help of the KfW, is preparing an increase in funding from \$7.2 million to \$17.4 million. About one-third of project funding will be provided by the Guatemalan government.

The KfW also plans to finance Phase II, which will fund an additional 60 to 80 projects. Feasibility studies for this project will be prepared in 1991. Although no details currently are available, the KfW anticipates financing will be approximately \$6.7 million.

Total funding committed to increase coverage: \$7,200,000

- **UNDP**

The joint UNDP/World Bank Water and Sanitation Program recently participated in the preparation and appraisal of the water component of the Social Investment Program to be financed by the World Bank. The program has worked with UNICEF to strengthen indigenous capacity for the manufacture of Tara handpumps (renamed Maya pumps by the government) through the transfer of technology and manufacturing techniques. Production capacity currently is 600 pumps per year, which meets only a portion of demand but which the joint program hopes to double.

Total funding committed to increase coverage: \$0

- **UNICEF**

Working with the Ministry of Health's Division of Environmental Sanitation, UNICEF plans to construct water and sanitation systems in 700 rural communities of fewer than 500 inhabitants over the next five years. The program will construct gravity-fed water systems with handpumps and install approximately 40,000 latrines. It will be complemented by health education under the MOH's Education Communication Project for Basic Rural Sanitation, which began in early 1990.

UNICEF will also assist the Interinstitutional Commission for Attention to Poverty Stricken Areas (COINAP) in its work in urban areas, providing water supply facilities for an estimated 40,000 persons in targeted communities. In addition, the program will construct 25 public washing facilities and 500 latrines and will install simplified sewage disposal facilities for 7,500 families and garbage disposal facilities for 1,500 households. As part of the program,

200,000 trees will be planted to improve environmental conditions in these marginal areas. Through this urban program, institutional personnel, health workers, and community leaders will be trained to carry out complementary health, hygiene, and environmental education activities. UNICEF plans to spend \$1 million per year on its water and sanitation program over the next five years. Because of the large allocation to waste treatment and educational programming, only 75 percent of UNICEF's monies for water and sanitation has been included in the analysis.

Total funding committed to increase coverage: \$4 million

• **USAID**

USAID has one ongoing program in the water and sanitation sector and plans to initiate a second in 1991. A third, the decade-long Community Based Integrated Health and Nutrition Project, began in 1980 and ended in 1990. It has provided piped water supply systems and latrines for 327 small rural communities serving 152,000 people in six western departments of the altiplano.

Through a grant to CARE, USAID supports the rural Water, Women, and Health Project which is being executed by UNEPAR. Begun in 1985 and scheduled to run through 1991, the project will provide water systems for 57 rural communities and 31,000 individuals in the western highlands. The project also provides health education to the target population. Of the total of \$3 million committed, \$500,000 will be expended in 1991.

A third project, for highland water and sanitation, is planned to run from 1991 to 1996 and will service 300 small rural communities, providing in-yard water supplies, latrines, and health education to a total of 145,000 beneficiaries.

The funding allocated to these projects is as follows:

	USAID	GOG	Communities
Water, Women & Hlth	\$ 1.5 m	0.8 m	0.7 m
Highland Wtr & San.	\$10 m	5.3 m	2.3 m
Total	\$11.5 m	6.1 m	3.0 m

Total funding committed to increase coverage: \$18,100,000

- **WHO/PAHO**

PAHO's involvement includes the development of supervisory capacity in regional health divisions for the operation of rural water systems. As this does not directly increase coverage, PAHO expenditures have not been included in the funding analysis.

Total funding committed to increase coverage:

\$0

- **World Bank**

Disbursements to the Water Supply Rehabilitation Project were suspended in March 1990 when Guatemala fell into arrears with its payments to the IBRD, and project activity has slowed considerably in consequence. Under this project, consultants provide assistance to improve the organizational, managerial, operational, technical, administrative, and financial functions of EMPAGUA. The government has committed \$7 million in counterpart funds to supplement a \$23 million IBRD loan. Technical assistance to EMPAGUA is continuing despite the suspension of disbursements, which total \$4.2 million to date.

Another Bank-sponsored project, the Social Investment Program, which was prepared in 1990, is awaiting resolution of the arrears situation. The project is expected to total \$93 million, of which 45 percent will be dedicated to water and sanitation. It will run for three to five years and will finance the construction of approximately 600 water systems in dispersed rural areas. Depending on the outcome of the January 1991 elections and the implications for resolving the question of arrears with the IBRD, the project will be reappraised in early 1991.

Because none of this funding has been firmly committed, neither project has been included in the investment analysis.

Total funding committed to increase coverage:

\$0

Current Coverage

With 92 percent water coverage in urban areas and only 31 percent in rural regions, Guatemala shows the same bias towards urban communities that most other countries in the region do. Similarly, 72 percent of urban Guatemalans have access to sanitary waste disposal facilities, while only 33 percent of the rural population is covered. Current coverage is shown in Figures and Tables D-1 and D-2, which indicate that coverage in urban areas deviates from the trend shown by historical data for 1980-1989. This change is the result of an adjustment in coverage estimates to account for urban populations served by public standpipes rather than household connections, as well as those served by latrines. Neither

of these types of coverage was included in previous estimates. The figures in this report were provided by UNICEF.

Revised 1995 Targets

WASH's targets for urban water and sanitation have been revised to reflect changes in coverage trends incorporated in this report. The new targets result from the adjustments described above and were calculated, as outlined in Chapter 1, by estimating the progress required by 1995 to attain full coverage by 2020. Tables D-1 and D-2 show the revised targets.

Meeting the 1995 Urban Water and Sanitation Targets

WASH's targets of 93 percent coverage in urban water services and 77 percent coverage for urban sanitation require large increases in the numbers of individuals with adequate services. The targets call for an additional 617,000 urban residents with access to water and 642,000 with sanitation facilities (Tables D-1 and D-2, Figures D-4 and D-5). With the suspension of IBRD and IDB activities in the country, firm external commitments currently focus on developing services in rural areas. UNICEF is the sole source of firm external commitments to the urban subsectors; WASH has estimated UNICEF's support at \$2 million over the next five years. As shown in Table and Figure D-3, there is a shortfall of \$57.5 million for urban water and \$61 million for urban sanitation.

Meeting the 1995 Rural Water and Sanitation Targets

Reaching the WASH targets in the rural sector will require even greater increases in the number of individuals served than in the urban areas. These increases are shown in Tables 1 and 2 and in Figures 4 and 5. An estimated 1,109,000 individuals must be provided with access to drinking water by 1995 to raise the current level of 31 percent coverage to the WASH target of 44 percent. To reach the goals for sanitation coverage, 1,103,000 rural Guatemalans must gain access to at least basic sanitation, increasing coverage to 46 percent. Table and Figure D-3 show the estimated investment needed. WASH estimates that Guatemala will require \$133 million for expanding rural water services and \$16 million for sanitation. (The disparity between the two subsectors is largely explained by the differences in unit costs: the estimated unit cost for expanding water services is eight times greater than for sanitation.) This results in a gap of more than \$122 million between current commitments (an estimated \$25 million for water and \$3 million for sanitation) and required funding. More specifically, Guatemala faces shortfalls of \$109 million in rural water and \$14 million in rural sanitation investments.

If the arrears situation with the World Bank and the IDB is resolved, an additional \$79 million in project financing for improving and expanding services in rural areas may become available, substantially reducing the projected deficit.

TABLE D-1

Actual Water Supply Coverage vs. Targets

WATER SUPPLY									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	7,000	3,200	46%	2,700	2,400	89%	4,300	800	19%
BASELINE 1984	7,800	3,500	45%	3,100	2,300	74%	4,700	1,200	26%
1986	8,196	3,700	45%	3,357	2,400	71%	4,839	1,300	27%
1988	8,682	3,880	45%	3,552	2,450	69%	5,130	1,430	28%
1989	8,935	4,152	46%	3,663	2,577	70%	5,272	1,575	30%
* 1990	9,197	5,121	56%	3,771	3,462	92%	5,426	1,659	31%
TARGETS FOR ** 1995	10,662	6,846	64%	4,372	4,079	93%	6,290	2,768	44%

Population figures are rounded to the nearest thousand.

*** A revised 1995 target for urban water has been developed to take the adjustment in coverage into account.*

TABLE D-2

Actual Sanitation Coverage vs. Targets

SANITATION									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	7,000	2,100	30%	2,700	1,200	44%	4,300	900	21%
BASELINE 1984	7,800	2,600	33%	3,100	1,300	42%	4,700	1,300	28%
1986	8,196	2,800	34%	3,357	1,400	42%	4,839	1,400	29%
1988	8,682	3,000	35%	3,552	1,450	41%	5,130	1,550	30%
1989	8,935	3,305	37%	3,663	1,610	44%	5,272	1,695	32%
* 1990	9,197	4,506	49%	3,771	2,715	72%	5,426	1,791	33%
TARGETS FOR ** 1995	10,662	6,251	59%	4,372	3,357	77%	6,290	2,894	46%

Population figures are rounded to the nearest thousand.

* Coverage data prior to 1990 did not include latrines in urban areas. 1990 coverage figures are estimates based on UNICEF data.

** A revised 1995 target for urban sanitation has been developed to take the adjustment in coverage into account.

GUATEMALA URBAN AND RURAL WATER SUPPLY COVERAGE

PERCENTAGE OF POPULATION WITH ACCESS

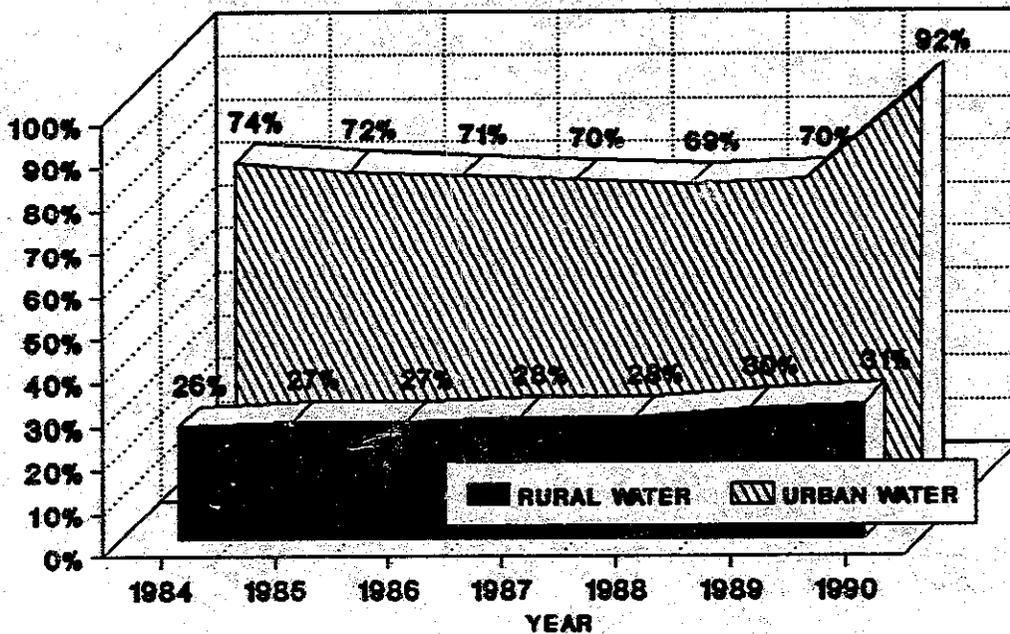


Figure D-1

GUATEMALA URBAN AND RURAL SANITATION COVERAGE

PERCENTAGE OF POPULATION WITH ACCESS

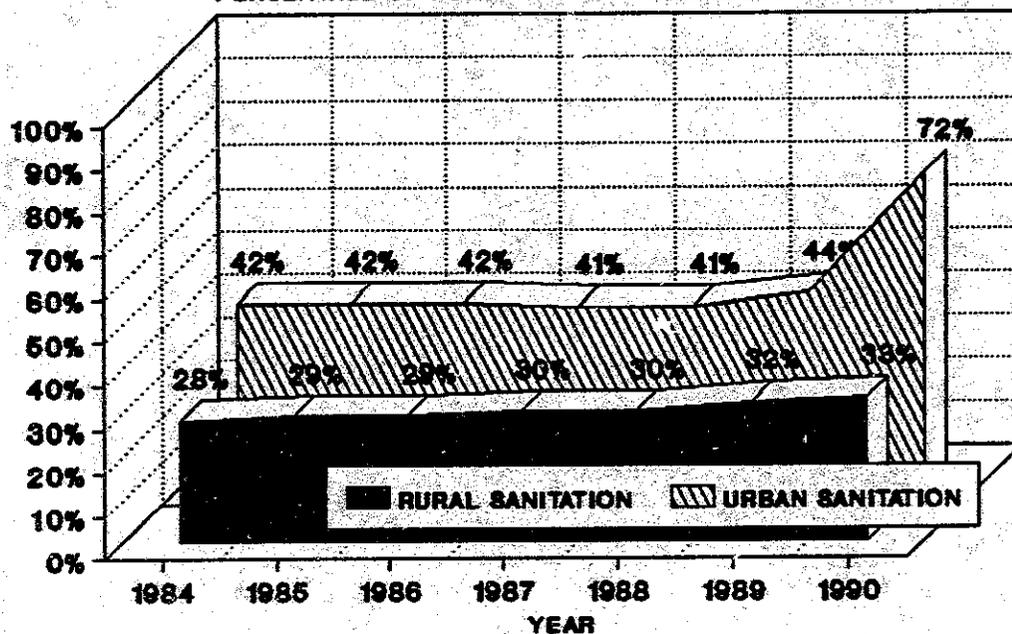


Figure D-2

TABLE D-3

Investment Needed to Meet 1995 Targets (1990 US \$000s)

	WATER SUPPLY COVERAGE (PERSONS—000s)			SANITATION COVERAGE (PERSONS—000s)			TOTAL FUNDING REQUIRED
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	
TARGET FOR 1995 (000s)	6,847	4,079	2,768	6,251	3,357	2,894	N/A
COVERAGE IN 1990	5,121	3,462	1,659	4,506	2,715	1,791	N/A
REQUIRED INCREASE	1,726	617	1,109	1,745	642	1,103	N/A
ESTIMATED UNIT COST (US \$ PER CAPITA)	N/A	\$85	\$120	N/A	\$97	\$15	N/A
ESTIMATED TOTAL COST TO MEET 1995 TARGETS (\$000s)	\$185,525	52,445	133,080	78,819	62,274	16,545	264,344
FIRMLY COMMITTED INVESTMENTS (\$000s)*	\$25,495	934	24,561	4,044	1,066	2,978	29,539
PROJECTED FUNDING SHORTFALL (\$000s)	\$160,030	51,511	108,519	74,775	61,208	13,567	234,805

* Includes only those investments to increase coverage.

GUATEMALA INVESTMENT NEEDED TO MEET 1995 TARGETS

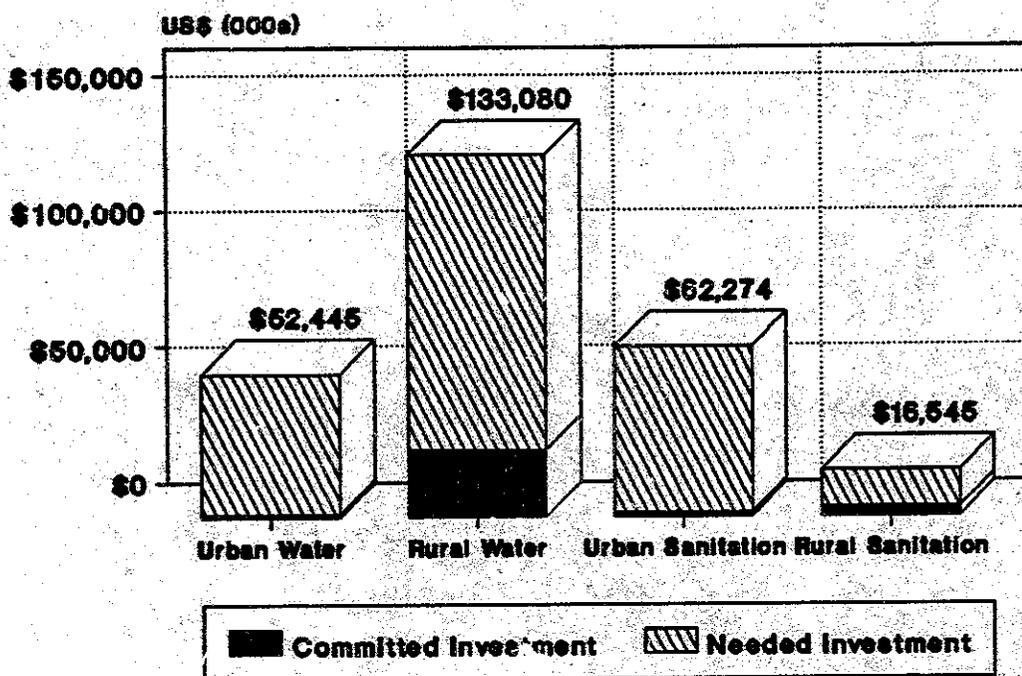


Figure D-3

**GUATEMALA
1990 COVERAGE AND 1995 TARGETS
(% OF POP.)**

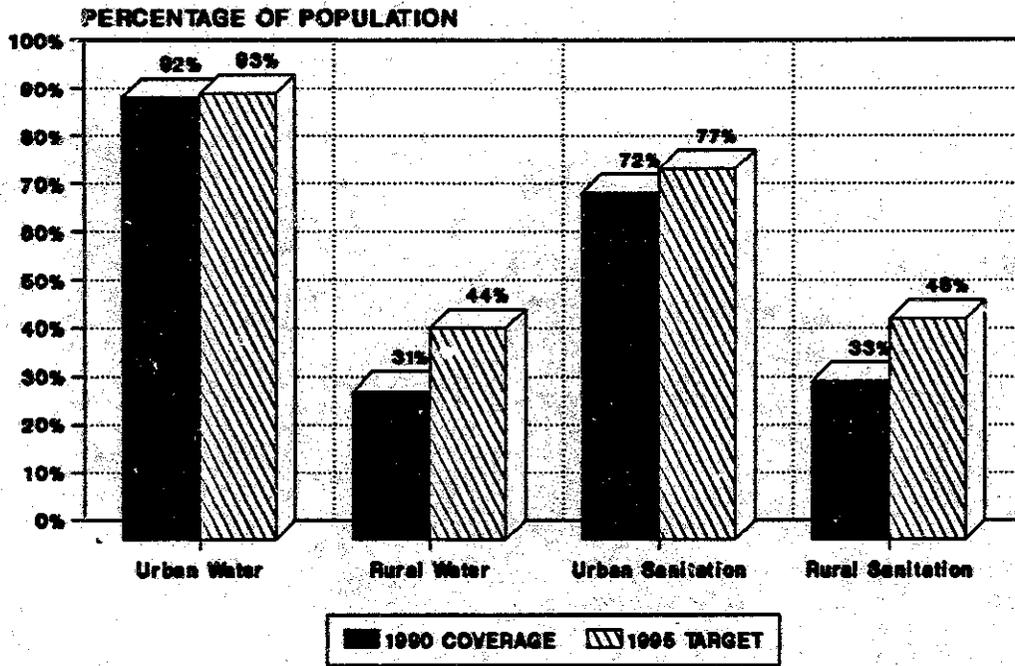


Figure D-4

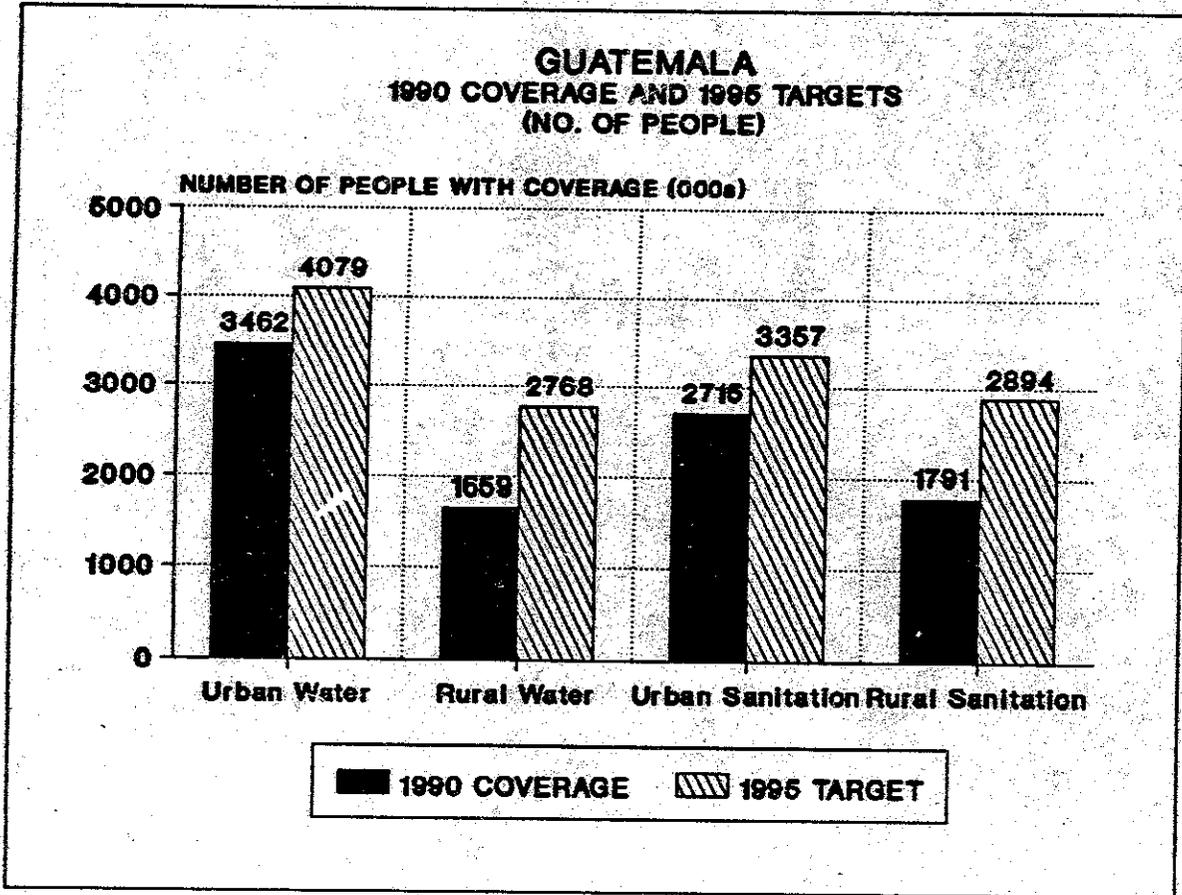
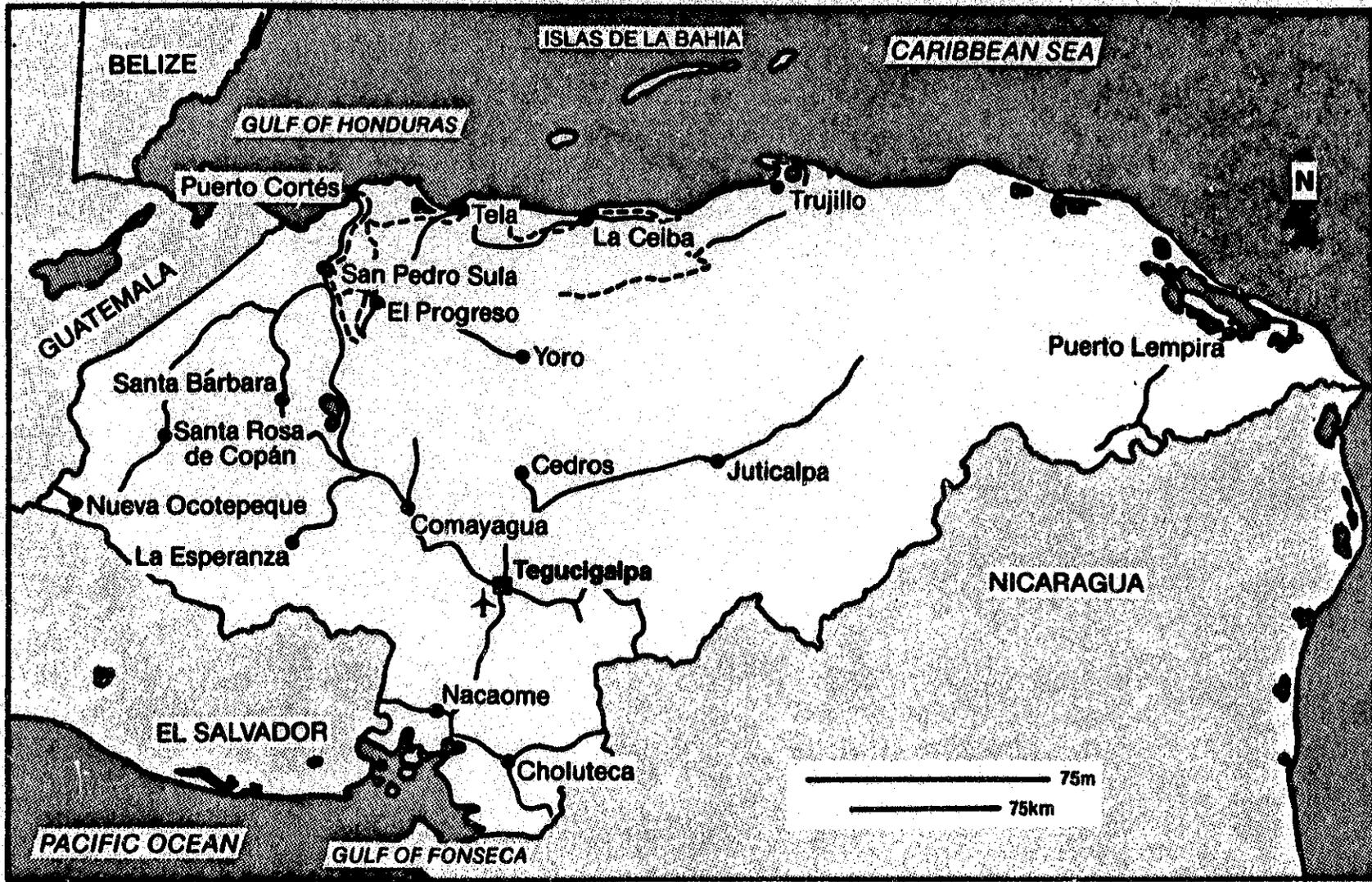


Figure D-5

HONDURAS



APPENDIX E

HONDURAS

COUNTRY BACKGROUND

Honduras, with 112,088 square kilometers of land and 4.8 million inhabitants, has the fastest growing population in the region. Despite a significantly higher growth rate for urban areas, almost 60 percent of the population resides in rural zones. The rapid population growth has meant that the economy has been unable to absorb the labor supply. Unemployment persists at rates above 20 percent; underemployment is even higher.

Despite reductions in mortality and morbidity rates, current data attest to the need for additional investment in health care coverage. Intestinal and respiratory infections, followed by diarrheal diseases, are the leading causes of death. High incidences of diarrheal and intestinal diseases occur in rural and peri-urban areas lacking primary health care and adequate water and sanitation facilities. The infant mortality rate, exacerbated by these conditions, remains one of the highest in Central America. According to PAHO, in 1983, 69 percent of registered deaths from diarrhea occurred in children under the age of 5.

Over the past decade, Honduras has made some advances in improving environmental conditions. More investments are needed, however, to develop satisfactory conditions in solid waste disposal, surface water pollution, and industrial waste management.

The Servicio Autónomo Nacional de Acueductos y Alcantarillados (SANAA) is responsible for water and sanitation services for communities with populations over 500. Smaller villages are serviced by the Bureau of Environmental Health (DSM), a department of the Ministry of Health. Within the definitional framework of this report, in which rural areas are defined as communities of fewer than 2,000 residents, both SANAA and DSM work in the rural sector. Additionally, in several Honduran cities, municipal water and sewerage institutions have been established to operate and maintain services.

COUNTRY PROFILE

1990 Population:	4.78 million
	Urban: 1.95
	Rural: 2.82
Population Growth Rate:	Overall: 2.8%
	Urban: 4.9%
	Rural: 2.4%
Infant Mortality Rate:	61
Under 5 Mortality Rate:	98
Mortality Rate due to Infectious and Parasitic Diseases:	80.9
Mortality Rate due to Intestinal and Diarrheal Diseases:	50.5
Life Expectancy:	62
Adult Literacy:	68%
GNP per Capita (1989):	\$900
GNP per Capita (\$1988):	\$860
GNP per Capita Annual Growth from 1965-88:	0.6%
Currency:	Lempiras 5.55 = \$1
Average Annual Inflation from 1980-88:	4.7%

COVERAGE LEVELS AND INVESTMENT

Current Projects

A total of 12 external institutions and governments currently are active in the water and sanitation sector. Although a substantial portion of the funding committed by these groups will rehabilitate or improve existing systems, Honduras ranks first among the countries in this study for current investments to increase coverage.

- **CIDA**

CIDA has approved \$4.3 million for a four-year water and sanitation project in the Olancho region. The project will run from 1991 to 1995 and will provide new services to 75 communities of 22,000 to 28,000 inhabitants. In addition to the construction of gravity-fed water systems, latrines, and simple wastewater disposal systems, the project will focus on community organization, developing water management committees for ongoing maintenance. Total funding for the project is \$6.4 million, of which approximately \$1.25 million in counterpart funds will be provided by the Government of Honduras (GOH) and SANAA and \$850,000 by the beneficiary communities.

CIDA also funded a three-year \$3 million rural water project which ended in 1990. CARE/Canada was responsible for implementing the project, which served 90 communities and 34,000 people across the country.

Through the Canada Fund, CIDA will continue to finance small-scale water and sanitation projects in response to requests from communities.

Total funding committed to increase coverage: \$6,400,000

- **European Economic Community**

The EEC is supporting a five-year rural water project. Project start-up has been hampered by an inability to acquire construction materials. The project began in 1989 and is scheduled to run through 1994, with EEC funds of \$16.5 million and counterpart GOH funds of \$7 million.

Total funding committed to increase coverage: \$20,000,000

• **IDB**

The IDB funds three water and sanitation programs. The Potable Water for Four Cities Project sponsors a wide range of water system expansions and improvements for the mid-sized cities of Tela, Siguatepeque, La Paz-Cane, and Juticalpa. Approximately 110,000 persons will benefit from the project. The total estimated cost is \$30 million, of which the IDB is providing \$24 million in loan financing. SANAA is responsible for executing the project, which began in June 1985 and is scheduled to terminate in July 1991. To date, \$18.7 million has been disbursed.

The second IDB loan provides for rehabilitation, improvements, and expansion of the Tegucigalpa water system, which will benefit a population of approximately 800,000. Another SANAA-executed project, its cost is estimated at \$60 million. The IDB has provided a \$54 million loan, and as of November 1990, \$14.5 million had been disbursed.

The third project, Rural Water System II, covers construction of approximately 180 water systems, as well as 18,000 latrines and 150 septic tanks, to benefit 250 communities, or approximately 202,000 persons. The project also involves sanitation education within the beneficiary communities, institutional strengthening in operation and maintenance, and the preparation of additional project studies and designs. SANAA began work on this five-year project in 1986. Of the \$27 million approved (\$24 million from the IDB), \$16.9 million has been expended to date.

As funds from the Four Cities and Tegucigalpa loans mainly support rehabilitation, only a fraction of these loans has been credited towards increasing coverage. The rural water supply project, however, has been included in its entirety.

Total funding committed to increase coverage: \$16,761,000

• **Italy and France**

The Governments of Italy and France are sponsoring the construction of a concrete dam, a water treatment plant, and transmission lines (from the dam to the plant) for the city of Tegucigalpa. The reservoir and treatment plant will serve residents of Tegucigalpa already linked to the distribution system. The Italians are building the dam and installing the pipelines, and the French are purchasing the equipment. The dam was scheduled to be completed by the end of 1990, though construction, which began in January 1989, has been slowed by SANAA's financing problems. Funding for the project, which will cost approximately \$103 million, has not been included in the investment analysis because it does not contribute to the extension of services.

Total funding committed to increase coverage: \$0

• **JICA**

The Japanese International Cooperation Agency has committed \$10 million to a rural water supply and irrigation project, with the Government of Honduras providing an additional \$2 million. The project, which will run from 1989 to 1994, consists of water studies and well drilling in rural areas. As the project is in part devoted to providing water for irrigation purposes, only a portion of the overall project funds has been included in the investment analysis.

Total funding committed to increase coverage: \$6,000,000

• **KfW**

SANAA is implementing a KfW-financed project for improving existing water systems, constructing gravity-fed water systems, well-drilling, and hygiene education in 50 rural communities. About one-third of the \$6.7 million loan has been expended on the project, which is in its second year of execution. The government and the beneficiary communities are providing approximately one-third of the funds, which might be increased by \$3.3 million.

The KfW is in the process of appraising a water supply and sanitation project for the city of Danli, funding for which, if approved, is envisaged at \$10 million. KfW financing has also been provided for a feasibility study of water supply and sanitation improvement projects in the cities of Choluteca, Marcovia, and San Lorenzo.

Total funding committed to increase coverage: \$4,467,000

• **Switzerland**

The Swiss are working in the departments of Cortés and Yoro, among the poorest areas in the country. Targets for the project, which will run from 1989 to 1991, include the construction of 40 water systems, 165 wells, 4,000 dry-pit latrines, and 6,000 water-seal latrines. Overall, the project will provide 37,000 inhabitants with water and 67,000 with sanitation. The Swiss have provided a grant of \$1.75 million and the Ministry of Health has contributed \$800,000. A pool of funding estimated for the final year of project disbursements has been included in the analysis.

Total funding committed to increase coverage: \$850,000

• **UNICEF**

In collaboration with SANAA, UNICEF plans to continue its efforts to benefit 15,000 slum residents in 30 marginal barrios of Tegucigalpa. The project will establish autonomous water cooperatives for each water system constructed, and these cooperatives will be charged for operation and maintenance. Within four years, through investment-recovery schemes, the communities served by the system will repay the costs of the project, establishing a revolving fund to help finance projects in other marginal urban communities. The project will install a variety of latrines designed for use in urban areas and will develop and implement a comprehensive social communication campaign. To protect the basins which supply water to the city of Tegucigalpa, UNICEF will also undertake reforestation in these areas.

UNICEF will also collaborate with an NGO, Agua para el Pueblo, to extend water and sanitation services for approximately 40,500 rural inhabitants in the departments of Valle, La Paz, Intibucá, and Lempira. The NGO will be responsible for implementing the project, which will construct hand-drilled wells fitted with handpumps, gravity-fed water systems, and latrines. Community-level training will be complemented by health, hygiene, and environmental education channeled through area schools.

A portion of UNICEF's contribution of \$700,000 per year to these efforts for the next five years will support education, training, and reforestation efforts.

Total funding committed to increase coverage: \$3,000,000

• **USAID**

USAID supports two water and sanitation projects benefiting nearly 400,000 people. The Health Sector II Project, which seeks to build on the achievements of USAID's earlier water and sanitation efforts, will serve 360,000 rural residents. The \$32 million project will construct 530 water supply systems, 1,600 wells, and a network of latrines. It is scheduled to run from mid-1988 through 1995 and focuses on nine northern departments (Ocotepeque, Copán, Lempira, Santa Barbara, Cortés, Yoro, Atlantida, Colón, and Bay Islands). Through USAID-funded PVO activity, the project will also sponsor water and sanitation development in the other nine departments of Honduras. Over the past several years, a number of PVOs have implemented small rural water and sanitation projects with financial support from this project. The project currently supports activities being implemented by Save the Children, Catholic Relief Services, and FEHDECO, a Honduran PVO. USAID has committed \$18 million and the GOH has contributed \$14 million in counterpart funds. The project is being implemented by SANAA and the MOH.

The second project, RHUDO/ROCAP's Shelter Sector and Urban Development Program, targets 31,524 families in the two principal cities, Tegucigalpa and San Pedro Sula, and the

five main secondary cities, La Ceiba, Tela, Siguatepeque, Comayagua, and Choluteca. The program, planned for execution between 1987 and 1991, is contributing both on- and off-site water and sanitation facilities. The on-site facilities are supported by \$25 million in Housing Guaranty funds, and the off-site facilities by \$7.5 million in ESF counterpart funds. The National Housing Fund (FOVI) and municipal governments are responsible for implementing the program, which seeks to improve the private sector's institutional capacity for providing housing and to give municipal governments hands-on experience in building an infrastructure for low-income families. Estimated funding for on-site construction (user facilities) in 1991 has been included in the analysis.

USAID support is also provided through the Employment Generation Program, under which approximately \$5.9 million will be disbursed for water and sanitation in 1991 and 1992. The project is supported by host country-owned currency and is funded through the Honduras Social Investment Fund (FHIS). The program finances the construction of water and sanitation facilities across the country as a means to offset the impact of the economic stabilization program by expanding infrastructure services and by increasing employment. Over the next two years, the program plans to provide water supply services to 22,033 and sanitation services to 73,094 persons. FHIS, SANAA, various municipalities and a number of PVOs are responsible for the implementation and oversight of activities funded through this program.

Total funding committed to increase coverage: \$27,950,000

• **WHO/PAHO**

PAHO plans to implement a \$350,000 project for training rural "juntas de agua" over the next few years. Proposals for the project are being submitted to potential donors. This effort will provide institutional development and will not expand coverage.

Total funding committed to increase coverage: \$0

• **World Bank**

Implementation of the jointly financed World Bank/Commonwealth Development Corporation Water Supply and Drainage Project for San Pedro Sula has been halted by the suspension of disbursements in late 1988. Though the Bank has now lifted the suspension, its co-financier has not, pending clearance of arrears. As a result of the long period of inactivity, the project costs and financing plan are being updated, and the project, originally planned for \$42.5 million, may be modified before implementation is fully reactivated. IBRD financing for the project originally was approved at \$19.6 million. Technical assistance to DIMA, the municipality of San Pedro water authority, which is responsible for implementing

the project in cooperation with SANAA, is expected to restart shortly. As this project focuses primarily on rehabilitation and improvement, only a portion of the funds allocated to the project will provide service expansion. Though new funding levels are uncertain, WASH has included a total of \$1 million in the investment analysis.

Total funding committed to increase coverage: \$1,000,000

Current Coverage

In 1990, 84 percent of the urban population and 59 percent of rural inhabitants had access to water supply service. Sanitation services were available to 82 percent of urban and 67 percent of rural residents. Although the number of urban residents with access to water and sanitation services increased between 1989 and 1990, the percentage levels of coverage declined as a result of the 4.9 percent urban growth rate. Small gains were made in both the numbers and percentages of the rural population covered. Figures 1 and 2 illustrate coverage between 1984 and 1990.

Meeting the 1995 Urban Water and Sanitation Targets

Approximately 677,000 persons will require access to sanitation facilities to meet the target of 92 percent coverage by 1995. The drinking water target of 94 percent, which also requires a 10 percent increase in coverage, calls for providing 698,000 with access (Tables 1 and 2, Figures 4 and 5). With approximately \$17 million committed for urban water and sanitation from 1991 to 1995, Honduras will require an additional \$208 million (\$56.7 for water and \$151.6 for sanitation) to reach the WASH targets (Table and Figure E-3). This funding requirement is the largest for the urban sector of all the countries included in this report.

Meeting the 1995 Rural Water and Sanitation Targets

To attain 66 percent coverage by 1995, an additional 444,000 rural residents must be provided with a water supply system. As shown in Figures E-4 and E-5, the sanitation target of 74 percent coverage requires an increase of 473,000 (see also Tables E-1 and E-2). As shown in Table and Figure E-3, the funding required, like that for urban services, is substantial, but, given the lower unit costs to provide services in rural areas, it is significantly less than the urban requirement. Approximately \$37 million is needed for water systems and \$13 million for sanitation facilities. Based on these estimates, the current levels of investment should be sufficient to meet the WASH targets.

TABLE E-1

Actual Water Supply Coverage vs. Targets

WATER SUPPLY									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	3,754	2,226	59%	1,368	1,272	93%	2,386	954	40%
BASELINE 1984	4,299	2,726	63%	1,700	1,405	83%	2,599	1,321	51%
1986	4,581	2,983	65%	1,884	1,533	81%	2,697	1,450	54%
1988	4,377	3,054	70%	1,669	1,619	97%	2,708	1,435	53%
1989	4,534	3,159	70%	1,740	1,594	92%	2,794	1,565	56%
1990	4,771	3,282	69%	1,948	1,628	84%	2,823	1,654	59%
TARGETS FOR 1995	5,653	4,424	78%	2,474	2,326	94%	3,178	2,098	66%

Population figures are rounded to the nearest thousand.

TABLE E-2

Actual Sanitation Coverage vs. Targets

SANITATION									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	3,754	1,290	37%	1,368	670	49%	2,386	620	26%
BASELINE 1984	4,299	2,560	60%	1,700	1,349	79%	2,599	1,211	47%
1986	4,581	2,877	63%	1,884	1,485	79%	2,697	1,392	52%
1988	4,377	3,068	70%	1,669	1,552	93%	2,708	1,516	56%
1989	4,534	3,379	75%	1,740	1,535	88%	2,794	1,844	66%
1990	4,771	3,478	73%	1,948	1,599	82%	2,823	1,879	67%
TARGETS FOR 1995	5,653	4,628	82%	2,474	2,276	92%	3,178	2,352	74%

Population figures are rounded to the nearest thousand.

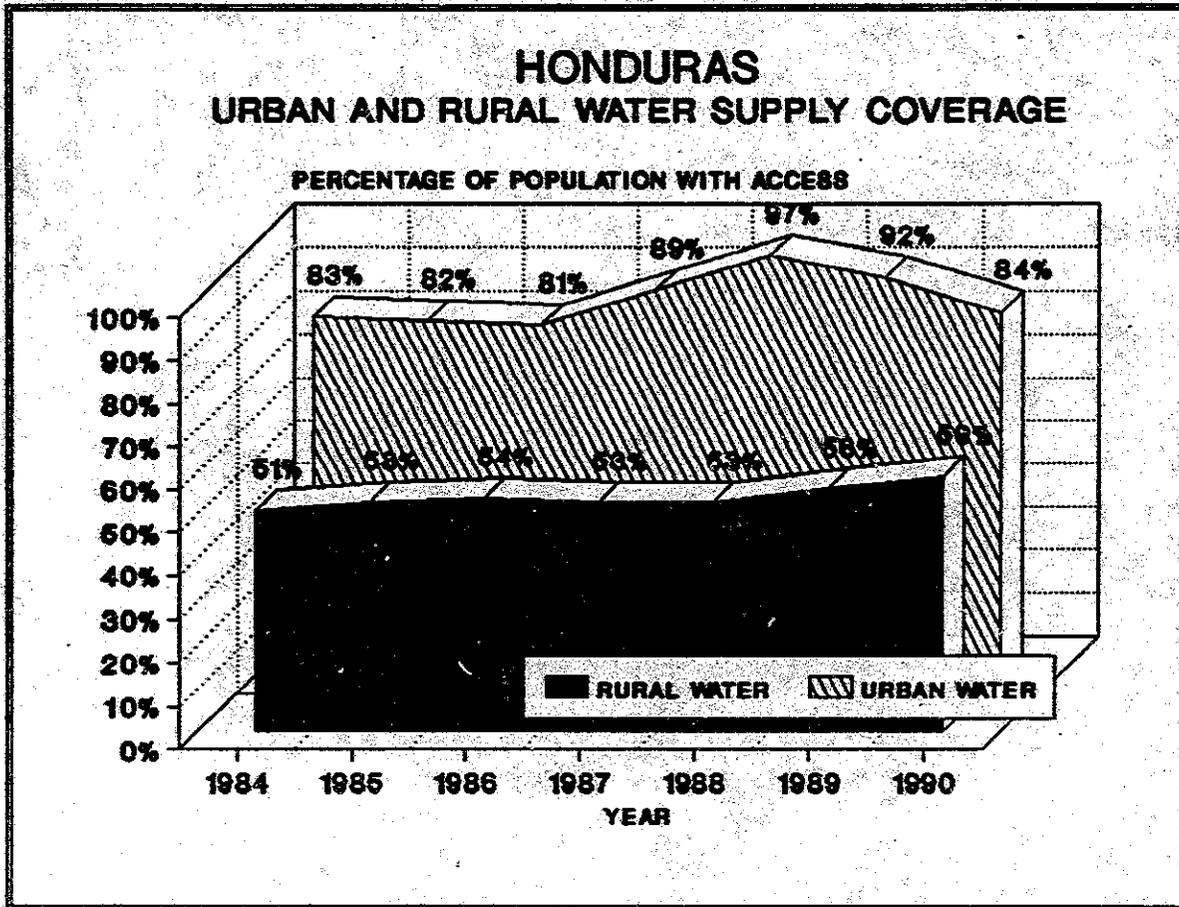


Figure E-1

HONDURAS URBAN AND RURAL SANITATION COVERAGE

PERCENTAGE OF POPULATION WITH ACCESS

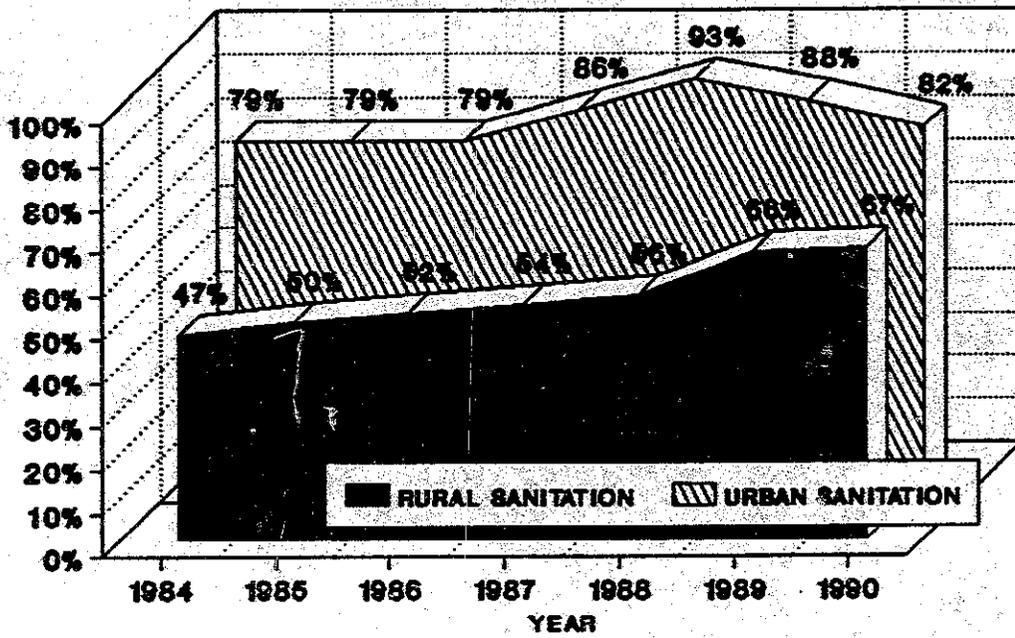


Figure E-2

TABLE E-3

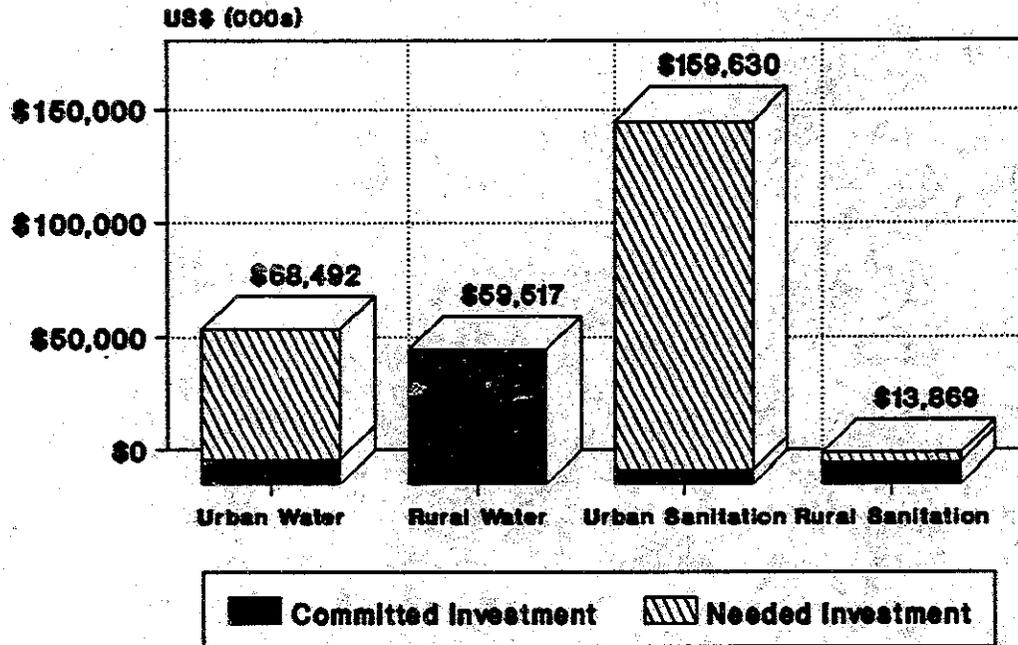
Investment Needed to Meet 1995 Targets (1990 US \$000s)

	WATER SUPPLY COVERAGE (PERSONS—000s)			SANITATION COVERAGE (PERSONS—000s)			TOTAL FUNDING REQUIRED
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	
TARGET FOR 1995 (000s)	4,424	2,326	2,098	4,628	2,276	2,352	N/A
COVERAGE IN 1990	3,282	1,628	1,654	3,478	1,599	1,879	N/A
REQUIRED INCREASE	1,142	698	444	1,150	677	473	N/A
ESTIMATED UNIT COST (US \$ PER CAPITA)	N/A	97	84	N/A	233	28	N/A
ESTIMATED TOTAL COST TO MEET 1995 TARGETS	\$105,002	67,706	37,296	170,985	157,741	13,244	275,987
FIRMLY COMMITTED INVESTMENTS (000s) *	\$70,515	10,998	59,517	15,913	6,113	9,800	86,428
PROJECTED FUNDING SHORTFALL (\$000s) **	\$56,708	56,708	(22,221)	155,072	151,628	3,444	211,780

* Includes only those investments to increase coverage.

** The shortfall calculation assumes that any funds which exceed the requirements to meet WASH targets will remain allocated within the subsector, allowing coverage to exceed the 1995 targets.

HONDURAS INVESTMENT NEEDED TO MEET 1995 TARGETS



Commitments for Rural Sector
Exceed Requirements

Figure E-3

HONDURAS 1990 COVERAGE AND 1995 TARGETS (% OF POP.)

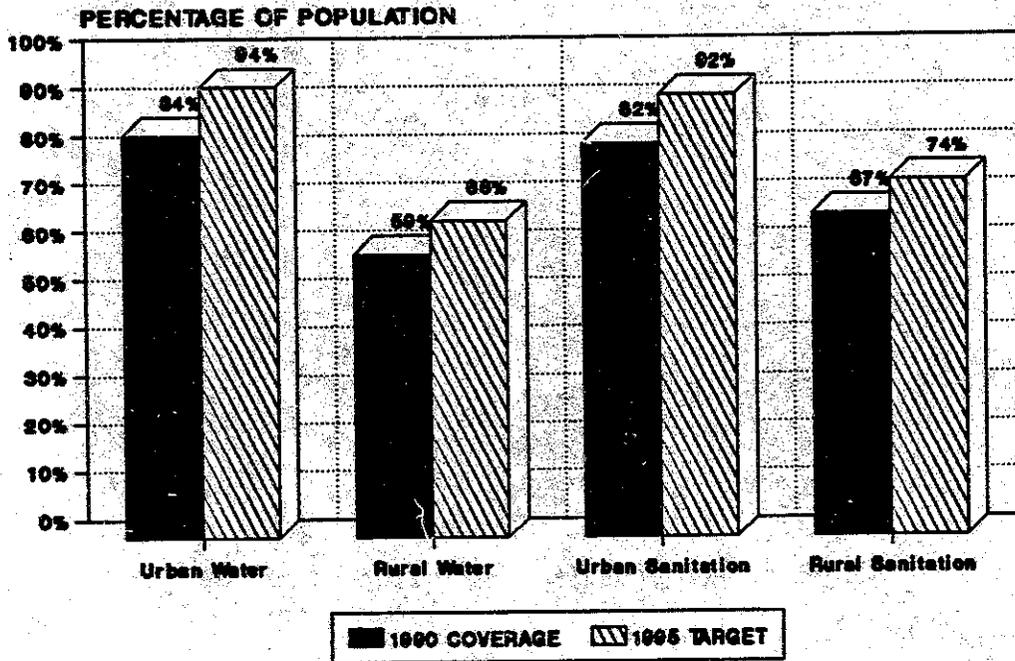


Figure E-4

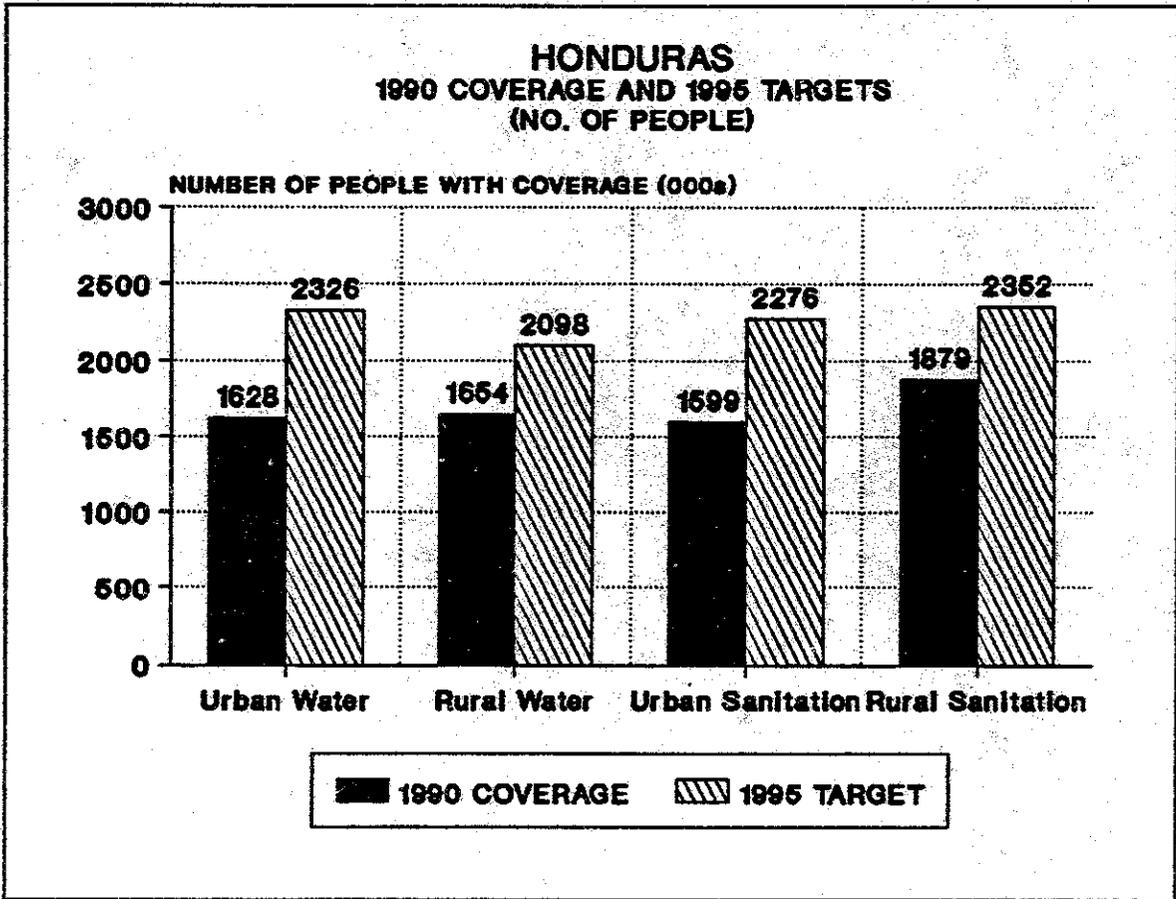
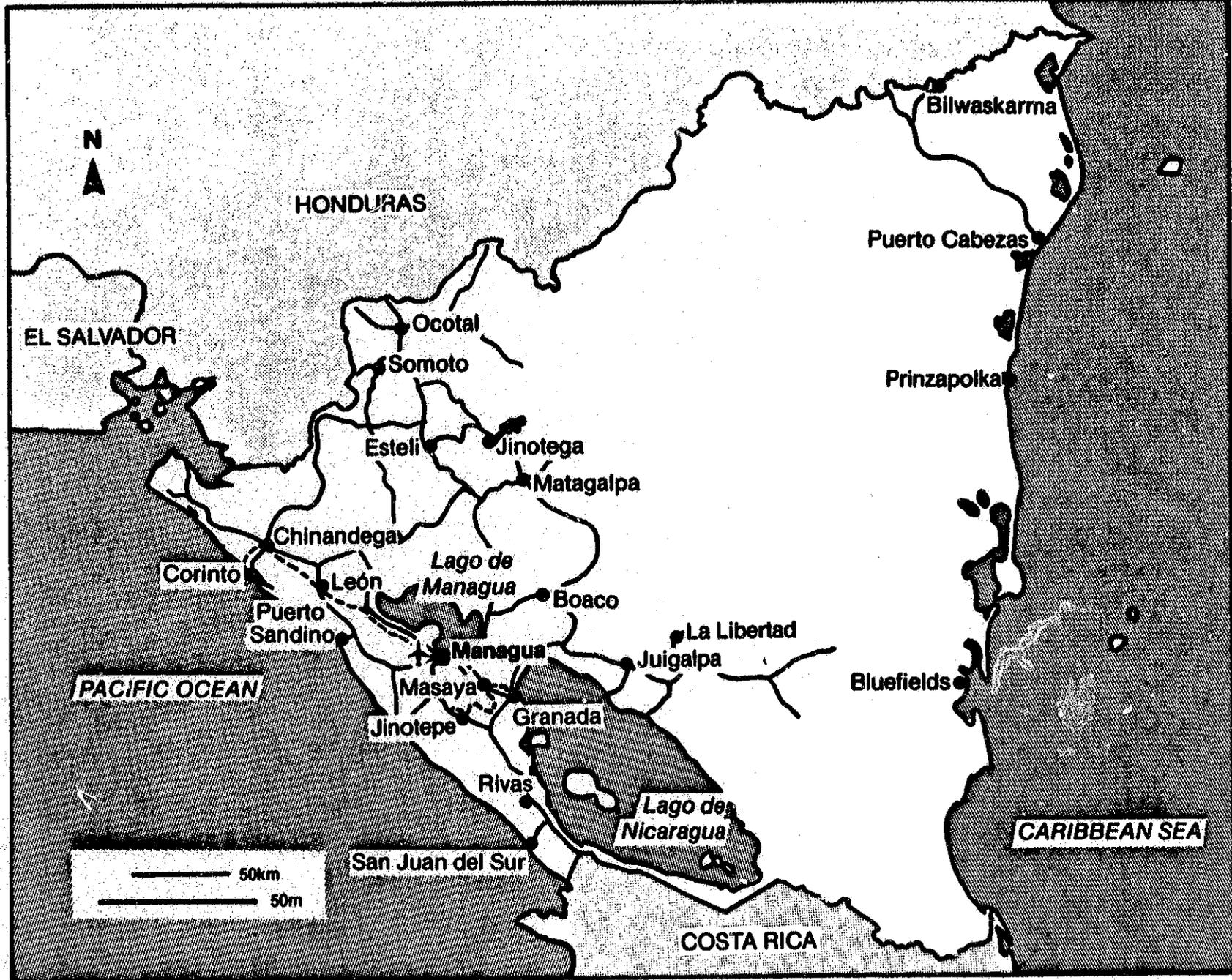


Figure E-5

NICARAGUA



APPENDIX F

NICARAGUA

COUNTRY BACKGROUND

With 130,000 square kilometers of territory and a population of 3.9 million, Nicaragua is one of the least densely populated countries in the region. It comprises three distinct geological zones: the coastal plain along the Pacific containing a volcanic chain and major lakes; the central and northern zones, a region of high plains, a mountain chain, and many hills and valleys; and the Atlantic zone, a low-lying densely wooded plain. Water resources are plentiful: Nicaragua has 24 major rivers, 78 secondary rivers, and numerous lakes.

COUNTRY PROFILE

Total Population:	3.92 million
	Urban: 2.32
	Rural: 1.60
Population Growth Rate:	Overall: 3.2%
Infant Mortality Rate:	56
Under 5 Mortality Rate:	85
Mortality Rate due to Infectious and Parasitic Diseases:	Not Available
Mortality Rate due to Intestinal and Diarrheal Diseases:	Not Available
Life Expectancy:	Male 64.8, Female 67.7
Adult Literacy:	83.3%
GNP per Capita (1987):	\$830
GNP per Capita Annual Growth from 1965-88:	-2.5%
Currency:	Gold Cordoba 5.0 = \$1
Average Annual Inflation from 1980-88:	86.6%

Nicaragua continues to face severe social and economic difficulties in spite of efforts to stabilize and rationalize the economy. PAHO reports that annual inflation was approximately 1700 percent in 1987 and rose to approximately 5000 percent in 1988. GDP and GNP growth have been negative from 1980 to 1988. The government has established social security and welfare programs to ease the impact of these economic difficulties on the low-income population.

Access to health care is poor, particularly in certain geographical areas and among some population groups. Water-related intestinal diseases are the leading causes of mortality. In 1987, one-third of the registered causes of mortality in children under one year were acute diarrheal and other infectious diseases.

Sanitary conditions in both urban and rural areas have deteriorated as a result of the revolution. Continued population growth has meant that pressure on existing water and sanitation facilities has increased. Like its neighbors, Nicaragua has significant pollution and waste disposal problems. In 1989, the country had only three water treatment plants, two of which were inefficient. Of the 19 municipal sanitary sewerage systems documented by PAHO in 1989, only nine had treatment units. PAHO estimates that only 56 percent of municipalities have garbage collection systems, resulting in a proliferation of solid waste.

The Instituto Nicaragüense de Acueductos y Alcantarillados (INAA) is responsible for the planning, design, and administration of sanitation and water supply systems. The Comité de Agua y Saneamiento coordinates water and sanitation policies.

COVERAGE LEVELS AND INVESTMENT

Current Projects

Although USAID has not been active in recent years, the country has received support in the sector from other governments and international donors. UNICEF, CIDA, and a number of PVOs, including CARE and Save the Children, are among these. Currently, the governments of Italy, Switzerland, and Norway fund programs in the sector. Because of Nicaragua's financial difficulties, the IDB and donor agencies of Germany and the United States have been inactive in recent years but plan to resume support in the sector. Both the KfW and USAID are in the process of planning for future programs in the sector.

- **CARE/CIDA**

The North Central Rural Integrated Water and Environmental Sanitation Program, which was to be inaugurated in January 1991, will improve and construct water systems and install handpumps and latrines in rural communities. The five-year project will be implemented by CARE/Canada, which has been working in Nicaragua's Region VI since 1983, in collaboration with INAA and the beneficiary communities. CARE staff will also provide health and sanitation education for the target population of 40,000 to ensure that the availability of safe water will contribute to improved health. CIDA's contribution of \$5 million primarily will provide equipment, materials, construction, and extension services. CARE/Canada will provide additional funding for the project. Funds planned for disbursement through 1995 (\$4 million) are considered in the analysis, though monies to cover education and the improvement of existing systems have been deducted.

CIDA also plans to finance a bilateral project to improve water systems in Leon, Chinandega, Masaya, Granada, Jinotega, and Rivas. The project will be implemented in collaboration with the national water utility agency and will upgrade and rehabilitate transmission and distribution systems and improve sanitary conditions for urban residents. In addition, it will seek to improve INAA's management and maintenance practices. The \$11 million project, scheduled for approval in December 1990, is planned to begin in February 1991 and run for five years. Because this project has not received final approval, funding has not been included in the analysis.

Total funding committed to increase coverage:

\$3,500,000

- **IDB**

After several years of inactivity, the IDB plans to reinstate programs in the coming year. Two projects in the sector, both to provide technical assistance, have been identified for funding. The first, a six- to nine-month institutional study to determine the proper structure of the sector, has been scheduled for 1991 and will cost \$150,000. Before any investments in large-scale capital projects, the IDB plans to conduct a prioritization study, also in 1991, that will cost an estimated \$1.2 million.

The IDB is also examining the possibility of financing rehabilitation and operational improvements in existing water and sanitation systems, an urgent need in Nicaragua. The project may involve the addition of disinfection units to ameliorate water quality and improved pumping equipment to recover lost capacity. Estimated funding for the project, if approved, is \$30 million over two years.

Total funding committed to increase coverage: \$0

- **Italy**

The Italian government plans to provide approximately \$2 million to support a water system project in Bluefields. No details are available at this time, so funding has not been included in the analysis.

Total funding committed to increase coverage: \$0

- **KfW**

The KfW is exploring the possibility of financing a water supply project, perhaps in coordination with USAID. At this point, however, there are no commitments or firm prospects for financing.

Total funding committed to increase coverage: \$0

- **Norway**

The Norwegian government supports an environmental project that emphasizes environmental sanitation in the urban areas of the North Atlantic Autonomous Region.

Total funding committed to increase coverage: \$0

- **Save the Children**

Between 1984 and 1989, Save the Children supported a project for constructing cement rings to reinforce more than 300 wells in the León region, expanding and improving water supplies for 2,700 residents in 20 rural communities. With community provision of labor and other resources, the rings were built at a cost of \$50 per well. Because the reinforcements were provided at no monetary cost to beneficiaries, the project stimulated the construction of new wells in the area. Save the Children has no firm commitments for future work in the sector.

Total funding committed to increase coverage: \$0

- **Switzerland**

In Region I, COSUDE (the Swiss International Development Assistance Agency) has financed small gravity-fed systems and dug wells since 1982. Latrine construction has been introduced in the current phase of regional development.

Now in its sixth phase, the project will provide approximately \$1 million over the next two years for developing new water and sanitation infrastructure, sanitation and hygiene education, and technical assistance to INAA. Although Phase VI has been underway since July 1990, funding has not been approved and signed by the Nicaraguan government because of administrative delays. COSUDE staff in Nicaragua anticipate that an agreement will be signed in 1991; consequently, this funding has been included in the analysis.

COSUDE has also provided co-financing for NGOs working in the water and sanitation sector at the level of \$100,000 to \$200,000 per year. Future NGO assistance has not been firmly committed and has not been incorporated in the investment analysis.

Total funding committed to increase coverage: \$1,000,000

- **UNICEF**

UNICEF has provided substantial support to the water sector over the past decade and, since 1987, has supported water and sanitation system development in Regions I, V, and VI, the most economically depressed areas of the country, through the Integrated Rural Development Program (FDQFI). Over the next five years, approximately 1,800 deep wells, 1,220 shallow wells fitted with handpumps, and 50 gravity-fed water systems will be constructed under this program. During the same period the program will install about 25,000 latrines. In the next planning period, UNICEF may also introduce the drilling of deep-bore wells fitted with handpumps. Beneficiary communities will be responsible for operating and maintaining these

facilities. In small municipalities for which water systems are constructed, cost sharing and user fee arrangements will be instituted to provide funding for maintenance and further expansion.

Under the education component of the FDQRI program, community-level water and sanitation committees will be established and trained to disseminate health and hygiene messages. UNICEF also plans to construct 200 wells and latrines for schools and health centers.

INAA will be responsible for overall project implementation in coordination with the Ministries of Health and Education. UNICEF's estimated investment from 1991 to 1995 is \$4,550,000. A portion of this has been omitted from the analysis to allow for funds allocated to the substantial educational component.

Total funding committed to increase coverage: \$4,000,000

- **USAID**

USAID has not yet initiated any specific sector projects but plans to focus its support on rural areas, concentrating on low-technology interventions like hand-dug wells, gravity-fed water systems, and pit latrines, as well as some drilled wells. USAID also plans to complement projects for service expansion with health education programs.

Total funding committed to increase coverage: \$0

Current Coverage

According to estimates available for 1990, overall water and sanitation coverage in Nicaragua is the lowest in the region. Although 71 percent of urban residents have water service, only 18 percent of rural residents have the same resources. Sanitation coverage in both rural and urban areas is deplorable, with 30 percent coverage in urban centers and 15 percent in rural locales. Coverage levels in all subsectors have changed very little over the past decade. The stagnation in water and sanitation development can be attributed largely to the civil strife that has plagued the country for many years. The conflict not only damaged existing resources but reduced the pool of external funding available to the sector. Coverage in 1990 and for selected preceding years is shown in Figures F-1 and F-2.

1995 WASH Targets

WASH targets for 1995 have been developed using the methodology outlined in Chapter 1. They are the incremental increases in coverage required by 1995 to meet the goal of full coverage by 2020. Since the targets are contingent on existing coverage levels, they are relatively low: 76 percent and 42 percent for urban water and sanitation, and 32 percent and 29 percent for rural water and sanitation, respectively. The targets are presented in the box below.

Subsector	1990 Coverage	Yearly Increase	5-Year Increase	1995 Coverage
Urban Water	71%	.97%	4.83%	75.83%
Rural Water	18%	2.73%	13.67%	31.67%
Urban Sanitation	30%	2.33%	11.67%	41.67%
Rural Sanitation	15%	2.83%	14.17%	29.17%

Meeting the 1995 Urban Water and Sanitation Targets

To meet WASH's urban services targets, Nicaragua must provide water service for an additional 413,000 urban dwellers and extend sanitation services to approximately 432,000 by 1995 (Tables F-1 and 2, Figures F-4 and 5). As illustrated in Table and Figure F-3, the total estimated investment required is \$128 million, with no firmly committed external assistance in either subsector. Current commitments are directed primarily to rural populations. One \$2 million water project in the city of Bluefields, to be funded by the Italian government, is planned for 1990 to 1995 and will likely be approved. With the approval of this project, Nicaragua still faces a deficit of \$126 million in commitments to urban water and sanitation development. Additional funding from CIDA and the IDB, still uncertain at this stage, may help offset this shortfall.

Meeting the 1995 Rural Water and Sanitation Targets

Although support is heavily skewed to the rural subsectors, it is unlikely that Nicaragua will be able to meet WASH's 1995 rural targets without substantial investments. The targets, shown in Tables F-1 and F-2 and Figures F-4 and F-5, envisage an increase of 307,000 persons with access to a water system and 304,000 with access to sanitary excreta disposal facilities. Based on the estimated unit costs for providing these services, \$25 million will be required for water and \$13 million for sanitation, with shortfalls of \$19 million and \$10 million, respectively.

Current levels of coverage are extremely low. Poor health conditions, which may be linked in part to poor hygiene, make additional investments over the next five years critical. Although future funding by CIDA and USAID may help reduce the \$157 million overall sector deficit, it is unlikely to offset the funding shortfall in its entirety. It is therefore urgent that other sources of assistance be found.

TABLE F-1

Actual Water Supply Coverage vs. Targets

WATER SUPPLY									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	2,746	1,094	40%	1,533	1,002	65%	1,213	92	8%
1985	3,959	1,660	42%	1,884	1,432	76%	2,075	228	11%
1988	3,622	1,928	53%	2,109	1,642	78%	1,513	286	19%
1990	3,917	1,931	49%	2,319	1,645	71%	1,598	286	18%
TARGETS FOR 1995	4,585	2,651	58%	2,715	2,058	76%	1,871	593	32%

Population figures are rounded to the nearest thousand.

1988 coverage data are from PAHO; 1985 figures are from IDWSSD directory; 1980 data are from UNICEF.

TABLE F-2

Actual Sanitation Coverage vs. Targets

SANITATION									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	2,746	942	34%	1,533	700	46%	1,213	242	20%
1985	3,959	901	23%	1,884	659	35%	2,075	242	12%
1988	3,622	927	26%	2,109	685	32%	1,513	242	16%
1990	3,917	942	24%	2,319	700	30%	1,598	242	15%
TARGETS FOR 1995	4,585	1,678	37%	2,715	1,132	42%	1,871	546	29%

Population figures are rounded to the nearest thousand.

1988 coverage data are from PAHO; 1985 figures are from IDWSSD directory; 1980 data are from UNICEF.

NICARAGUA URBAN AND RURAL WATER SUPPLY COVERAGE

PERCENTAGE OF POPULATION WITH ACCESS

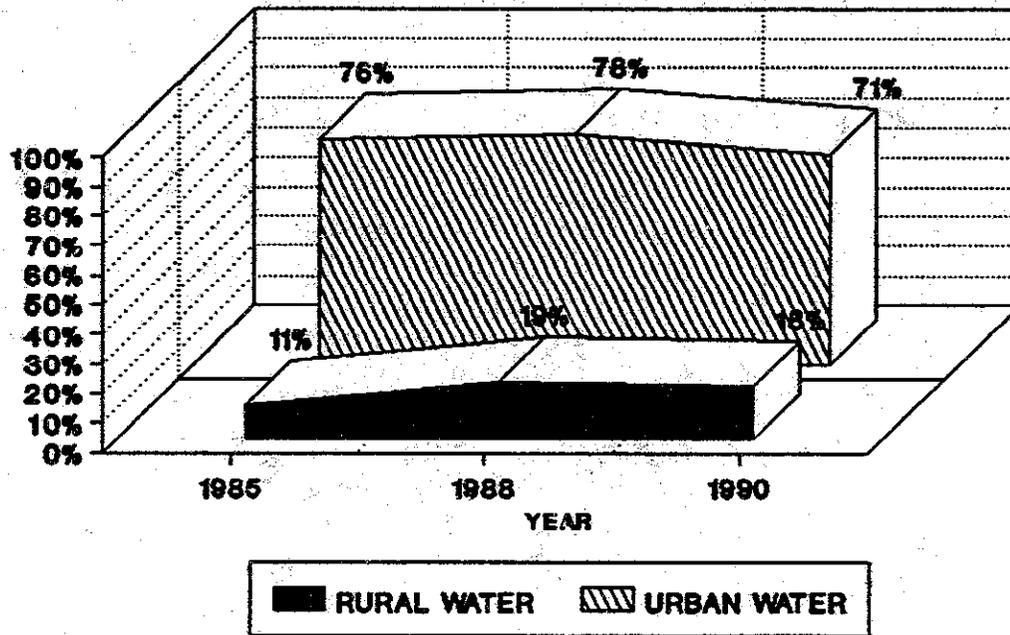


Figure F-1

NICARAGUA URBAN AND RURAL SANITATION COVERAGE

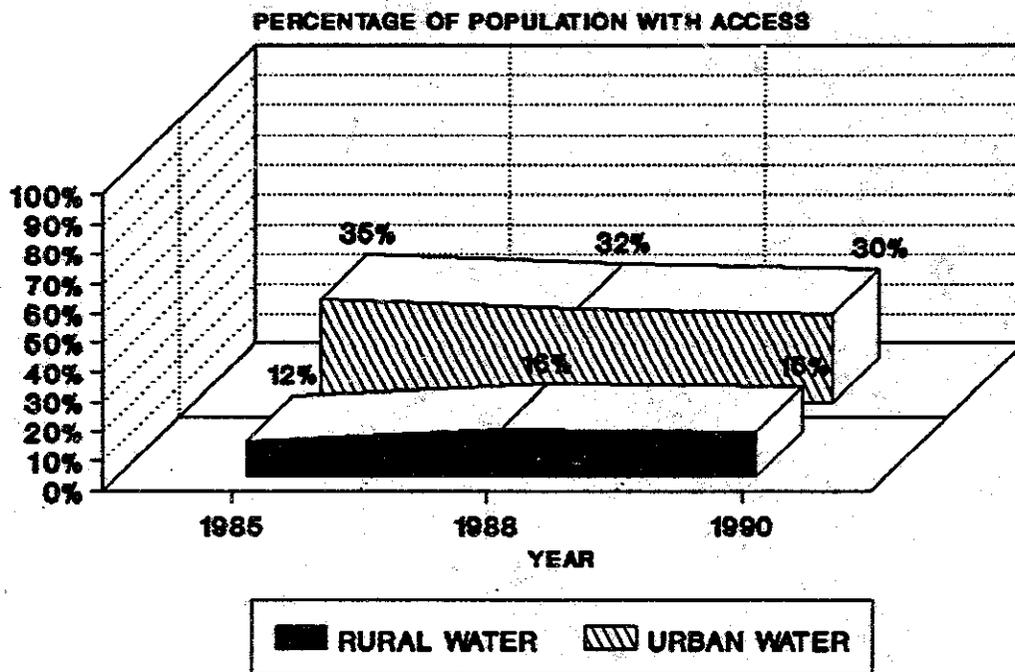


Figure F-2

TABLE F-3

Investment Needed to Meet 1995 Targets (1990 US\$000s)

	WATER SUPPLY COVERAGE PERSONS—000s			SANITATION COVERAGE PERSONS—000s			TOTAL FUNDING REQUIRED
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	
TARGET FOR 1995 (000s)	2,651	2,058	593	1,678	1,132	546	N/A
COVERAGE IN 1990	1,931	1,645	286	942	700	242	N/A
REQUIRED INCREASE	720	413	307	736	432	304	N/A
ESTIMATED UNIT COST (US \$ PER CAPITA)	N/A	\$98	80	N/A	203	42	N/A
ESTIMATED TOTAL COST TO MEET 1995 TARGETS (\$000s)	\$65,034	40,474	24,560	100,464	87,696	12,768	165,498
FIRMLY COMMITTED INVESTMENTS (\$000s)*	\$5,574	0	5,574	2,926	0	2,926	8,500
PROJECTED FUNDING SHORTFALL (\$000s)	\$59,460	40,474	18,986	97,538	87,696	9,842	156,998

* Includes only those investments to increase coverage.

NICARAGUA

INVESTMENT NEEDED TO MEET 1995 TARGETS

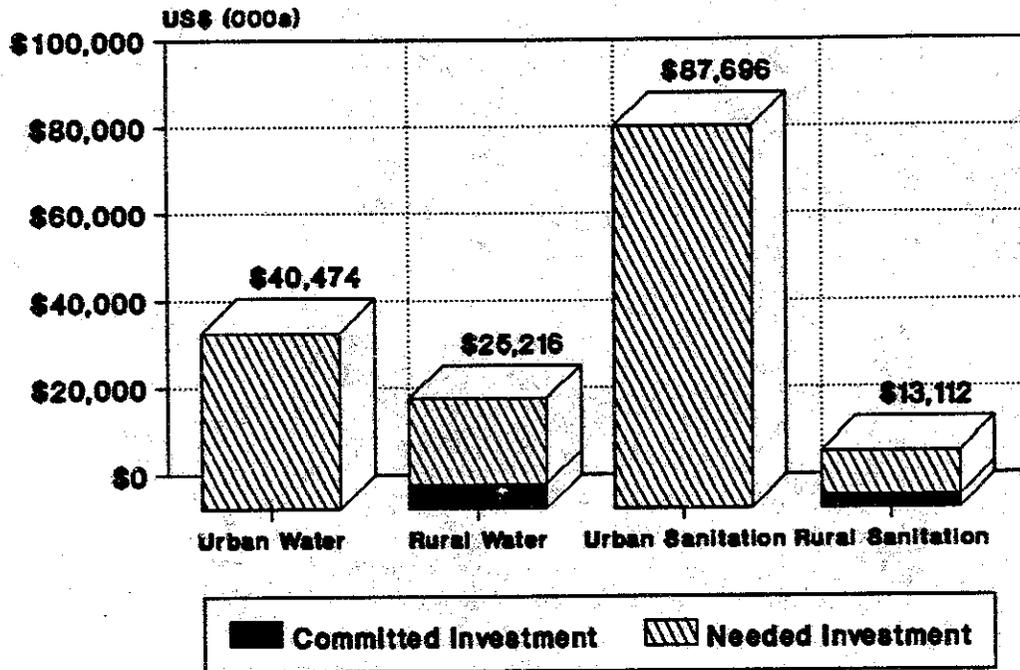


Figure F-3

NICARAGUA
1990 COVERAGE AND 1995 TARGETS
(% OF POP.)

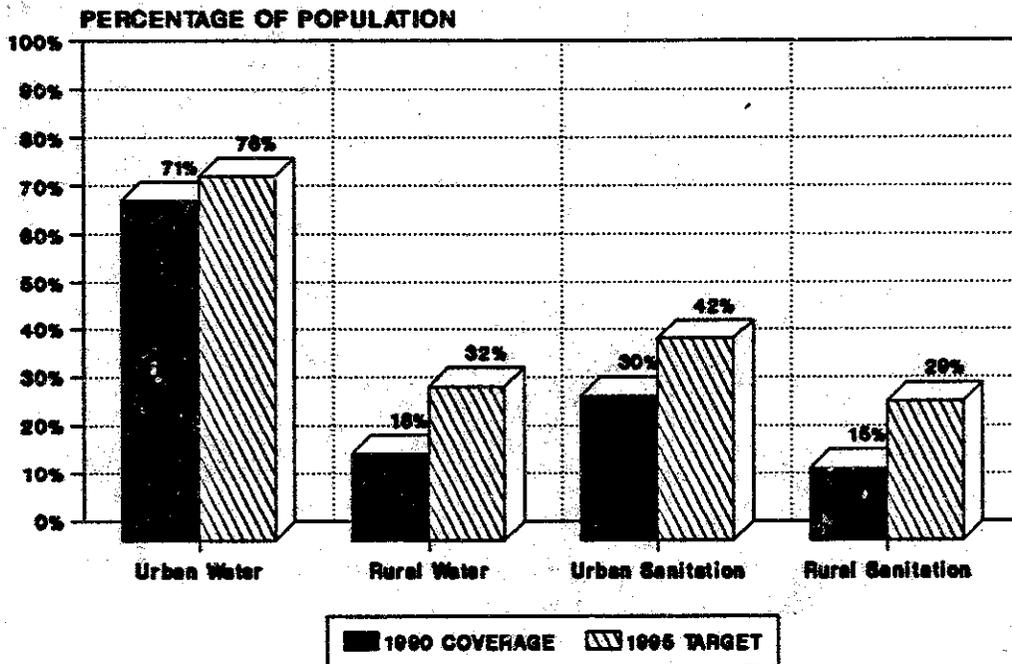


Figure F-4

**NICARAGUA
1990 COVERAGE AND 1995 TARGETS
(NO. OF PEOPLE)**

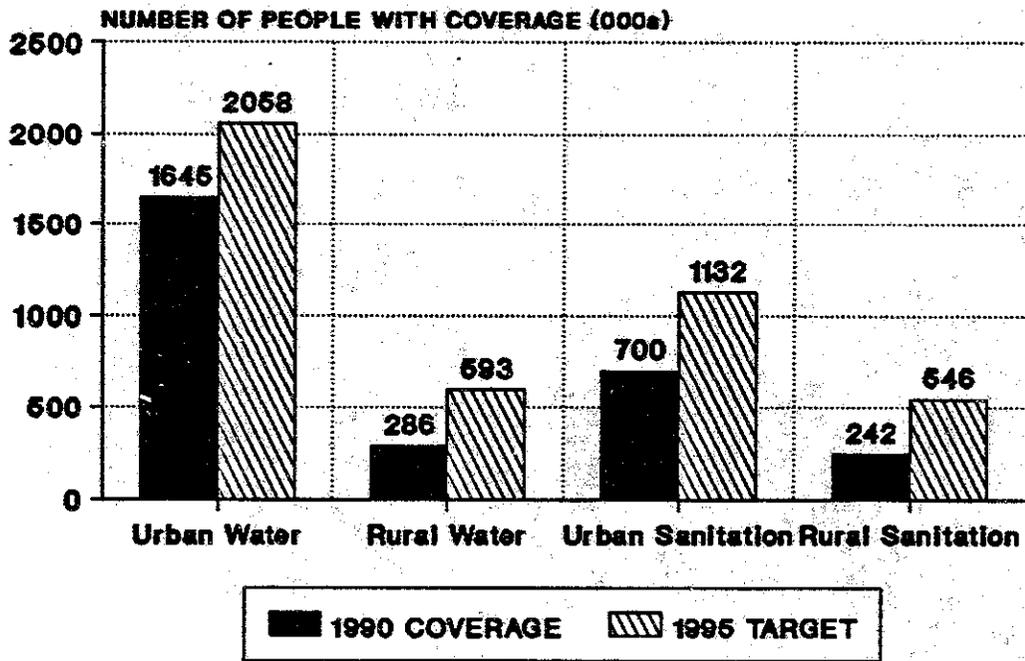
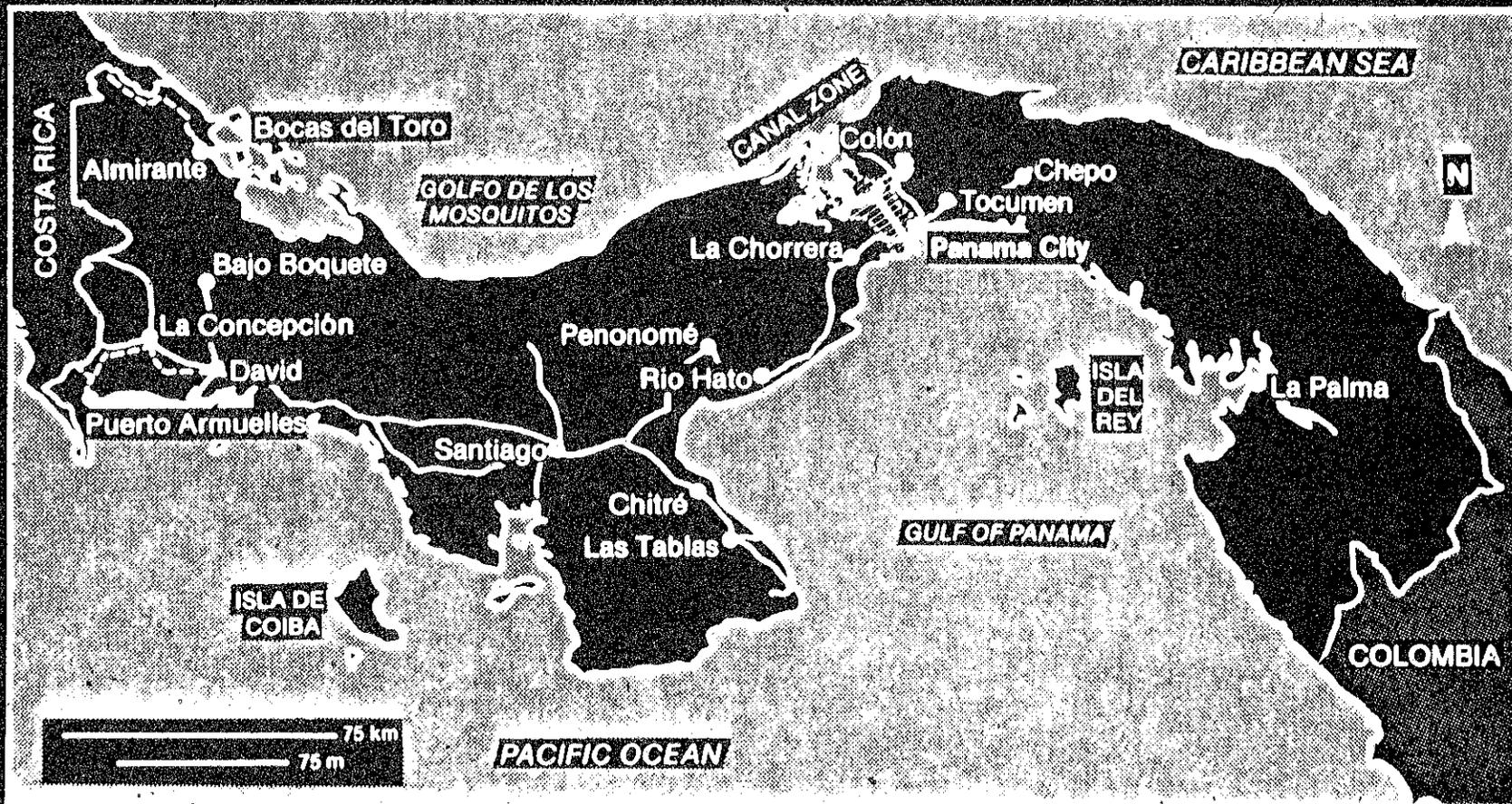


Figure F-5

PANAMA



COSTA RICA

CARIBBEAN SEA

GOLFO DE LOS MOSQUITOS

CANAL ZONE

Almirante

Bocas del Toro

Bajo Boquete

La Concepción

David

Puerto Armuelles

Santiago

Penonomé

Rio Hato

Chitré

Las Tablas

La Chorrera

Colón

Chepo

Tocumen

Panama City

ISLA DEL REY

La Palma

ISLA DE COIBA

GULF OF PANAMA

COLOMBIA



PACIFIC OCEAN

N

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APPENDIX G

PANAMA

COUNTRY BACKGROUND

The Republic of Panama, which covers 74,009 square kilometers, lies on the isthmus south of Central America. Over the past few years, it has suffered political and economic instability which climaxed in December 1989 with the ousting of the country's head of state. The new government has begun to implement a program of economic reform, but many economic and social problems persist. An estimated one-third of the population lives at the poverty level, and the already-problematic housing shortage for the poor was exacerbated by the 1989 conflict.

COUNTRY PROFILE

1990 Population:	2.32 million
	Urban: 1.21
	Rural: 1.11
	Overall: 2%
Population Growth Rate:	22
Infant Mortality Rate:	32
Under 5 Mortality Rate:	22.6
Mortality Rate due to Infectious and Parasitic Diseases:	9.0
Mortality Rate due to Diarrheal diseases:	72
Life Expectancy:	(70.2 Male, 74.1 Female)
Adult Literacy Rate:	85%
GNP per Capita (1989):	\$1,760
GNP per Capita (1988):	\$2,120
GNP per Capita Annual Growth from 1965-88:	2.2%
Currency:	Balboa 1 = \$1
Average Annual Inflation from 1980-88:	3.3%

Panama also faces a shortage of health care services. Over the past decade, however, there have been some improvements in the health status of the population, as indicated by downward trends in infant and overall mortality. The health system stresses immunization and has successfully achieved high coverage among infants. Compared with many other Central American nations, Panama has relatively high water and sanitation coverage, yet water-related diseases remain a challenge. Though not a leading cause of death among the general population, intestinal diseases rank second as a cause of death among newborns in rural areas, first among children aged 1 to 4, and second among children between 5 and 14 (PAHO).

As with its Central American neighbors, its inadequate water and sanitation systems mean that environmental health continues to pose a problem, particularly in rural areas and in the barrios surrounding principal urban centers. These urban settlements, a reflection of the housing shortage as well as an urbanization trend, have little or no access to sewerage systems and continue to rely on latrines for excreta disposal. The fecal contamination of Panama Bay, the result of inadequate treatment of waste, is a serious environmental problem. Other environmental problems include solid waste disposal in urban areas and the contamination of waterways by industrial waste and insecticides.

The Ministry of Health and the National Institute of Water Supply and Sanitation Systems (IDAAN) are responsible for promoting and implementing water and sanitation activities. The Ministry of Health serves communities of fewer than 500, while IDAAN serves communities of 500 or more. Master planning in the sector is coordinated by the Ministry of Health in collaboration with IDAAN and the Ministry of Planning and Political Economy.

COVERAGE LEVELS AND INVESTMENT

Current Projects

Because of political instability, as well as an economic crisis that halted the payment of obligations to international credit institutions, few external agencies currently are active in Panama. UNICEF is inaugurating a program in the water and sanitation sector, and USAID is providing limited sectoral assistance through economic support funds and is financing a small housing program. In addition, although disbursements from the IDB have been suspended, activity on IDB-financed projects has continued with previously disbursed and local counterpart funds.

- **IDB**

IDB programs were suspended in 1988 when Panama was unable to meet its obligations. Despite the end of disbursements, IDB-financed projects in the sector have remained active, though at a slower pace. Two IDB loans signed in April 1982 are financing the fourth stage of projects to improve and expand urban and rural water supply and sewerage systems. Total costs for both projects are estimated to be \$40 million, and IDB has provided loans of \$13 million for each. An additional \$14 million is being provided by IDAAN. The loan package has three components. The first covers the construction of 32 rural water supply systems, of which 27 have been completed and five are in the final phase of execution. The second covers the expansion and improvement of eight water systems for intermediate cities; four have been finished and four are in the final phase of execution. The third component, the extension and improvement of sanitation systems in the city of Las Tablas, has been completed. Through a separate allocation, the IDB is also financing the purchase and installation of 55,000 water meters. A fourth project, a pilot program of water optimization and rationalization in Tocumen, is pending implementation.

The World Bank and the IDB are in the process of structuring an economic recovery program, as part of which the efficiency of four of the largest public entities, one of which is IDAAN, will be improved. If the Public Enterprises Reform Loan is approved, both institutions will resume lending to Panama.

Total funding committed to increase coverage:

\$0

- **UNICEF**

UNICEF suspended its activities in response to the political upheavals of the late 1980s. The new program of support in the sector will focus on the poorest groups and will promote low-cost technologies. UNICEF plans to spend \$500,000 on its Panama water and sanitation program between 1991 and 1995.

Total funding committed to increase coverage: \$500,000

- **USAID**

USAID is providing some support for water and sanitation service expansion through a housing program for the approximately 2,200 displaced families of El Chorillo who lost their homes during the events of December 1989. All the new homes, which are being built in Panama City and the surrounding semi-urban areas, have water and sanitation service. USAID anticipates that this program, which will cost approximately \$20 million, will end in the first quarter of 1991.

Although USAID has no direct investments in the sector, the government plans to use part of a \$420 million donation for the rehabilitation and reconstruction of some water and sewerage systems in the cities of Panama and Colon. The actual amount to be allocated is uncertain.

Total funding committed to increase coverage: \$0

Current Coverage

Compared with that in many other countries in the region, water and sanitation service coverage is relatively high. At the end of 1990, 91 percent of urban residents had access to water and sanitation services, and 74 percent of rural residents had access to water and 77 percent to sanitation facilities. These levels of coverage are shown graphically in Figures G-4 and G-5.

1995 WASH Targets

The 1995 targets for water and sanitation coverage have been developed using the methodology outlined in Chapter 1. Since current levels of coverage are high, relatively small increases are required to meet the targets. WASH goals for the urban subsectors are 93 percent for water (a 2 percent increase) and 92 percent for sanitation (a 1 percent

increase). The targets for the rural subsectors are 78 percent for water and 81 percent for sanitation, which represent increases of 4 percent in each subsector. These targets are illustrated in Tables and Figures G-1 and G-2 and are presented below.

Subsector	1990 Coverage	Yearly Increase	5-Year Increase	1995 Coverage
Urban Water	91.44%	.29%	1.43%	92.87%
Rural Water	73.65%	.88%	4.39%	78.04%
Urban Sanitation	90.53%	.32%	1.58%	92.11%
Rural Sanitation	76.81%	.77%	3.86%	80.67%

Meeting the 1995 Urban Water and Sanitation Targets

Because of the current high levels of coverage, relatively small percentage increases are required to meet the 1995 targets shown above. Tables G-1 and G-2 (and Figures G-4 and G-5) indicate that by 1995 water services should be available to an additional 209,000 and sanitation services to an additional 208,000 urban residents.

The investment to meet the urban goals totals nearly \$96 million—more than \$33 million for water and more than \$62 million to provide sanitation facilities (Table and Figure G-3). With only an estimated \$250,000 in external support allocated to urban water and sanitation expansion over the next five years, it will be difficult to meet the targets. WASH estimates that an additional \$96 million must be committed to expanding these services. If Panama is able to re-establish access to credit with the IDB and the World Bank, however, funds should become available to reduce the shortfall.

Meeting the 1995 Rural Water and Sanitation Targets

In rural Panama, access to water and excreta disposal systems is also relatively high in comparison with other Central American nations. The 1995 targets, 78 percent and 81 percent for water and sanitation respectively, require increases of only 4 percent each in coverage. WASH estimates that increasing access to the target levels (providing facilities to an additional 196,000 persons in each subsector) will cost \$20 million for water and \$4 million for sanitation. Funding requirements for each subsector are shown in Table and Figure G-3. Given current commitments of approximately \$250,000, the rural sector will require approximately \$23 million in additional funding to meet the goals. As observed previously, prospective funding from the World Bank and IDB may help to reduce this deficit.

TABLE G-1

Actual Water Supply Coverage vs. Targets

WATER SUPPLY									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	1,977	1,527	77%	1,003	913	91%	974	614	63%
BASELINE 1984	2,157	1,643	76%	1,127	1,116	99%	1,030	527	51%
1985	2,249	1,831	81%	1,195	1,183	99%	1,054	648	61%
1988	2,305	1,981	86%	1,230	1,220	99%	1,075	761	71%
1989	2,393	1,890	79%	1,305	1,095	84%	1,088	795	73%
1990	2,315	1,920	83%	1,208	1,105	91%	1,107	815	74%
TARGETS FOR 1995	2,710	2,324	86%	1,414	1,314	93%	1,296	1,011	78%

Population figures are rounded to the nearest thousand.

TABLE G-2

Actual Sanitation Coverage vs. Targets

SANITATION									
YEAR	TOTAL POP.	ALL AREAS		URBAN AREAS			RURAL AREAS		
		POP. SERVED	% OF POP. SERVED	TOTAL URBAN POP.	POP. SERVED	% OF POP. SERVED	TOTAL RURAL POP.	POP. SERVED	% OF POP. SERVED
1980	1,977	1,225	62%	1,003	650	65%	974	575	59%
BASELINE 1984	2,157	1,367	63%	1,127	687	61%	1,030	680	66%
1985	2,249	1,424	63%	1,195	729	61%	1,054	695	66%
1988	2,305	1,856	81%	1,230	1,071	87%	1,075	785	73%
1989	2,393	1,924	80%	1,305	1,094	84%	1,088	830	76%
1990	2,315	1,944	84%	1,208	1,094	91%	1,107	850	77%
TARGETS FOR 1995	2,710	2,348	87%	1,414	1,302	92%	1,296	1,046	81%

Population figures are rounded to the nearest thousand.

PANAMA URBAN AND RURAL WATER SUPPLY COVERAGE

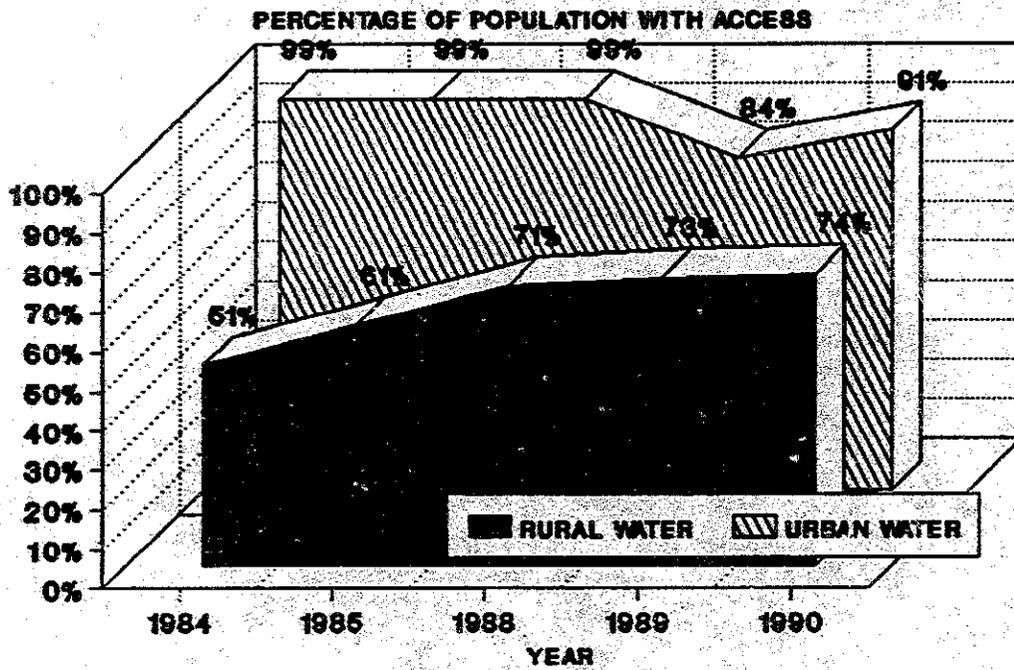


Figure G-1

PANAMA URBAN AND RURAL SANITATION COVERAGE

PERCENTAGE OF POPULATION WITH ACCESS

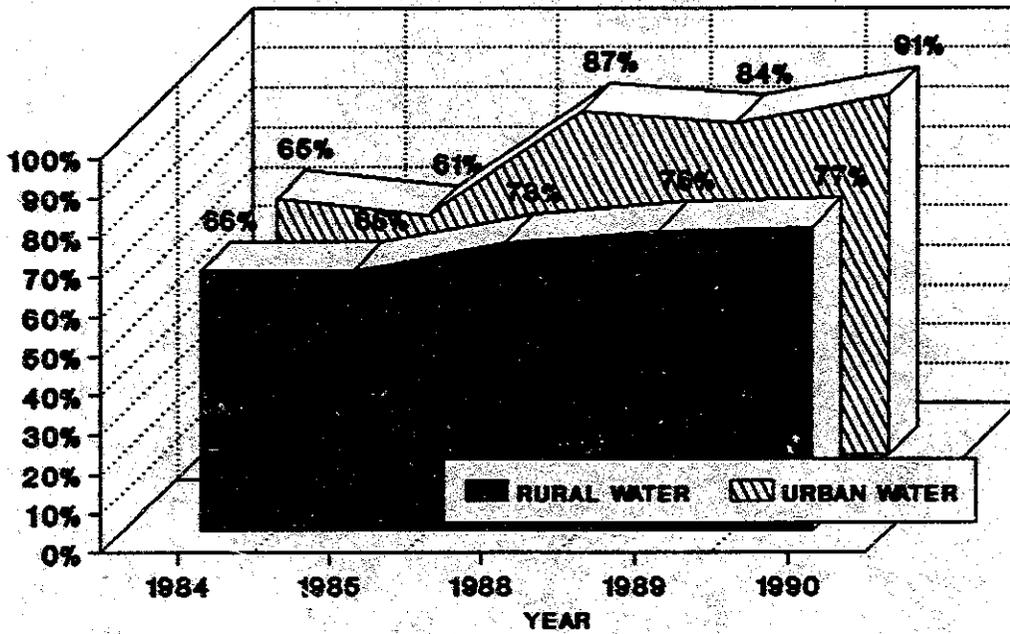


Figure G-2

TABLE G-3

Investment Needed to Meet 1995 Targets (1990 US \$000s)

	WATER SUPPLY COVERAGE (PERSONS—000s)			SANITATION COVERAGE (PERSONS—000s)			TOTAL FUNDING REQUIRED
	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	
TARGET FOR 1995 (000s)	2,325	1,314	1,011	2,348	1,302	1,046	N/A
COVERAGE IN 1990	1,920	1,105	815	1,944	1,094	850	N/A
REQUIRED INCREASE	405	209	196	404	208	196	N/A
ESTIMATED UNIT COST (US \$ PER CAPITA)	N/A	\$160	102	N/A	300	19	N/A
ESTIMATED TOTAL COST TO MEET 1995 TARGETS (\$000s)	\$53,432	33,440	19,992	66,124	62,400	3,724	119,556
FIRMLY COMMITTED INVESTMENTS (\$000s)*	\$298	87	211	202	163	39	500
PROJECTED FUNDING SHORTFALL (\$000s)	\$53,134	33,353	19,781	65,922	62,237	3,685	119,056

* Includes only those investments to increase coverage.

PANAMA

INVESTMENT NEEDED TO MEET 1995 TARGETS

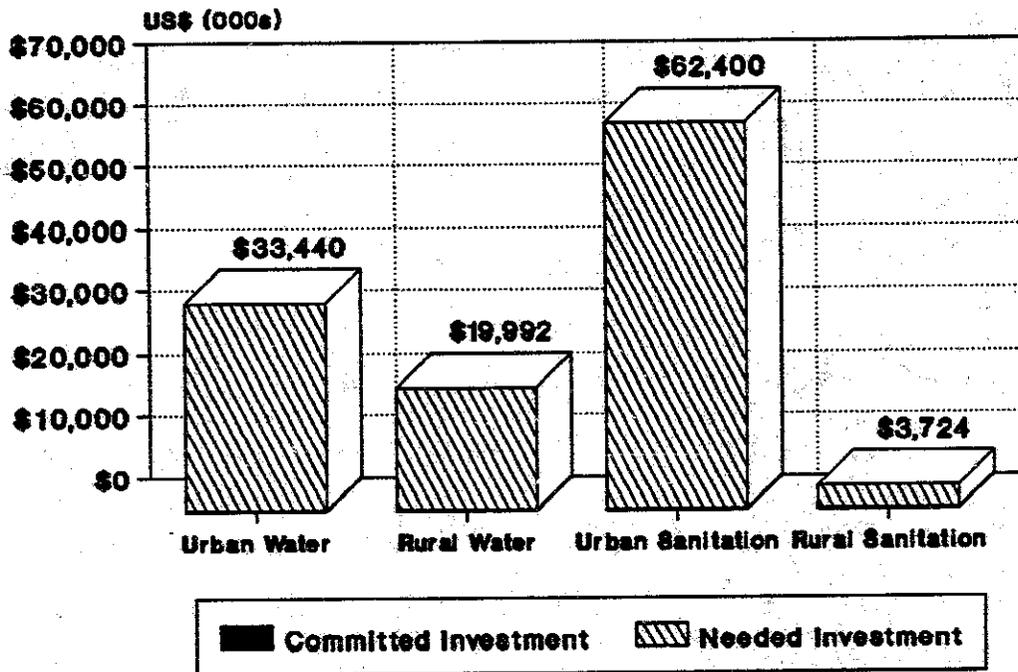


Figure G-3

PANAMA
1990 COVERAGE AND 1995 TARGETS
(% OF POP.)

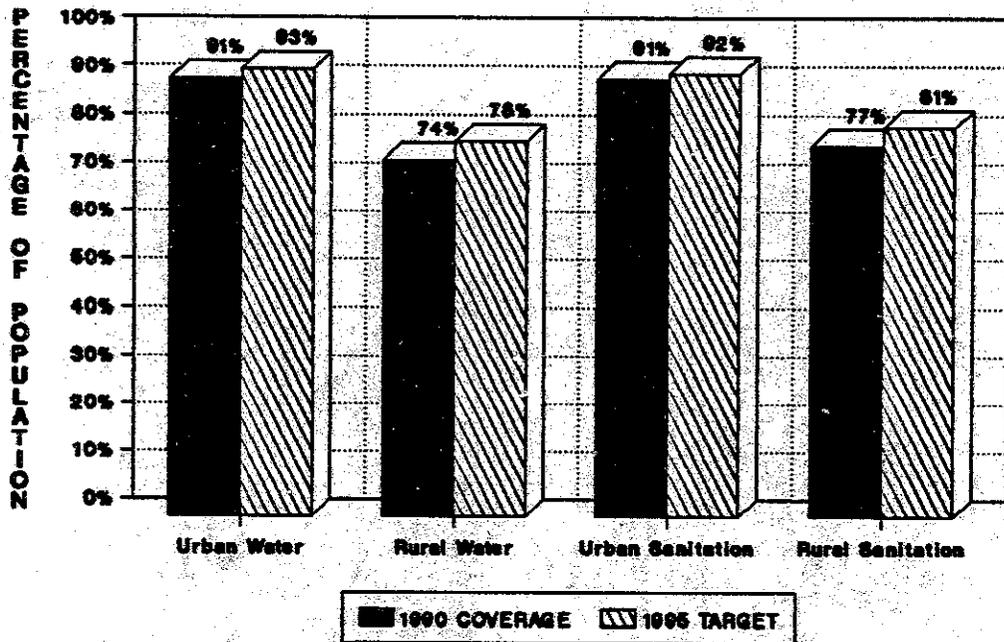


Figure G-4

PANAMA
1990 COVERAGE AND 1995 TARGETS
(NO. OF PEOPLE)

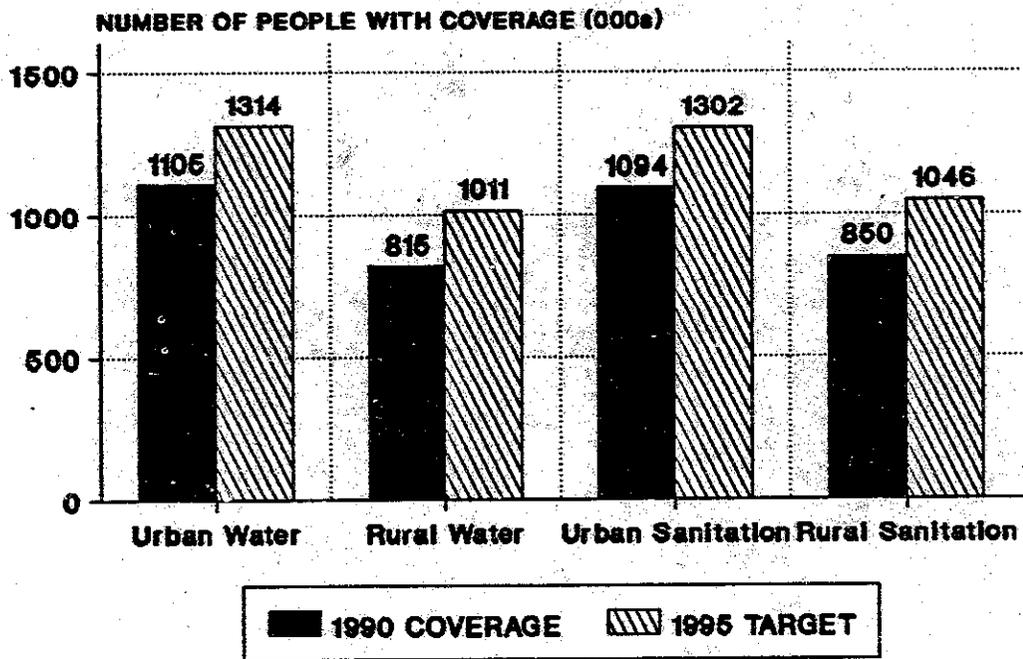


Figure G-5