

# URBAN WATER SUPPLY AND SEWERAGE PROJECT

(PR-0064)

## EXECUTIVE SUMMARY

**BORROWER AND GUARANTOR:** Republic of Paraguay

**EXECUTING AGENCY:** Corporación de Obras Sanitarias [Sanitation Works Authority] (CORPOSANA)

**AMOUNT AND SOURCE:**

IDB (OC):	US\$ 49,600,000
IDB (OC-IFF):	US\$ 30,000,000
OECEC cofinancing:	US\$ 52,220,000
MIF cofinancing:	US\$ 980,000
Local counterpart funding:	<u>US\$ 7,200,000</u>
Total:	US\$140,000,000

**FINANCIAL TERMS AND CONDITIONS:**

Amortization period:	25 years
Disbursement period:	5 years
Grace period:	5 years
Interest rate:	variable
Inspection and supervision:	1%
Credit fee:	0.75%

**OBJECTIVES:** The objectives of the proposed program are to:

- (a) support the establishment of a new legal and institutional framework for the sanitation sector;
- (b) improve the technical, financial, administrative, and business efficiency of CORPOSANA; and (c) improve the living conditions of the people living in the metropolitan area of Asunción and other Paraguayan cities, by increasing water supply and sewerage system coverage.

**DESCRIPTION:** To accomplish these objectives, the program has been designed to comprise the following components:

- (a) Consulting services will be provided for:
  - (i) development of a legal and institutional framework for Paraguay's water and sanitation sector;
  - (ii) feasibility studies and final designs for additional projects under the component for works in cities in the interior; and (iii) management of the program, including: preparation and analysis of bidding, supervision of consultants and works, supervision of design preparation and review of project feasibility studies, procurement of materials and equipment, drafting of progress reports, and

preparation of documents rendering accounts to the Bank.

(b) Consulting services will be provided for the institutional strengthening of CORPOSANA and will include: (i) review of CORPOSANA's business, accounting, and financial systems in order to identify existing problems clearly and make recommendations; (ii) development of an information systems plan for CORPOSANA to guide equipment and program procurement; (iii) implementation of the recommendations arising from the systems review; (iv) internal audit support to make the process more efficient; (v) training for CORPOSANA staff to better meet the utility's needs; (vi) preparation of a management information system to support CORPOSANA in its decision-making process; (vii) decentralization of the operation and maintenance of CORPOSANA's systems; and (viii) reduction of unmetered water, including the design of a plan to divide Asunción's water distribution system into sectors, and updates of system surveys and consumer master files.

(c) Specific works in the metropolitan area of Asunción will include: (i) increased raw-water pumping capacity; (ii) pipelines for the main system; (iii) regulating tanks and equipment for distribution centers; (iv) secondary distribution system and household connections; and (v) establishment of pitometric districts.

(d) Multiple works in cities in the interior will include expansion or installation of water supply systems and expansion or installation of sewage collection, treatment, and final disposal systems.

**ENVIRONMENTAL  
CLASSIFICATION:**

The Environment Committee, at its meeting of March 8, 1994, classified this as a Category III operation. The Committee approved the program's environmental summary at its meeting of October 18, 1994.

**BENEFITS:**

(a) For the sector: adoption of a legal and institutional framework and establishment of an autonomous regulatory agency, which will encourage the flow of private capital into the sector.

(b) For CORPOSANA: (i) reduction of unmetered water from 40 percent to 28 percent; (ii) ability to raise the funds needed to finance the expansion of its water supply and sewerage systems; (iii) more efficient collections in order for accounts receivable for services at December 31, 2000, to represent the equivalent of 40 days of billing; and (iv) reduction

in the ratio of employees to connections from 7.1 per 1,000 to 5 per 1,000.

(c) For the metropolitan area of Asunción: (i) installation of 36,700 metered household connections, to benefit some 147,000 people, thereby increasing water supply coverage from 73 percent to 83 percent; and (ii) efficient operation of the water distribution system.

(d) For cities in the interior: expansion or installation of water supply systems and/or expansion or installation of sewage collection, treatment, and final disposal systems in 10 cities, which will benefit some 125,000 people.

**LOW-INCOME GROUP  
TARGETING:**

Under the program, 42.3 percent of the beneficiaries will be from low-income groups, a percentage that is higher than the national rate of 32.3 percent. The program thus meets the second criterion set forth in document AB-1704 on the Eighth General Increase in Resources that there be a higher proportion of low-income beneficiaries than the percentage of low-income individuals in the country. In Paraguay, low-income groups are composed of individuals whose monthly family income is under US\$281 as of June 1994.

**RISKS:**

The following factors may adversely affect the operation:

(a) CORPOSANA's financial situation may deteriorate if the utility's operations are not made as effective as possible and/or if the rates implemented are not economically and financially sound. This risk is minimized since the program includes support for the institutional strengthening of CORPOSANA and strict monitoring of the utility's financial situation.

(b) Fewer connections to the new sewerage and water supply systems may be installed than originally estimated, in which case the anticipated benefits of the projects will not be achieved and CORPOSANA will be hurt financially. This risk is minimized with the elimination of the charge for connections, identified in the analysis as the main obstacle to installing them.

(c) Delays in the implementation of the sector's regulatory framework may occur. The main consequence of not implementing the regulatory framework proposed under the program would be the lack of an independent agency to supervise activities in the sector and of

clear rules for allowing private capital to be invested in the sector. The Executive Branch has demonstrated its commitment to implementing this framework and, pursuant to the contractual conditions for the operation, disbursement of 50 percent of the program resources will depend on the progress made in that area.

**THE BANK'S  
COUNTRY AND  
SECTOR STRATEGY:**

The Bank's strategy for Paraguay, which is consistent with the government's policy, gives precedence to supporting low-income groups and protecting the environment. Among its priorities, the strategy for the sanitation sector includes the need to support the country in: (a) defining, developing, and implementing a new legal and institutional framework; and (b) eliminating the serious deficiencies in service coverage by building, expanding, and reconditioning the water supply and sewerage systems.

**SPECIAL  
CONTRACTUAL  
CONDITIONS:**

(a) Prior to the first disbursement of the financing, the following special contractual conditions must be fulfilled: (i) the complementary agreement with the executing agency must be signed, under which the borrower will transfer the resources of the financing (paragraph 4.1); (ii) evidence that the borrower and the executing agency have agreed to: (1) the clearance and payment of updated amounts outstanding owed by the borrower to the executing agency; and (2) the refinancing of the updated balance of the debt previously incurred by the executing agency with the Ministry of Finance and the Central Bank of Paraguay (paragraph 4.28); (iii) the program's management firm has been hired and the program coordination group has been appointed (paragraph 3.3); (iv) the consulting firm in charge of supporting execution of the component for development of the water and sanitation regulatory framework has been hired (paragraph 3.12); (v) evidence that: (1) the methodology for calculating rates based on long-term marginal costs has been adopted; (2) a new rate structure has been established for residential and nonresidential categories only, with a rate for basic residential consumption of up to 15 cubic meters and a single rate for other patterns of use; (3) restrictions on rate-setting for sewerage services have been eliminated; and (4) fees for connection to the water supply and sewerage systems have been eliminated (paragraph 4.19); and (vi) evidence that the OECF has formalized its commitment to provide financing (paragraph 2.16).

(b) The following other special contractual conditions must be fulfilled: (i) the necessary environmental protection measures must be included in the bidding documents (paragraph 3.35); (ii) the consulting services provided for in the program must be hired (paragraphs 3.15, 3.17, 3.18, 3.21, 3.23, and 3.24); (iii) a plan and schedule must be submitted for implementation of the recommendations made by the consultants provided for under the program (paragraph 3.13); (iv) a mid-term evaluation of program execution must be conducted 30 months after the effective date of the contract or prior to commitment of 50 percent of the financing, whichever comes first, to verify, *inter alia*, implementation of the regulatory framework for the water supply and basic sanitation sector and other proposed studies and plans. The Bank may suspend disbursements of uncommitted resources should lack of substantial progress be noted in the implementation of the regulatory framework or in the improvement of CORPOSANA's productivity indexes (paragraph 3.40); (v) a fund must be set up to provide financing for individual sanitation systems and in-house connections and the required operating regulations for the operation of the fund must be submitted (paragraph 3.28); (vi) the executing agency's updated annual financial plans must be submitted, with a 10-year outlook (paragraph 5.16); (vii) prior to the construction of any pipelines in the secondary systems, either for water distribution or sewage collection, CORPOSANA must submit evidence that at least 65 percent of the potential beneficiaries have expressed interest in being connected to the systems (paragraph 3.7); (viii) CORPOSANA will gather and process data for a possible ex post evaluation of the program (paragraph 3.43); (ix) CORPOSANA must present a payment plan and schedule for local governments to pay their delinquent accounts (paragraph 4.25); (x) CORPOSANA must collect at least 85 percent of its accounts receivable (paragraph 4.25); (xi) water and sewerage rates must produce sufficient income to cover all operating costs. Applying such rates should generate enough resources for the utility to service its debt and finance 25 percent of its investment program. This percentage will not apply to investment programs partially financed by the Bank and the IBRD (paragraphs 5.14 and 5.15); and (xii) the period for physical initiation of the works and the term for disbursement of loan resources will be four and five years respectively, from the effective date of the contract.

Moreover, the other conditions typical of the nature of this operation will be included.

## I. FRAME OF REFERENCE

### A. Recent economic picture

- 1.1 In the 1980s, several significant aspects of the Paraguayan economy underwent a transformation. After achieving one of the highest growth rates of the region in the 1960s and 1970s, as a result of the rapid expansion of the agricultural frontier and the construction of the Itaipú dam, the country's economic situation weakened considerably. Annual growth of production fell to 2.5 percent in the period from 1980 to 1989 and this factor, combined with rapid population growth of almost three percent per year, resulted in a slightly declining per capita income. At the same time, inflation grew at a rate of 20.1 percent per year.
- 1.2 In view of growing structural restraints on growth, in 1989 the central government decided to implement policy changes that redefined the function of the State and brought about far-reaching reforms in exchange regulations, financial markets, the tax system, and trade policy. Another significant change was the new Constitution, which was approved in mid-1992.
- 1.3 The 1992 Constitution delegated functions to the country's municipalities, including responsibility for planning and regulation of urban development, environmental protection, construction of urban infrastructure works, and the delivery of urban services in a wide range of sectors, including sanitation.

### B. The water supply and sanitation sector in Paraguay

#### 1. Regulatory (legal and institutional) framework of the sector

- 1.4 For the sanitation sector to operate properly, laws are required that clearly identify the agencies participating in the sector and their respective roles, and regulations setting rates that will ensure full cost recovery and make it possible to expand the systems. It is necessary that: (a) the policy-setting functions be placed in a single ministry; (b) an independent agency, with financial and administrative autonomy, be set up as the sector's regulatory and supervisory authority; and (c) the delivery of services be the responsibility of public, semipublic, or private companies created specifically for that purpose. In addition, the sector's legislation must indicate clearly whether the authority to license water and sewerage services will remain with the local governments or with the national government.
- 1.5 The institutional and legal framework for water supply and sewerage services in Paraguay presents problems that warrant immediate attention. There is currently no legislation precisely defining the operating rules for the sector, the agencies that would be involved in it, and their specific responsibilities, nor is there a

modern, efficient, and consumer-friendly rate policy. The setting of rates does not take into account the need for the utility to recover all investment, operating, and maintenance costs, service its debt, and be in a position to expand its water and sewerage services. Nor has an attempt been made to use the pricing of services, i.e., rates, as a tool to achieve rational use of water, in order to postpone investments in system expansion. The main reason for the low level of water and sewerage service coverage in Paraguay is the lack of an appropriate rate policy, which has made it difficult to obtain the resources necessary to expand the systems.

- 1.6 Responsibility for water supply and sewerage services in Paraguay is shared by the Ministry of the Interior, the Ministry of Health, and the Defense Ministry, working through the Corporación de Obras Sanitarias [Sanitation Works Authority] (CORPOSANA), the Servicio Nacional de Saneamiento Ambiental [National Environmental Sanitation Authority] (SENASA), and the Water Supply Department for the Chaco region, respectively. CORPOSANA is responsible for urban areas, <sup>1/</sup> SENASA for rural areas, and the Water Supply Department for the Chaco region for both urban and rural localities in that part of the country. There are also private companies that provide water services independently, particularly in Asunción. Because of the lack of control by competent agencies, these services often do not meet acceptable quality standards.
- 1.7 In addition to delivering services, CORPOSANA is also responsible for regulating and supervising all the other water supply and sanitary sewerage systems and for recommending to the Executive Branch the licensing of such sanitation services to other public or private entities. The assignment to CORPOSANA of all three roles - delivering, regulating, and supervising the services - is inappropriate.
- 1.8 As indicated in chapter IV of this document, CORPOSANA is implementing a new organizational structure, developed with the support of the Bank through loan 818/SF-PR. Some systems still need to be developed and implemented, however, primarily in the business, accounting, and financial planning areas, actions that were not provided for under loan 818/SF-PR. An information systems plan is required to complement these activities, for the purpose of guiding the procurement, development, and documentation of equipment and programs. Moreover, CORPOSANA's operations are inefficient, with an oversized and underqualified staff.

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<sup>1/</sup> A locality is considered an urban area if it has over 4,000 inhabitants.

## 2. Rate policy

- 1.9 The lack of an appropriate rate policy for water and sewerage services has deeply affected CORPOSANA. From September 1990 to January 1994, a period during which inflation reached 60 percent, CORPOSANA was unable to adjust its rates, even to match inflation. Until recently, its sewerage rates were limited to 10 percent of the charge for water, and although this figure has been increased to 50 percent, it bears no relation to the real costs of the service. During the period from 1990 to 1992, the utility was able to defray its operating costs but its ability to invest in the expansion of its systems was weakened significantly. In 1993, the utility was unable to meet all of its operating costs.

## 3. Population and service coverage

- 1.10 According to the 1992 census, Paraguay has a population of 4.1 million inhabitants. Its political and administrative structure divides the country into 18 departments and the city of Asunción, the capital. While its population density is one of the lowest in the region, the population grew rapidly during the period from 1982 to 1992, at an annual rate of 3.1 percent. The population is not evenly distributed geographically. The eastern region, bound by the Paraguay River, covers 40 percent of the territory and is home to 97 percent of the population. Of the total population, 49.5 percent lives in rural areas, compared with 66 percent as identified under the previous census, which seems to indicate growing migration towards the cities. The metropolitan area of Asunción, which consists of the capital and six neighboring municipalities, has slightly over one million inhabitants, and approximately half the urban population of the country.
- 1.11 Water supply and sanitation services in Paraguay are highly deficient, with one of the lowest levels of coverage in the region. Figures for 1993 indicate that 29 percent of the population has access to the public water supply system and only 11 percent has sanitary sewerage service. Of the urban population, 53 percent has water service from the system and 22 percent has public sewerage service. Only three percent of the urban population that has sewerage service lives outside the metropolitan area of Asunción. In the areas lacking sewerage, low-cost individual systems such as septic tanks, seepage pits, and pit latrines are used by an estimated 60 percent of the rural population, and half of these systems do not meet minimum standards for this type of facility. The table below summarizes the current status of these services:



WATER SUPPLY AND SANITATION SERVICE COVERAGE (Population in thousands)										
	With running water		Without running water		With sewerage service		With indiv. systems or no sanitation		Total	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
1. Urban	1,150	53	920	47	460	22	1,610	78	2,070	50.5
Metrop. Asunción	640	63	370	37	404	40	606	60	1,010	24.5
Cities in the interior	510	48	550	52	32	3	1,028	97	1,060	26.0
2. Rural	324	16	1,705	84	--	--	2,029	100	2,029	49.5
Concentrated <sup>2/</sup>	234	65	126	35	--	--	360	100	360	8.6
Scattered	90	5	1,630	95	--	--	1,720	100	1,720	40.9
TOTAL	1,190	29	2,910	71	450	11	3,650	89	4,100	100.0

#### 4. Status of the services in the metropolitan area of Asunción

##### a. Water supply

- 1.12 The Paraguay River is the source of Asunción's water supply system. In 1968, the Bank financed the construction of a treatment plant. In 1988, again with a loan from the Bank, the first stage of the plant's expansion was carried out. The rate of coverage of the water supply system in the metropolitan area of Asunción will reach 73 percent by mid-1995, when the installation of household connections provided under loan 818/SF-PR, currently under way, is completed. It is estimated that seven percent of the services are provided by private vendors. In the metropolitan area of Asunción some 270,000 people (27 percent) will remain without water service.
- 1.13 Several problems undermine the quality of water service in Asunción: (a) the reliability of the system in general is inadequate, with no water or low pressure at various points in the system, despite a sufficiently high volume of water; (b) the current level of unmetered water, estimated on the basis of the plant's production, is on the order of 40 percent; and (c) there are approximately 200 small private water supply systems providing services of dubious quality.
- 1.14 The quality of the water delivered by CORPOSANA to the consumer is acceptable and meets national and international physical, chemical,

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<sup>2/</sup> Concentrated rural population is that residing in localities of between 500 and 4,000 inhabitants.

and bacteriological standards. CORPOSANA routinely performs water quality analysis.

- 1.15 CORPOSANA has been making efforts to reduce the amount of unmetered water, with the support of the Bank through loan 818/SF-PR. CORPOSANA is installing master water meters for production centers and regulating tanks, in addition to 100,000 new household meters to replace damaged ones and cover new connections. With the support of a consulting firm financed by the Bank, CORPOSANA is also preparing a survey of the water distribution system of Asunción and a master file of consumers connected thereto, which will be incorporated into a geographical information system that is being purchased with the Bank's support.

b. Sewerage

- 1.16 Coverage of the existing sanitary sewerage system in Asunción is estimated at 40 percent. Sewage is discharged into the Paraguay River downstream from the uptake point, after pretreatment through screen chambers to remove thick solids. The low-water volume of the river is on the order 1,000 cubic meters per second, which allows the dumped sewage to dissolve sufficiently, without compromising future uses of the resource. The IBRD is in the process of approving a loan for a sewerage project in the metropolitan area of Asunción which will increase coverage from 40 percent to 60 percent (see paragraph 1.36).

5. Status of services outside the metropolitan area of Asunción

a. Water supply

- 1.17 While 42 percent of the urban population has water service (37 percent from CORPOSANA and five percent from individual providers), only 16 percent of the total rural population has access to water supply services.
- 1.18 In rural areas, 65 percent of the concentrated population is covered. The worst shortfall affects the scattered rural population, generally served through individual, low-cost systems (hand pumps), which the Bank has not financed in the past, since the rural sector in Paraguay has traditionally been assisted by the IBRD and KfW and GTZ of the Republic of Germany.
- 1.19 In the interior of Paraguay, 700,000 people in 34 towns with over 4,000 inhabitants have partial water service coverage, for a total of approximately 180,000 inhabitants. These systems do not have master water meters to measure losses. Production is estimated on the basis of pumping or operating hours of the water purification plants and only a few towns have household meters on a limited basis.

- 1.20 With regard to water quality in urban areas, aside from the city of Asunción, there are only seven cities with water supply systems that use properly-treated surface water. Other public systems use groundwater of reliable quality. In general, the service coverage of those systems is not extensive, particularly in the case of those run by sanitation boards. In rural areas, SENASA is responsible for supervising water supply quality and does so in a limited way.

b. Sewerage

- 1.21 Of the 34 towns mentioned, only four have sewerage systems. It is estimated that only 3.3 percent of the population in these towns has access to this service.

6. Operation and maintenance

- 1.22 CORPOSANA's services are centrally organized, from Asunción, through four regional offices in the interior of the country that operate the services and execute small works. Since there is no master file of equipment at the regional level, however, not all the operational aspects of the various systems are properly covered and the regional offices have to turn to Asunción each time major equipment needs repair. Because of the lack of proper routine preventive maintenance, the equipment is in poor condition and the maintenance performed is in the form of repairs.

7. Conclusion

- 1.23 Currently, 2.9 million people in Paraguay do not receive adequate water service. In addition, 3.7 million people have no access to sanitary sewerage systems. The estimated cost of building water supply systems to cover the entire population lacking the service is approximately US\$435 million. If the entire population without conventional sewerage systems and the population with individual systems required a sanitary sewerage system, an investment of US\$925 million would be in order.

C. Environmental considerations

- 1.24 Paraguay does not have an overall environmental protection policy or a structure and central executive procedures to address environmental issues in the country fully and systematically. To date, these issues have been approached piecemeal, with responsibility delegated to three institutions attached to different ministries: (a) the Office of the Deputy Secretary of State for Natural Resources and the Environment (SSERNMA), attached to the Ministry of Agriculture, which is in charge of management of renewable natural resources, forests, watersheds, and national parks; (b) CORPOSANA, an agency of the Ministry of the Interior; and (c) the National Environmental Sanitation Authority (SENASA) of the

Ministry of Health, involved in everything related to public health and human interaction with the environment.

- 1.25 In view of the weak legal and institutional structure for Paraguay's environmental management, the Bank's operations program in the country includes a national environmental protection program (PR-0017), the objective of which is to support consolidation of sound and efficient public management of the environment and natural resources, through institutional strengthening, legal reform, technical assistance, and funding of investment projects. It should be noted that technical assistance will focus on installing a central environmental management system, based on a flexible structure at a high level of government, that will encourage wide-ranging participation by the private sector, and whose functions will include policy-setting, the issuing of laws and regulations, as well as environmental quality monitoring, supervision, and control.
- 1.26 The existing institutional structure for environmental matters in Paraguay does not allow for effective control of industrial pollution. Despite the fact that Paraguay is not heavily industrialized, industrial pollution contributes to the marked degradation of soil, surface waters, and groundwater. In addition, industries, for the most part agroindustries, are located near or within city cores and, as a result, in some of the areas covered by this program, uncontrolled industrial pollution may render the construction of domestic sewage treatment plants ineffective, because the receiving environments would continue to show a high level of deterioration. The proposed program provides for activities designed to get industry to commit to a plan and schedule to control the pollution (see chapter III, Environmental considerations).

D. Government strategy for the sector

- 1.27 The government's policy for the sector emphasizes the financial self-sufficiency of public utilities, coverage and quality of sanitation services, and promotion of private-sector participation of various types in public-service delivery.

E. Bank strategy

- 1.28 The Bank's strategy for the country, consistent with the government's policy, gives priority to supporting low-income groups and protecting the environment. With regard to the sanitation sector, its priorities include the need to support the country in: (a) designing, developing, and implementing a new legal and institutional framework for the sanitation sector; and (b) reducing the serious service coverage deficiencies by building, expanding, and reconditioning water and sanitation systems.

F. Participation of the Bank

- 1.29 The Bank has played a major role in financing Paraguay's water supply and sewerage sector. From 1965 to 1992, it granted investment loans and technical-cooperation funding totaling approximately US\$90.1 million, with emphasis on the urban sector.
- 1.30 As part of its support for the sector, the Bank financed the following studies: (a) master plan for the expansion of Asunción's water supply system; (b) analysis of the sector and its medium- and long-term financing, which concluded that the works included in the proposed program are of the highest priority for the country; (c) rate structure for CORPOSANA's water supply and sewerage systems; and (d) current status of CORPOSANA's operation and maintenance systems. The results of the last two studies were used in preparing the proposed program.
- 1.31 Loan 818/SF-PR, signed on September 16, 1988, in the amount of US\$47.8 million, is the only project currently under way. CORPOSANA is the executing agency. The purpose of the project, cofinanced with the French government, is to expand the existing water supply system in the metropolitan area of Asunción, to increase coverage from 63 percent of the population in 1988 to 73 percent in 1995. The project involves construction of intake works on the Paraguay River, a treatment plant, raw and treated water pumping stations, conveyance lines, distribution centers and systems, and installation of 100,000 meters for existing household connections and for the 30,000 connections to be installed under the project. Furthermore, the project includes a technical-cooperation component of institutional strengthening for CORPOSANA, for the design and implementation of a new organizational structure for the utility. Resources from the loan were used to prepare studies and designs for the program proposed in this document, including a review and update of the master plan for the water supply system of Asunción. The original project was divided into stages because of CORPOSANA's financial limitations. The second stage, which is part of the proposed program, will consist of additional water regulation and distribution works in the metropolitan area of Asunción.
- 1.32 The project is in its final stage of execution, with a weighted advance of 96 percent. The technical-cooperation component involving institutional strengthening has been fully executed. With the exception of household connections, of which 10,000 units remain to be installed, all other project works have been completed and are in operation. Ninety-five percent of the loan has been disbursed and the project is expected to be finished during the first six months of 1995.
- 1.33 The project was delayed during the initial stage of its execution for some 12 months, primarily because of: (a) delays in the hiring of the consulting firm to supervise the works, because of holdups

in the selection process and claims arising from the award process; and (b) difficulties in revising and updating certain designs and in preparing the bidding documents, duties that were to have been performed by the supervisory firm. Past the initial stage, beginning in the fourth quarter of 1989, the project moved at a steady pace and the principal works were properly constructed. Oversight of the works, both by the supervisory firm and CORPOSANA, was satisfactory.

G. Participation of other institutions

- 1.34 Participation by other countries and international financial institutions can be summarized as follows: (a) Germany (KfW/GTZ) provided financing to SENASA for a rural water supply and sanitation project in the Departments of Concepción, Amambay, San Pedro, and Canendiyú, totaling approximately US\$3.2 million, to benefit some 63,000 inhabitants (project completed); (b) France cofinanced the first stage of the water supply project for the metropolitan area of Asunción for CORPOSANA (loan 818/SF-PR), with a contribution of approximately US\$22 million (project under way); and (c) the IBRD supported the sector through: (i) IBRD project I, for US\$6 million, to benefit 82,000 inhabitants with 47 rural water supply systems (project completed in 1985); (ii) IBRD II, for US\$11.8 million, to benefit 61,000 inhabitants of 51 communities (project completed in 1990); and (iii) IBRD III, for US\$23 million, approved in 1992, to supply water to 150 communities, thereby benefiting 250,000 inhabitants, and install pit latrines for 50,000 families (project under way).
- 1.35 In addition, in February 1995 the IBRD approved a loan for a sanitary sewerage project in the Itay watershed, in Asunción. The project consists of the construction of a sewerage system, intercepting sewers, and a pretreatment plant for final discharge into the Paraguay River downstream from the city's intake, and a technical-assistance component for decentralization of the sector. The project will benefit 250,000 inhabitants at an estimated total cost of US\$72.2 million, of which the IBRD will finance US\$46.5 million, the European Investment Bank, US\$20 million, and CORPOSANA, US\$5.7 million.

H. Lessons learned and design of the proposed program

- 1.36 The primary lessons derived from experience in the execution of the operations financed by the Bank that are relevant to the design of the proposed program are the following: (a) CORPOSANA has demonstrated ample capacity as executing agency for investment projects; (b) the public bidding system for goods and services has operated adequately; (c) CORPOSANA did not show sufficient capacity for executing works on force account; (d) CORPOSANA does not have the installed capacity for project preparation and evaluation, which activities should be performed by consulting firms; and

(e) supervision of project execution should be done through specialized consulting firms.

- 1.37 The proposed program, described in the following chapter, was designed and sized taking into account: (a) the sector's identified needs; (b) the government's sector policy; (c) the Bank's strategy for the country; (d) past experience in the execution of the projects in the sector; (e) coordination with activities financed by other international organizations, particularly the IBRD; and (f) the availability of local resources for the sector.

## II. THE PROGRAM, ITS COST AND FINANCING

### A. Objectives

- 2.1 The objectives of the proposed program are to: (a) support the establishment of a new legal and institutional framework for the sanitation sector; (b) improve the technical, financial, administrative, and business efficiency of CORPOSANA; and (c) improve the living conditions of residents of the metropolitan area of Asunción and cities in Paraguay's interior, by increasing water supply and sewerage system coverage.

### B. Goals and impact of the program

- 2.2 The goals of project execution are as follows:

- a. For the sector: (i) establish an autonomous regulatory agency for the sector within 18 months after the start of program execution; and (ii) implement a new legal and institutional structure within 24 months after the beginning of program execution.
- b. For CORPOSANA, by completion of the program: (i) reduce unmetered water from 40 percent to 28 percent; (ii) improve the utility's ability to obtain the resources necessary to finance the expansion of its water supply and sewerage systems; (iii) improve efficiency in collections in order for accounts receivable for services at December 31, 2000, to represent the equivalent of 40 days of billing; and (iv) decrease the ratio of employees to connections from 7.1 per 1,000 to 5 per 1,000.
- c. For the works component in the metropolitan area of Asunción: (i) build 18 water consumption regulating tanks, with a total capacity of 63,000 cubic meters; (ii) install 66 kilometers of conveyance lines and 275 kilometers of distribution lines; and (iii) install 36,700 metered household connections, benefiting some 147,000 people, thereby increasing water supply coverage from 73 percent to 83 percent.
- d. For the multiple-works component in cities in the interior: expand or install the water supply system and expand or install the sewage collection, treatment, and final disposal systems in 10 towns, thereby benefiting some 125,000 people.

### C. Description

- 2.3 In order to achieve the objectives and goals indicated above, the program has been designed with the following works and activities:



- a. Consulting services will be provided for: (i) development of a legal and institutional framework for Paraguay's water and sanitation sector; (ii) preparation of feasibility studies and final designs for additional projects under the component for works in cities in the interior; and (iii) program management, including: preparation and analysis of bidding, supervision of consultants and works, supervision of design preparation and review of project feasibility studies, procurement of materials and equipment, drafting of progress reports, and preparation of documents for rendering accounts to the Bank.
- b. Consulting services will be provided for the institutional strengthening of CORPOSANA and will include: (i) review of CORPOSANA's business, accounting, and financial systems, in order to identify existing problems clearly and make recommendations; (ii) development of an information systems plan for CORPOSANA in order to guide the procurement of equipment and programs; (iii) implementation of the recommendations regarding the systems review; (iv) internal audit support to make the process more efficient; (v) training for CORPOSANA staff to better meet the utility's needs; (vi) preparation of a management information system to support CORPOSANA in its decision-making process; (vii) decentralization of CORPOSANA's systems operation and maintenance; and (viii) reduction of unmetered water, including the design of a plan to divide Asunción's water distribution system into sectors, with updates of system surveys and consumer master files.
- c. Specific works in the metropolitan area of Asunción will include: (i) increased raw-water pumping capacity; (ii) conveyance lines for the main system; (iii) regulating tanks and equipment for the distribution centers; (iv) secondary distribution system and household connections; and (v) establishment of pitometric districts.
- d. Multiple works in cities in the interior will include expansion or installation of water supply systems and expansion or installation of sewage collection, treatment, and final disposal systems.

D. Participation by the Multilateral Investment Fund (MIF)

- 2.4 The MIF is expected to participate in the program by financing the component for the design and implementation of the sector's legal and institutional framework. The presence of the MIF in this operation is significant because it will strengthen the government's decision to implement sector reforms, the result of which will be the sector's increased efficiency and expanded motivation for private-sector participation. This operation is being conducted at the same time as the proposed program and the MIF profile has already been distributed to the Programming Committee.

Approval by the Donors Committee is expected during the first quarter of 1995.

E. Scaling of the multiple-works component

- 2.5 The scaling of the multiple-works component was defined taking into consideration actual demand for water supply and sewerage services, the size and quality of the representative sample, the financial and executing capacity of CORPOSANA, the type of management and supervision proposed, and the level of indebtedness acceptable to the government. These issues are discussed in detail in the respective chapters of the document.

F. Cost of the program

- 2.6 The total cost of the program has been estimated at the equivalent of US\$140 million. The breakdown by source of financing and investment category is shown in the following table. The criteria and methodology used in preparing the budgets are considered acceptable.

COSTS (US\$000s)							
CATEGORY	TOTAL BY FUND						
	IDB-OC	IDB-IFF	MIF	OECF	LOCAL	TOTAL	%
<b>ENGINEERING AND ADMINISTRATION</b>	<b>6,310</b>	-	-	<b>2,000</b>	<b>250</b>	<b>8,560</b>	<b>6.1</b>
Studies and designs	810	-	-	-	-	810	0.6
Supervision and administration	5,500	-	-	2,000	250	7,750	5.5
<b>DIRECT COSTS</b>	<b>30,685</b>	<b>28,300</b>	<b>900</b>	<b>43,500</b>	<b>200</b>	<b>103,585</b>	<b>73.9</b>
Water supply- Asunción	12,100	-	-	43,500	-	55,600	39.7
Legal and institutional framework	-	-	900	-	200	1,100	0.8
Institutional strengthening	6,885	-	-	-	-	6,885	4.9
Accounting, financial, and business systems review	350	-	-	-	-	350	0.3
Information systems plan	1,000	-	-	-	-	1,000	0.7
Implementation of accounting, financial, and business systems	600	-	-	-	-	600	0.4
Support for internal audit	80	-	-	-	-	80	0.1
Staff training	300	-	-	-	-	300	0.2
Management information systems	55	-	-	-	-	55	0.1
Unmetered water reduction	3,500	-	-	-	-	3,500	2.4
Operation and maintenance	1,000	-	-	-	-	1,000	0.7
Water supply and sanitation in cities in the interior	11,700	28,300	-	-	-	40,000	28.5
<b>ASSOCIATED COSTS</b>	<b>2,000</b>	-	-	-	<b>1,500</b>	<b>3,500</b>	<b>2.5</b>
Land and easements	-	-	-	-	1,500	1,500	1.0
Fund for individual sanitation systems and household connections	2,000	-	-	-	-	2,000	1.4
<b>UNALLOCATED</b>	<b>2,400</b>	-	<b>80</b>	<b>6,720</b>	<b>205</b>	<b>9,405</b>	<b>6.8</b>
Contingencies and cost escalation	2,400	-	80	6,720	205	9,405	6.8
<b>FINANCE CHARGES</b>	<b>8,205</b>	<b>1,700</b>	-	-	<b>5,045</b>	<b>14,950</b>	<b>10.7</b>
Interest	7,710	1,400	-	-	3,692	12,802	9.1
Credit fee	-	-	-	-	1,353	1,353	1.0
Inspection and supervision	495	300	-	-	-	795	0.6
<b>T O T A L</b>	<b>49,600</b>	<b>30,000</b>	<b>980</b>	<b>52,220</b>	<b>7,200</b>	<b>140,000</b>	<b>100.0</b>
<b>%</b>	<b>35.5</b>	<b>21.4</b>	<b>0.7</b>	<b>37.3</b>	<b>5.1</b>	<b>100.0</b>	

2.7 The main investment categories are described below:

1. Engineering and administration (US\$8,560,000)

2.8 This category, which represents 6.1 percent of the total program cost, comprises the following subcategories:

a. Studies and designs (US\$810,000). This item includes the consulting services needed to support CORPOSANA in identifying the technical issues that may emerge during the construction of works and the preparation of feasibility studies and final designs for the additional projects under the component for works in cities in the interior.

- b. **Supervision and administration (US\$7,750,000).** This item includes program management and supervision by consulting firms, the cost of vehicles required for supervision of the works, and administrative costs.

2. Direct costs (US\$103,585,000)

- 2.9 This category represents 73.9 percent of total program cost and includes the following subcategories:

- a. **Water supply in Asunción (US\$55,600,000).** The estimated amount includes labor, materials, and equipment needed to execute the civil works, as well as procurement and assembly of electromechanical equipment that is part of Asunción's water supply system's expansion: production (US\$1,320,000); conveyance (US\$22,100,000); regulating and distribution centers (US\$14,500,000); and distribution systems, including metered household connections (US\$17,680,000).
- b. **Legal and institutional framework for the sector (US\$1,100,000).** This amount includes contracts for consultants to prepare the new regulatory framework for the water supply and sewerage sector of Paraguay.
- c. **Institutional strengthening (US\$6,885,000).** This item includes studies and projects needed for CORPOSANA to implement or expand the following programs: reduction of unmetered water, improved operations and maintenance, marketing, accounting, and financial systems, management information systems, and increased efficiency in internal auditing. This item also includes an information systems plan and a plan for staff training in various areas of the utility.
- d. **Water supply and sanitation in cities in the interior (US\$40,000,000).** The amount was estimated on the basis of the budgets from projects in the representative sample for this program and an evaluation of the potential and actual demand for this type of project in the country. Contingencies and cost escalation are included, as this is a multiple-works component.

3. Associated costs (US\$3,500,000)

- 2.10 The value of the land (US\$1,500,000) was calculated based on the area required for the various works. The unit cost used was based on recent purchases by CORPOSANA.
- 2.11 The unit costs of the individual systems for sewage disposal and in-house connections was estimated using the cost of a standard

installation. The amount allocated was also based on an estimate of the demand for this type of installation.

4. Unallocated costs (US\$9,405,000)

- 2.12 This category, which represents 6.8 percent of the total cost, includes a possible cost increase resulting from contingencies and escalation in specific program components. The contingencies were estimated as 15 percent of direct costs and escalation on the basis of exchange rate and inflation forecasts estimated in June of 1994 was zero.

5. Finance charges (US\$14,950,000)

- 2.13 This category, which represents 10.7 percent of total cost, includes: (a) interest that will accrue during the execution period (US\$12,802,000); (b) the credit fee (US\$1,353,000); and (c) costs of program inspection and supervision by the Bank (US\$795,000).

G. Financing of the program

1. IDB

- 2.14 The Bank will finance 56.9 percent of the total cost of the program, i.e., US\$79.6 million equivalent from the ordinary capital to be disbursed in foreign exchange, pursuant to the Bank's policies. Of this financing, US\$30 million will be comprised of IFF resources, to which Paraguay is entitled pursuant to the Eighth General Increase in Resources of the Bank.

2. MIF

- 2.15 MIF funds will be used exclusively to finance studies on the sector's regulatory framework. The amount proposed comes to 0.7 percent of the program cost, equivalent to US\$980,000, to be disbursed in foreign exchange pursuant to MIF policy.

3. OECF

- 2.16 The Overseas Economic Cooperation Fund (OECF) of the Japanese government will finance 37.3 percent of the program, equal to US\$52.22 million, which will be used for the construction and supervision of the works to expand the water supply system in the metropolitan area of Asunción. The borrower must submit evidence that the OECF's commitment to finance the program has been formalized as a condition precedent to the first disbursement under the operation. 3/

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3/ See conditions precedent.

4. Local contribution

- 2.17 CORPOSANA's investment fund will be the source of the local contribution, in the amount of US\$7.2 million equivalent, representing 5.1 percent of the program's total cost.

5. Terms and conditions of the financing

- 2.18 The following terms and conditions will govern the proposed loans:

FUND	IDB OC and OC-IFF	MIF	OECF <u>b/</u>
Interest rate	variable <u>c/</u>	<u>a/</u>	3.0
Credit fee	0.75%	<u>a/</u>	-
Inspection and supervision	1.0%	<u>a/</u>	-
Disbursement period	5 years	<u>a/</u>	5 years
Grace period	5 years	<u>a/</u>	10 years
Amortization period (including grace period)	25 years	<u>a/</u>	30 years

a/ MIF funding would be granted on a nonreimbursable basis.

b/ The terms and conditions of the proposed OECF loan will be defined by the Government of Japan. Those shown in this table are for purposes of illustration and reflect the ones established for other recent projects financed by the OECF in Paraguay.

c/ In the case of financing with OC-IFF resources, the interest rate will be reduced by up to five percentage points.

### III. PROGRAM EXECUTION

#### A. Executing agency

- 3.1 Program execution will be the responsibility of the Corporación de Obras Sanitarias [Sanitation Works Authority] (CORPOSANA), which will hire a specialized management firm. The component for the design of a regulatory framework for the water supply and sanitation sector, to be financed by the MIF, will be carried out by the Ministry of Finance.

#### B. Arrangements for execution

##### 1. Program management and supervision

- 3.2 Given that CORPOSANA is seeking to outsource activities that could be performed more efficiently by the private sector, the program provides for the hiring of a management firm for the program. This firm will be in charge of issuing calls for bids, preparing terms of reference for the unmetered water and improved operations and maintenance programs, contracting the other consulting and construction firms as well as the related goods and services providers, reviewing and evaluating the projects added to the multiple-works component, and any other technical or administrative activity required for program execution. Supervision of the works will be the responsibility of specialized firms hired by the management firm.
- 3.3 CORPOSANA will have the final approval over documents prepared by the management firm with respect to bidding, procurement, payments to suppliers, contractors' estimates for payment, and submission to the Bank of receipts for payment. CORPOSANA will appoint a program coordination group responsible for liaison with the management firm and the Bank. The firm must be hired and the coordination group appointed as conditions precedent to the first disbursement. <sup>4/</sup>
- 3.4 With respect to the supervision of works to be constructed as part of the water supply system of Asunción, a consulting firm will be hired in accordance with the OECF's procedures.

##### 2. Separate component

- 3.5 The part of the program for the water supply system in Asunción has been designed as a specific project due to the integral nature and interdependence of its components. An international consulting firm was hired by CORPOSANA to prepare the studies and designs of the works.

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<sup>4/</sup> See conditions precedent.

### 3. Global multiple-works component

- 3.6 Because the component for water supply and sewage collection, treatment, final disposal in cities in the interior is made up of similar independent projects, it will be executed as a global multiple-works project. CORPOSANA contracted out the design of the water supply and sanitation projects for eight cities in the interior to a consortium of consulting firms. The representative sample of the global multiple-works component was chosen from this group of projects.

### 4. Construction of the systems

- 3.7 Prior to the construction of any pipelines in the secondary systems, either for water distribution or sewage collection, CORPOSANA must submit evidence that at least 65 percent of the direct beneficiaries of such construction have expressed interest in being connected to the systems. 5/

### C. Status of preparation of the works components

#### 1. Water supply system in Asunción

- 3.8 A feasibility study was prepared for the component for expansion of Asunción's water supply system and the least-cost alternative was selected. Inasmuch as the component constitutes an expansion, the alternatives studied were based on the route of certain water mains and the location of the regulating tanks. The final design of the system's various components, for the purposes of issuing calls for bids for the works, was completed at the end of 1994 and is consistent with generally accepted engineering standards.

#### 2. Water supply and sanitation in cities in the interior

- 3.9 Of the universe of 34 towns with over 4,000 inhabitants, CORPOSANA chose 12 for projects with a direct cost of approximately US\$40 million, to make up the representative sample for the multiple-works component. As a result of the technical, socioeconomic, and environmental assessments conducted, eight viable projects were selected, of which five are for water supply and three for sanitary sewerage. The direct cost of these projects totals US\$14 million, excluding taxes, escalation, and contingencies, which represents 35 percent of the direct cost of the program's multiple-works component. In addition, water supply and sanitation projects are being prepared for two other towns. The remaining projects will be prepared with resources from the proposed program.

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5/ See contractual conditions.



D. Eligibility criteria for the multiple-works component

3.10 The program's multiple-works component will be governed by the following eligibility criteria:

- a. Eligibility criteria for the cities: eligible cities will be those under CORPOSANA's responsibility.
- b. General eligibility criteria for water supply and sewerage projects: (i) the project must represent the least-cost solution, including investment, operation, and incremental maintenance, calculated at present value using a discount rate of 12 percent; (ii) the project's cost-benefit benefit analysis must show an economic internal rate of return of at least 12 percent; (iii) it must be guaranteed that at least 85 percent of the beneficiary population will not be spending more than three percent of family income for the minimum level of water supply or five percent of family income for water supply and sewerage service or, alternatively, a low-income users' subsidy plan acceptable to the Bank must be presented; and (iv) an environmental assessment report must be completed, pursuant to the terms of reference used for the analysis of projects in the representative sample.
- c. Specific criteria for water supply projects: (i) a reliable source of water must be available with a sufficient volume and of the proper quality to satisfy demand for a design period of approximately 20 years and legal instruments must be in force to guarantee the use of the source for that period; if ground-water is used, the results of the tests conducted in the drilled well or wells must be available; (ii) measures must be taken to avoid the impact of increased sewage, for which purpose studies and designs will be prepared, sanitary sewerage projects will be carried out, and nonconventional systems will be installed, including treatment and disposal of liquid and solid waste from septic tanks or works to improve the existing sanitation systems. These studies, designs, and works may be financed, if necessary, with resources from this program; and (iii) in the case of existing systems that are to be expanded, a program to reduce unmetered water, including physical and business losses, will be carried out.
- d. Specific criteria for sanitary sewerage projects: (i) the town's water supply system must be operated and maintained in accordance with generally accepted engineering practices; and (ii) the level of sewage treatment must be determined taking into account the self-cleaning capacity of the receiving body and the subsequent uses of the water.

E. Execution of the consulting services components

- 3.11 The program provides for the hiring of consulting firms to carry out the various components. Information on execution of these components is presented below.

1. Execution of the component for the design of a regulatory framework for the water supply and sanitation sector

- 3.12 This component will be carried out by the Ministry of Finance (through the Privatization Council), in association with the Ministries of the Interior and Health, since these ministries are involved in the sector, and in coordination with the government's privatization efforts. As a condition precedent to the first disbursement, a consulting firm will be hired to carry out this component. 6/

2. Execution of the institutional strengthening component

- 3.13 In order to promote the institutional strengthening of CORPOSANA, the program provides for consultants to be brought into the various departments of the utility, as described below. The measures recommended by the consultants will be reflected in an implementation plan and schedule, which must be prepared by the management firm and submitted by CORPOSANA to the Bank for approval within 24 months after the effective date of the contract. 7/

a. Systems review

- 3.14 A review of the business, accounting, and financial systems will be conducted, with emphasis on: the consumer master file; metering, billing, and collections; inventory control; accounts payable to goods and services providers; cash and deposits; fixed assets control; works in progress control; internal and external loan control; financial planning; and an evaluation of the extent to which the chart of accounts can be adapted to provide the information necessary to update rates based on long-term marginal costs and to serve as the basis for a management information system to be developed. In addition, the efficiency of CORPOSANA's internal auditing will be evaluated and a program to make it more efficient will be proposed.
- 3.15 A specialized firm other than the one carrying out the other institutional strengthening components will be hired to conduct the review. It must be hired within 12 months after the effective date of the contract. 8/ The consulting services are expected to last four months.

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6/ See conditions precedent.

7/ See contractual conditions.

8/ See contractual conditions.

b. Development of an information systems plan

- 3.16 In view of the fact that the utility will have various systems in its different areas, which must be compatible and allow for future expansion, it is essential to have clear definitions from the beginning of the types of systems and equipment that will be used to meet the current and future needs of CORPOSANA. For this reason, the hiring of the consulting firm is proposed as part of the program so that an information systems plan can be prepared and implemented and the computer equipment and programs deemed necessary for the plan can be purchased.
- 3.17 The design of an information systems plan must begin no later than two months after completion of the systems review. The consultants must be hired within 18 months after the effective date of the contract. 9/ A final report on the plan must be submitted within six months.

c. Support for the installation of the systems

- 3.18 On the basis of the recommendations contained in the final report on the systems review and in coordination with preparation of the information systems plan, a specialized firm will be hired to adjust the existing systems, develop any new systems needed, and support CORPOSANA staff in the installation of such systems. The firm must begin its work no later than four months after the systems review has been completed. The consultants must be hired within 21 months after the effective date of the contract, as will be shown in the plan and schedule for the implementation of all the studies and consulting services provided for under the program. 10/ This plan and schedule will be prepared by the management firm and must be approved by CORPOSANA and the Bank.

d. Support for internal auditing

- 3.19 An expert will be hired under the program to evaluate the efficiency of CORPOSANA's internal auditing, to propose measures needed to correct any deficiencies detected, and to support the implementation of such measures.

e. Staff training

- 3.20 CORPOSANA currently has an oversized staff, with officers who in many cases do not have the training necessary to properly carry out their duties. In addition to training staff members to enable them to carry out their current duties more efficiently, the program provides for training for employees working in overstaffed areas,

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9/ See contractual conditions.

10/ See contractual conditions.

so that they can eventually be transferred to areas where they are actually needed.

- 3.21 To that end, a firm will be hired to identify CORPOSANA's needs and develop and implement a staff training plan, which will include a job and wage plan. It is estimated that the identification and plan design stage will take four months and that plan execution will take 15 months. The consultants must be hired within a period of 15 months from the effective date of the loan contract. 11/

f. Management information systems

- 3.22 Consultants will be hired to develop and implement a management information system that will provide CORPOSANA with the information it needs, on a timely basis, for the decision-making process.

g. Unmetered water

- 3.23 Consultants will be hired to prepare a plan to divide the system into sectors, including pitometric districts. A specialized firm will be hired to implement the plan. The proposed program also provides for the procurement of the equipment necessary to control physical losses and includes an update of: (a) the systems and facilities inventory and the consumer master files; and (b) the systems and procedures for meter maintenance and reading, billing, and collections. The consultants for the sector plan will be hired within 12 months after the effective date of the contract. 12/ The contract for implementation of the sector plan will be awarded by public bidding in accordance with the plan and schedule for implementation of all the studies and consulting services proposed under the program. The terms of reference for these consulting services will be drawn up by the management firm.

h. Operation and maintenance

- 3.24 CORPOSANA will be responsible for operating and maintaining all the systems expanded or built under the proposed program. Currently, operation and maintenance activities are performed improperly, according to the diagnostic study conducted during preparation of this operation. To remedy the situation, a consulting firm will be hired to help implement the recommendations contained in the above-mentioned study. Among other measures, the recommendations include: (a) decentralizing the operation and maintenance of systems; (b) instituting routine preventive maintenance and anticipating breakdowns; (c) modifying workers' shifts to make them more efficient; and (d) preparing a computerized survey of equipment and the maintenance program therefor. The consulting firm will be hired within 12 months after the effective date of the loan

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11/ See contractual conditions.

12/ See contractual conditions.

contract. 13/ The management firm will prepare the terms of reference for the consultants.

- 3.25 In addition to the above, once the first works are completed, CORPOSANA will be required to present annual maintenance plans and programs for 10 years. 14/

F. Fund for the financing of individual sanitation systems and in-house connections

- 3.26 In order to help low-income beneficiaries improve their sanitary conditions, a revolving fund will be set up with resources from the program to finance either individual domestic waste disposal systems or connections to public sanitary sewerage systems built under the program. An estimated US\$2 million will be allocated to the fund, with which some 20,000 individual sanitation systems and connections will be financed during the five years of program execution.

- 3.27 The maximum amount for each individual system to be financed would be US\$200. The amortization period for the loans will be 36 months. Monthly installments will be collected together with water and sewerage service bills. The interest rates to be applied to these loans will be those used by the private banking system for loans over equivalent periods.

- 3.28 CORPOSANA will manage the fund, for which purpose a special account will be opened. CORPOSANA will submit the operating regulations of the fund, to the Bank's satisfaction, within six months after the effective date of the contract. The fund will be set up with the respective resources within 12 months after the effective date of the contract. 15/

G. Land, titles, and easements

- 3.29 Generally speaking, the proposed program will present no major problems in terms of acquisition of land, since a large part of the works, such as the water distribution and sanitary sewerage systems, will be constructed on public thoroughfares. However, a few works will require the purchase of land, and this process is under way.

- 3.30 The costs of purchasing land are included in the program costs and will be financed with resources from the local counterpart. No difficulties or conflicts in the purchase of the land needed to carry out the program are anticipated because, as a last resort, the law allows expropriation of land for the purposes of public

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13/ See contractual conditions.

14/ See contractual conditions.

15/ See contractual conditions.

utility. Nevertheless, prior to issuing a call for bids for a specific construction project, CORPOSANA must demonstrate its ownership and the availability of the land needed for the construction.

H. Execution schedule, deadline for physical initiation of the multiple-works component, and investment schedule

- 3.31 The term for disbursement of loan resources will be five years. This period was determined after a detailed analysis was conducted of the execution of all program components, including the periods needed for bidding, based on prior experience acquired during the first stage of the Asunción water supply project. A period of four years is proposed for physical initiation of the works. 16/
- 3.32 The following table shows a summary of the investment schedule for the program. Detailed information can be found in Region 1's technical files.

(in US\$000s equivalent)						
YEAR	IDB	MIF	OECF	LOCAL	TOTAL	%
1	8,881	440	5,443	1,639	16,403	11,7
2	15,638	540	10,445	1,507	28,130	20,1
3	19,940	-	15,448	1,102	36,490	26,1
4	19,308	-	12,940	1,390	33,638	24,0
5	15,833	-	7,944	1,562	25,339	18,1
TOTAL	79,600	980	52,220	7,200	140,000	100
%	56.9	0.7	37.3	5.1	100	-

I. Bidding procedures and schedule

- 3.33 The Bank's bidding procedures, set forth in Annex B to the loan contract, will be followed for the procurement of goods and services and the awarding of construction contracts. International public bidding will be compulsory for contract amounts in excess of US\$250,000 for goods and services and US\$2 million for construction projects. These thresholds are consistent with those recommended for the sector in Paraguay by the Bank's Procurement Unit. For the awarding of construction contracts and the procurement of goods and services in amounts below the above-mentioned thresholds, national legislation, which is consistent with the Bank's procedures, will

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16/ See contractual conditions.

be followed. An estimated 80 percent of the bidding required for program execution is thus expected to be international. Contracts for consulting services will be awarded in accordance with the procedures set forth in Annex C to the loan contract.

3.34 Construction and procurement contracts will be grouped into packages as indicated in the following schedule.

BIDDING SCHEDULE						COSTS US\$000s
BIDDING	YR 1	YR 2	YR 3	YR 4	YR 5	
Procurement of goods						
Pipe and valves	...	==XX	XXXXX			25,000
Machinery and equipment	...	==XX	XXXXX			8,000
Master and household meters	...	==XX	XXXXX			6,500
Vehicles	...	==XX				60
Misc. equipment	...	==XX	XXXXX	XXXXXX		3,200
Computer equipment and programs			..==	XXXX		350
Civil works and assembly						
Asunción						
Water mains	...	==XX	XXXXX	XXXXX		13,000
Regulating tanks	...	==XX	XXXXX	XXXXX	XXX	8,000
Pumping stations	...	==XX	XXXXX	XXXXX		1,000
System and connections	...	==XX	XXXXX	XXXXX	XXXXXX	9,000
Water supply - other cities						
San Antonio	...	==XX	XXXXX	XXX		800
Caacupé	...	==XX	XXXXX	X		600
Caaguazu	...	==XX	XXXXX	XXXXX		2,500
Villarrica and Coronel Oviedo	...	==XX	XXXXX			1,000
Others		...	==XX	XXXXX	XXXXXX	4,500
Sewerage - other cities						
San Antonio	...	==XX	XXXXX	XXX		500
Caaguazu	...	==XX	XXXXX	XXXXX		2,000
Villarrica	...	==XX	XXXXX	XXXXX		1,500
Others		...	==XX	XXXXX	XXXXXX	5,500
Consultants						
Management firm	==XXX	XXXXX	XXXXX	XXXXX	XXXXXX	2,750
Supervising firms	==XXX	XXXXXX	XXXXX	XXXXX	XXXXXX	5,000
Systems review		..==	XXXXX	XXXXX		350
Information systems plan		..==	XXXXX	XXXXX		650
Systems development and implementation		..==	XXXXX	XXXXX		600
Internal audit strengthening		..==	XXXXX	XXXXX		80
Staff training plan		..==	XXXXX	XXXXX		300
Reduction of unmetered water		..==	XXXXX	XXXXX		500
Operation and maintenance		..==	XXXXX	XXXXX		300
Sector's regulatory framework	..	==XX	XXXXX			1,100
Studies and designs	..	==XX	XXXXX	XXXXX		810
Key:       -Prequalification .....						
-Bidding       =====						
-Execution       XXXXXXXXXX						

#### J. Environmental considerations

3.35 At its meeting of March 8, 1994, the Environment Committee of the Bank classified this program as a Category III operation, based on

its potential impact on the environment. The Committee also considered the environmental summary of the program on October 18, 1994, the recommendations of which were incorporated into the program design and include the following most important measures: 17/

- a. In order to avoid inconveniences to the population and occupational injuries during the construction phase, CORPOSANA will prepare a document consolidating the environmental control procedures to be followed. This measure is included as a precaution, since the procedures are standard for works constructed with a minimum amount of control by the supervisory authority. The environmental control procedures document will be included in the bidding documents.
- b. With regard to water pollution caused by industrial establishments, hotels, etc., CORPOSANA must make the necessary institutional arrangements and submit the following information, prior to issuing each call for bids for sanitary sewerage works in a city:
  - (i) an inventory of the sources of pollution in the service area of the city in which the works are to be constructed; and
  - (ii) plans for the reduction of water pollution in the area of the city benefiting from the project. Such plans will cover main sources of pollution and will include goals, deadlines, and standards to be reached by each polluter and mechanisms to promote effluent treatment (tax incentives, etc.). The plans will include agreements signed by the responsible authorities and the polluters (industrial establishments, hotels, etc.), either through business associations or individually.
- c. With regard to the sectors of the metropolitan area of Asunción where only water supply systems will be installed and the areas of cities in the interior in which the water supply system coverage does not coincide with the sewerage system coverage, a campaign will be conducted that will include:
  - (i) an environmental education program;
  - (ii) financing for the construction of septic tanks to replace cesspools in areas that only have cesspools and for the construction of individual sanitation systems in areas that have no system at all; and

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17/ See contractual conditions.



(iii) financing for the reconditioning of existing individual systems.

- 3.36 This measure must be carried out by CORPOSANA, with program resources, through arrangements with local institutions, NGOs, and/or international agencies. CORPOSANA, through the management firm, will be responsible for implementing these measures. The utility will also be in charge of conducting surveys and implementing plans of action for execution of this component.
- 3.37 Monitoring and control of the quality of groundwater (in areas where individual sanitation systems predominate or near sludge disposal areas) and surface waters used as receiving bodies for sewage treatment plant effluents will be included in the national environmental protection project (PR-0017), expected to be considered by the Board of Executive Directors of the Bank during the first half of 1995.

K. Operation control and monitoring

- 3.38 The Bank's Country Office in Paraguay will be responsible for control and monitoring of program execution. The executing agency will submit semiannual progress reports to the Bank. 18/ If program execution is found to be unsatisfactory, the executing agency must submit the Bank, within 60 days after the latter's recommendations, the corrective measures it intends to take, along with the respective schedule for their implementation.
- 3.39 Any problems that arise during program execution and the solutions implemented will be recorded in the reports on the status of loans under execution prepared by the Country Office. A summary of these matters will be included in the annual report on the portfolio prepared at the beginning of each calendar year.
- 3.40 In order to guarantee effective implementation of the components for establishment of the regulatory framework and institutional strengthening of CORPOSANA, the achievement of which is expected to encourage private-sector participation in the delivery of water supply and sanitation services, the program provides for a review to be conducted 30 months after the effective date of the contract or before 50 percent of the financing has been committed, whichever comes first. This review will examine the progress made towards achieving the goals and the utility's performance ratios. If the review indicates a need for any adjustments in program execution, CORPOSANA will have 60 days to submit a plan for correcting the deficiencies noted. If the Bank believes that substantial progress has not been made in the implementation of the regulatory framework

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18/ See contractual conditions.

or in the improvement of CORPOSANA's productivity indexes, it may suspend disbursement of uncommitted resources. 19/

- 3.41 The results of program execution will be evaluated by the Bank within 90 days after the final disbursement of the loan and the project completion report will be prepared by the Country Office in Paraguay, with the support of the project team.

L. Institutional strengthening performance indicators

- 3.42 Primarily the following indicators will be used to evaluate the institutional strengthening of CORPOSANA: 20/

Performance indicators	After 30 months	End of program
1. Operational		
- minimum pressure in distribution system	8 meters (water gage column)	8 meters (water gage column)
- household meter coverage	70%	90%
- percentage of unmetered water	35%	28%
- quality of water supplied	internat. standards	internat. standards
- number of staff per 1,000 connections	6	5
- average time to repair visible leaks	4 days	2 days
- number of equipment stoppages per month from lack of maintenance and average time of stoppage	15 units and 7 days	15 units and 7 days
2. Commercial		
- percentage of meters read/number of meters installed	80%	95%
- average number of days for billing and collection	40 and 50 days	30 and 40 days
- consumer service efficiency, measured by the average number of days to deal with complaints	5 days	3 days
3. Financial <u>21/</u>		
- ratio net profits/total income	14%	18%
- total operating costs/income from fees	75%	71%
- return on net utility investment in systems	3.5%	3.9%

M. Collection of data and ex post evaluation

- 3.43 The executing agency will gather and process data for an ex post evaluation of the outcome of the program. 22/ These processed data will be submitted to the Bank in reports beginning in the second year of program execution and annually until its completion. The first report will also give a detailed description of the procedure for compiling and processing the annual data. If the Bank decides to conduct an ex post evaluation of the program, a specialized consulting firm will be hired and financed by the Bank or the necessary funds will be included in a future program for the sector.

19/ See contractual conditions.

20/ Fulfillment of the goals after 30 months is a contractual condition.

21/ See paragraph 5.11.

22/ See contractual conditions.

#### IV. INSTITUTIONAL AND FINANCIAL ANALYSIS

##### A. The borrower and the executing agency

- 4.1 The borrower will be the Republic of Paraguay, which will transfer to CORPOSANA, through the Ministry of Finance, the proceeds of the proposed loans from the Bank and the OECF, under the same terms and conditions as those set forth in the respective loan contracts. <sup>23/</sup> The executing agency for the program will be CORPOSANA, while the executing agency for the component for the design of a legal and institutional framework for the water and sewerage sector will be the Ministry of Finance.

##### B. CORPOSANA

###### 1. Institutional analysis

###### a. Background

- 4.2 CORPOSANA was created in 1954 and is an independent, permanent agency, with legal status, and its own administration, accounting, and assets. CORPOSANA is connected to the Executive Branch through the Ministry of the Interior.

###### b. Functions

- 4.3 The purpose of CORPOSANA is to fully satisfy the water supply and sanitary sewerage needs of the population in cities with more 4,000 inhabitants in the eastern part of the country. CORPOSANA also has two other functions: (a) to regulate services and supervise water supply and sanitary sewerage systems throughout the country; and (b) to recommend to the Executive Branch the licensing of such services to other public or private entities. It is inappropriate and inefficient for CORPOSANA to perform such functions.
- 4.4 In order to remedy this problem and create a climate favorable to private investment in the sector, the program includes a component for the development of a new legal and institutional framework for the sector.

###### c. Organization and staff

- 4.5 Until 1988, CORPOSANA displayed serious institutional deficiencies. With the support of the Bank, through technical-cooperation operation ATP/SF-3082-PR (part of loan 818/SF-PR), a diagnostic study on the institutional situation was prepared and a proposal

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<sup>23/</sup> See conditions precedent.

for the reorganization of CORPOSANA was developed, which is at an advanced stage of implementation.

- 4.6 As part of the institutional support operation, a new organizational chart was developed for the utility, which was approved by its board of directors in December 1992. Approval of the organizational chart is pending in Congress and is expected during the first half of 1995.
- 4.7 CORPOSANA is overstaffed. The utility currently has 1,119 employees, of whom one percent are managerial, nine percent are professional, 33 percent are technical and specialized, 32 percent are administrative, and 25 percent are nonspecialized. According to international operational efficiency parameters, CORPOSANA should only need some 860 employees, that is, a ratio of five staff members per 1,000 connections. It is important to emphasize that, in this regard, the utility has been becoming more efficient in the last few years, with the ratio of employees to connections declining from 10.6 per 1,000 in 1987 to 7.1 per 1,000 in 1994. In five years, the utility hopes to reach a ratio of 5 per 1,000, as recommended in the above-mentioned study.
- 4.8 To achieve this goal, CORPOSANA has established a hiring freeze until the established ratio has been reached. However, employees will have to be relocated and trained in order to increase the utility's operational efficiency and this could create some difficulty in view of the agreements signed with labor organizations. As a result, the program will support CORPOSANA with the resources necessary to carry out the required training activities.

d. Financial and accounting administration

- 4.9 CORPOSANA's accounting system was revised by a consulting firm. The new system proposed does not radically change the old system, but does involve accounting on the basis of the cost of services and works.
- 4.10 The utility does not have an information systems plan. The systems it uses are still not fully computerized nor are they fully integrated. The Treasurer's Office system, for example, does not automatically transfer information to General Accounting. The manual transfer of data from one system to the other reduces the level of security and reliability of the financial information system as a whole. The financial planning and control system needs to be made more effective. Under the institutional strengthening component of the program, resources are included for an outside systems review to be conducted, to evaluate the accounting and financial systems existing in CORPOSANA and make recommendations to resolve any problems identified. In addition, consultants will be hired to develop an information systems plan for the utility and to help CORPOSANA finish implementing the business, financial, and

accounting systems, taking into account the recommendations resulting from the systems review.

e. Internal and external auditing

- 4.11 The internal auditing unit of CORPOSANA was reorganized and strengthened beginning in January 1990. It has three auditors and three assistant auditors as well as updated functions and procedures manuals. Internal auditing reports directly to the Office of the President, which is considered appropriate. Under the program, funds will be used to hire an auditing expert to evaluate the efficiency of the internal auditing system, propose measures to resolve the problems identified, and support implementation of such measures.
- 4.12 CORPOSANA's external auditing is performed by a firm of independent auditors. The utility's 1993 financial statements were approved by the auditors without reservations. The auditors also submitted recommendations for improving the administrative and accounting procedures and the existing internal control system. CORPOSANA's financial statements and those of the program must be audited by independent auditors acceptable to the Bank and must be presented 120 calendar days from the end of each year. The financial statements of the program must be presented throughout the program execution period and those of the utility throughout the life of the contract. 24/

f. Conclusions

- 4.13 The institutional analysis of CORPOSANA indicates that significant progress has been made in the implementation of the new organizational structure, but the utility still needs support to complete the implementation of systems, primarily in the business, financial, and accounting area, and to improve the quality of financial information. The utility needs to become more efficient, particularly by resolving human resource problems.
- 4.14 A management firm will be hired to ensure the timely and effective execution of the proposed program. In addition, the utility's current problems may be resolved with the reorganization already in progress and other activities that would be supported under the proposed program.

2. Financial analysis

a. Introduction

- 4.15 The financial analysis was based on audited financial statements (income statements, cash flow, and balance sheets) for the period

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24/ See contractual conditions.

from 1990 to 1993 and on additional information obtained from the utility.

b. Rates

- 4.16 In addition to being too complex, CORPOSANA's rate system is ineffective in terms of encouraging consumers to use water rationally and allowing the utility to be financially independent. Consumers are divided into the following categories: (a) residential (which is subdivided into: (i) low-income residential; (ii) residential A; (iii) residential B; and (iv) multi-family residential); (b) commercial (subdivided into categories A and B); (c) industrial (also subdivided into categories A and B); and (d) State consumers. Sewerage rates are set at up to 50 percent of the water rate and, for low-income consumers, cannot exceed 1.5 percent of minimum wage. The utility charges consumers a US\$300 fee for connection to each of the systems, which is a disincentive for getting connected to the systems.
- 4.17 Rates are set by CORPOSANA's Executive Council and are submitted to the Executive Branch for approval. The criteria applied for setting rates are not technical and there is currently no mechanism to ensure that the real value of the rates will be maintained. After three years with no increase, rates were adjusted at a nominal 40 percent, a percentage that was below the inflation rate for the period.
- 4.18 In 1993, CORPOSANA failed to fulfill the contractual clause for loan 818/SF-PR, requiring billing at rates that would cover operating costs and that net internal cash generation cover all costs related to debt servicing and contribute 25 percent of the utility's investment program. The contractual clause was probably not fulfilled in 1994 either.
- 4.19 The Bank, in preparing the program, financed a rate study for CORPOSANA's water supply and sewerage systems under the Project Preparation Facility. The study established: (a) the methodology for calculating rates on the basis of long-term marginal costs; and (b) a new rate structure (for residential and nonresidential categories only, with a basic rate solely for basic residential consumption of up to 15 cubic meters and a single rate for the others). In addition, the study recommended eliminating: (a) restrictions on rate-setting for sewerage services; and (b) fees for connection to the water supply and sewerage systems. The implementation of the rates and above recommendations is a condition precedent to the first disbursement. 25/

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25/ See conditions precedent.

c. Past financial performance

- 4.20 The first stage of the program to expand Asunción's water supply system focused more on increasing production capacity, without making an increase in the number of connections to the system a priority. This had a negative impact on the utility's financial situation.
- 4.21 The following table summarizes the main information on CORPOSANA's performance during the period from 1990 to 1993.

In millions of dollars	1990	1991	1992	1993
Total sales	12.2	16.6	15.1	16.0
Water produced (millions of m <sup>3</sup> )	84.5	87.8	91.7	94.7
Net operating income	1.9	3.0	0.5	(0.9)
Net profits	1.7	1.8	(0.2)	(1.7)
Internal cash generation	3.5	5.5	4.2	3.1
Debt service	1.3	2.7	1.4	7.7
Net plant in service	57.4	58.0	137.2	136.6
Net worth	29.2	35.4	117.7	127.0
Average number of billable days	153	157	196	140
Average number of connections (thousands)				
- water	131.8	137.1	142.7	147.8
- sewerage	88.9	89.6	90.7	91.3
Average revenue per connection (US\$)	52.30	67.62	55.02	64.28
Employees per 1,000 connections	9.2	8.9	8.4	8.1
Ratio net profits/total revenues (%)	14.0	11.0	-1.0	-10.0
Operating ratio (%)	89.0	89.0	114.0	110.0
Return on net utility investment in systems (%)	3.2	4.8	0.5	-0.6

- 4.22 During the period from 1991 to 1993, approximately 20,000 connections to the water supply system were added, but the total value of sales for 1993 expressed in United States dollars was practically the same as in 1991, because of a rate policy that did not maintain the real value of the rates. The operating ratio increased from 89 percent in 1990 to 110 percent in 1994 as a result of the increase in overhead and administrative costs (which grew from 23.6 percent of sales in 1990 to 42 percent in 1993 and depreciation, which grew from 10.5 percent in 1990 to 23.5 percent in 1993, primarily owing to the 1992 revaluation of the utility's fixed assets).
- 4.23 The return on the net utility investment in the systems, which reached 4.8 percent in 1991, dropped to 0.5 percent in 1992 and finally to -0.6 percent in 1993, as a result of the revaluation of the fixed assets and the increase in the utility's operating costs, as indicated in the preceding paragraph.

- 4.24 During the period from 1990 to 1992, internally generated funds were sufficient to cover the utility's debt service 26/ and even to partially finance investments (11.6 percent of investments in 1991). In 1993 internal cash generation financed only 40 percent of the debt service.
- 4.25 Accounts receivable from consumers at December 31, 1993, in the amount of US\$5.9 million, represented 36.9 percent of the year's sales, because there is a large number of past due accounts (those of State consumers totalled US\$2.4 million in September 1994). This problem has existed for many years and no appropriate solution has been found (in 1990, total accounts receivable represented 39 percent of sales). CORPOSANA must present a plan and schedule for implementing effective measures to resolve this problem (agreement with local governments to pay off their debts) within six months after the effective date of the contract. 27/ In addition, the loan contract will include a provision whereby CORPOSANA agrees to collect at least 85 percent of its billings for services rendered. 28/
- 4.26 CORPOSANA's net worth increased from US\$29.2 million (equivalent to 28.9 percent of total assets) at December 31, 1990, to US\$127 million (56.3 percent of total assets) at December 31, 1993, basically as a result of the 1992 revaluation of its fixed assets.
- 4.27 Long-term liabilities increased from US\$54.5 million at December 31, 1990, to US\$76 million at December 31, 1993. Loans from the Bank included under this item rose from US\$25.7 million to US\$56.7 million.
- 4.28 The relative share of the utility's current liabilities dropped from 17.2 percent of total assets at December 31, 1990, to 9.9 percent at December 31, 1993. Of outstanding external debt, the main loan is from Worms-Paris Bank for US\$1.3 million (the long-term debt owed to that bank is US\$11.7 million, which will be restructured by the country together with the outstanding loan). There is still an internal loan outstanding in the amount of US\$10.9 million from the Ministry of Finance, which CORPOSANA is renegotiating with the Ministry. The contract for the proposed IDB loan will include a condition precedent under which the government agrees to undertake: (a) the clearance and payment of updated amounts outstanding owed by the government to CORPOSANA; (b) the refinancing of the updated balance of CORPOSANA's to the Ministry

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26/ Debt service accrued during the year. If debt in arrears, primarily owed to the Ministry of Finance, were considered in the calculation, the utility would not meet the rate clause of loan 818/SF-PR.

27/ See contractual conditions.

28/ See contractual conditions.



of Finance and the Central Bank. 29/ At the time of the analysis of the operation, CORPOSANA's debt was approximately US\$12.6 million.

d. Conclusions

- 4.29 The utility's financial performance is the result of the institutional problems mentioned and the lack of a proper rate policy for the sector that takes into account the cost of delivering services and the need for resources to finance water and sanitation systems expansion. The utility must take immediate steps to enable it to increase its operating efficiency and improve its economic and financial performance. The establishment of a suitable rate that maintains its real value is necessary for the utility to recover financially, repay its debt, make future investments, and become more efficient in its operations.

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29/ See conditions precedent.

## V. PROGRAM FEASIBILITY AND RISK

### A. Technical feasibility

- 5.1 From the technical standpoint, the program is considered feasible and is fully justified, since it responds to the needs of urban localities that currently have no water supply system or have substandard services in terms of quantity, continuity, pressure, and, in some cases, quality. The program is also a response to public health concerns and environmental pollution problems caused by the absence or inadequacy of sewage collection and treatment.
- 5.2 The studies and basic designs of the projects in the representative sample and of the separate Asunción water supply component have been prepared in accordance with generally accepted engineering standards and principles. The designs were prepared for the technically feasible, least-cost alternatives.
- 5.3 The hiring of an international consulting firm to manage and supervise the program will guarantee the technical capacity and experience necessary to award contracts for construction and supervision of the works. There are enough national and foreign firms to execute the works and supply local or imported materials and equipment.
- 5.4 The execution schedule has been set up taking into account the characteristics of the works, the amount of time needed to process prequalification applications and bids, and past project experience.
- 5.5 The institutional strengthening component for CORPOSANA included in the proposed program will help ensure that the works, once constructed, will be properly maintained and operated.

### B. Institutional and financial feasibility

#### 1. Institutional feasibility

- 5.6 The proposed program will support the development of a modern and efficient legal and institutional framework suited to the country's needs. This framework is required so that water and sewerage utilities (CORPOSANA, cooperatives attached to SENASA, the Water Supply Department for the Chaco region, and small private companies operating independent systems) will have clear rules that will make it possible, among other things, to: (a) institute rates that will guarantee an adequate return on invested capital; (b) ensure that consumers receive quality service; and (c) clearly identify the independent agency that will control the utilities.

- 5.7 With the Bank's support, CORPOSANA is implementing a new organizational structure that is more consistent with its current needs, but there are still several actions to be implemented that will allow it to operate more efficiently. The proposed program will provide additional support, bolstering the utility in critical areas previously not considered or requiring more support, such as unmetered water reduction, staff training, personnel policy, systems review (business, accounting, and financial), information systems plan, and implementation of integrated accounting systems.
- 5.8 Once the regulatory framework has been established and the goals related to institutional and financial efficiency have been reached under this program (see chapter III), CORPOSANA will be able to manage its systems efficiently or will be in a position to licence operation of those systems to one or more private firms.

## 2. Financial feasibility

- 5.9 In order to evaluate CORPOSANA's financial capacity to move forward with the proposed investments during the period from 1995 to 2003, financial projections were made which indicated that CORPOSANA will generate net pretax earnings of US\$52.1 million during the period from 1994 to 2003, pay US\$15.6 million in income tax, and end the period with an accumulated surplus of US\$7.8 million and rising annual cash generation of US\$0.8 million. According to the projections, CORPOSANA should be able to maintain its capacity to continue investing in works to expand the systems and service its current debt and the debt resulting from the works financed by Bank, the OECF, the IBRD, and the European Investment Bank. However, to guarantee CORPOSANA's financial viability, the government must clear its debits with the utility against the latter's debt with the Ministry of Finance. The outstanding balance of the debt with the Ministry of Finance and with the Central Bank must be refinanced under terms and conditions that will guarantee the utility's financial viability.
- 5.10 The table below shows CORPOSANA's main indicators in the horizon covered by the projections.

PROJECTED FINANCIAL PERFORMANCE				
In millions of dollars	1994	1997	2000	2003
Total sales	20.6	29.9	42.8	50.3
Net operating income	1.4	6.3	13.6	16.8
Net profits	0.1	2.5	7.5	4.1
Internal cash generation	6.3	13.9	24.9	30.6
Debt service	3.8	6.6	18.9	25.4
Net plant in service	166.5	251.1	367.7	398.4
Net worth	127.1	130.8	161.9	188.0
Average number of billable days	128	55	40	40
Average number of connections (thousands)				
- water	157.0	198.0	241.9	270.2
- sewerage	93.3	109.9	135.2	171.4
Average revenue per connection (US\$)	79.2	93.3	109.0	109.4
Employees per 1,000 connections	7.1	6.0	5.1	5.0
Ratio net profits/total revenues (%)	0.4	8.8	18.3	8.4
Operating ratio (%)	97.0	82.3	71.1	69.3
Return on net utility investment in systems (%)	0.9	2.6	3.9	4.5

5.11 CORPOSANA's increased operating efficiency, which is expected to be achieved with the institutional strengthening activities proposed in the project, will make it possible to improve the operating ratio significantly 30/ (from 97 percent in 1994 to 69 percent in 2003), the ratio of net profits over total revenues (from 0.4 percent in 1994 to 8.4 percent in 2003), and the return on the net utility investment in the systems (from 4.1 percent in 1994 to 4.7 percent in 2003).

5.12 A sensitivity analysis of new users added to the sewerage system of Asunción indicated that if this figure falls below 64 percent, the utility will be unable to make investments or service its debt. If the current rate levels are maintained, the utility will be unable to service its debt and make new investments (expand the system), and CORPOSANA will need additional funds from the government. For the period from 1995 to 2003 alone, the utility would need US\$70.5 million in additional resources to service the debt.

5.13 CORPOSANA has met the Bank's minimum rate-policy requirement and, in accordance with the financial projections, is expected to continue doing so. However, in order to ensure that CORPOSANA maintains a level of income that will allow it to cover all its operating costs and generate enough resources to service its debt and cover a percentage of the investment program, it is recommended that: (a) the prospective loan contract contain a provision that water and sewerage rates produce sufficient income to cover all operating costs, including administration, operation, maintenance, and depreciation on its revaluated assets; and (b) if applying the above does not generate enough resources for the utility to service the debt on a timely basis and allow it to expand the systems, by

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30/ Total expenses over revenue from rates.

financing at least 25 percent of its annual investment program, the measures needed to achieve this goal be adopted, which may include rate hikes and/or increased efficiency on the part of the utility. 31/

5.14 In addition, it is recommended 32/ that this percentage not be applied to investment programs planned with the Bank and with the IBRD, since these investment programs call for using cofinancing resources from the OECF and the European Investment Bank, respectively, and therefore the amount of local counterpart resources needed would be less than that required under the clause. The contract for loan 818/SF-PR will be amended to reflect these recommendations.

5.15 Close monitoring of CORPOSANA's activities is considered necessary in view of the utility's financial situation, its inability to comply with the rate clause in loan 818/SF-PR, and the ambitious investment program proposed in the amount of US\$225 million for the period from 1995 to 2003, equivalent to 120 percent of gross assets in service at December 31, 1994. To this end, it is recommended that, within 12 months after the effective date of the contract and with an annual update during program execution, CORPOSANA submit a financial plan with a 10-year outlook to the Bank, the purpose of which is to plan activities that will allow the utility to follow a suitable financial policy, with earnings sufficient to cover all operating costs and internal cash generation to service the debt entirely and cover a reasonable portion of the investment program. 33/

#### C. Environmental feasibility

5.16 While, in general terms, the program will have a positive environmental impact by contributing to sewage treatment, its implementation could have some localized negative impact of a short-term nature. Consequently, during the program preparation phase, environmental impact assessments were conducted for all the projects in the representative sample and for the water supply project in Asunción. As a result, regulatory and control mechanisms were prepared for the projects being financed. In addition, the program will include a sanitary education component to maximize the potential positive impact. For these reasons, the program is considered feasible from an environmental standpoint.

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31/ See contractual clauses.

32/ See contractual clauses.

33/ See contractual clauses.

D. Socioeconomic feasibility

1. Water supply project in Asunción

- 5.17 Studies conducted indicated that production capacity in conjunction with reduced water system losses and leaks (from 40 percent to 28 percent) would be sufficient to reach the coverage goals set for CORPOSANA. The proposed works are part of the least-cost expansion plan defined in the water supply master plan and complement the investments under the phase currently about to be completed. In preparing the designs for the new phase, account was taken of the 1992 demographic census, which indicated certain changes in the geographical distribution of the population, with higher growth in peripheral areas.
- 5.18 The public works simulation model was used for the cost-benefit analysis of the project. This model makes it possible to simulate the evolution of demand and the willingness to pay of users "with" and "without" the project and to compare these indicators with the costs of execution and operating and incremental maintenance costs. The results indicate that the project has an internal rate of return of 19.9 percent and a net present value at efficiency prices of US\$57.6 million. The sensitivity analysis indicates that among the variables used in evaluating the baseline scenario, variations in the increase of demand and in costs could affect the estimated results more significantly. With a reduction of 20 percent in the demand growth rates or a 20 percent increase in budgeted costs, the project would no longer be viable from a socioeconomic standpoint. However, such variables are considered extreme situations that are unlikely to occur. Execution of the project under analysis is therefore desirable because of its low economic risk.

2. Multiple-works project in cities of the interior

a. Projected population and demand

- 5.19 Projections of the population in the cities in the sample were done by incorporating data from the 1992 demographic census and qualitative information on the economic potential of the service areas. Water supply and sanitary sewerage coverage in the year 2000 is expected to average 80 percent and 40 percent, respectively. While low, these values are consistent with what has occurred in projects executed in the past.
- 5.20 In addition, the per capita volumes resulting from a specific study conducted with data from a socioeconomic survey and supplemented with consumption data provided by CORPOSANA were considered in the water demand projections. To scale the various components of the sewerage system, a recovery ratio of 80 percent of per capita water consumption was considered, in addition to the seepage that occurs in the sewage mains, estimated on the basis of the material to be used and the level of the aquifer.

b. Water supply projects

- 5.21 In preparing the projects in the sample, alternative water sources from wells or surface collection and treatment were studied. The alternatives presented are technically satisfactory and the sources to be used were selected by comparing economic costs. Moreover, distribution works do not vary greatly from a technical standpoint, since the systems follow the layout of the streets and, in addition, were sized by using water supply models to optimize the diameters of the systems and the location of the reservoirs. The evaluations indicate that the proposed projects are the least-cost alternatives.
- 5.22 The public works simulation model was used to calculate the economic rate of return of the water supply projects in the sample. The results appear in Table 1 below. The table indicates the variations in the variables that most affect the economic results obtained and the variations needed for the economic internal rate of return (EIRR) to drop to 12 percent, the minimum required by the Bank. As can be seen, the water supply projects included in the sample are acceptable and the results of the economic evaluation are robust.

Table 1					
City	NPV (US\$000)	EIRR (%)	Sensitivity analysis (variations of (+/-)30%)		
			Elasticity (-)	Growth rate (-)	Total costs (+)
San Antonio	1,145	25.1	20.7	22.2	11.9
Caaguazú	4,584	48.6	34.8	44.3	26.6
Caacupé	1,170	23.6	16.9	21.5	15.0
Coronel Oviedo	1,521	24.9	17.7	22.7	17.6
Villarrica	777	21.5	14.4	19.7	13.8

c. Sanitary sewerage projects

- 5.23 Like the water supply projects, the sanitary sewerage systems in general did not present significant technical variations. Thus, the alternatives analyzed were reduced to the general design of the system and the technical alternatives of the treatment levels required and the dilution capacity of the receiving body. The number of technical alternatives studied varied according to the particular characteristics of each town and were considered acceptable. During the analysis, it was possible to verify that the technical alternatives considered as well as the materials to be used in the systems are the least-cost solutions.

- 5.24 The benefits of the sanitary sewerage projects were estimated based on the population's willingness to pay (WTP) for services supplied. This WTP was figured based on data from a contingent valuation survey conducted in the towns of San Antonio, Caacupé, Caaguazu, and San Bernardino. The results of the surveys showed a relatively uniform WTP ranging from US\$11 to US\$13 per connection per month for sewerage services. Since the average income in the towns surveyed ranged from US\$615 to US\$823, the WTP represented from 1.6 percent to 1.8 percent of family income. Table 2 below shows the economic return of sewerage projects and the variations in variables that most affect economic results. As can be seen, the projects are acceptable even though the results are not as robust as those for the water supply projects.

Table 2					
City	NPV (US\$000)	EIRR (%)	Sensitivity analysis (variations of (+/-) 20%)		
			WTP (-)	Demand (-)	Costs (+)
San Antonio	69	13.2	9.2	10.8	11.2
Caaguazu	974	15.4	11.4	12.9	13.1
Villarrica	1,640	19.4	14.0	16.1	16.4

E. Population's ability to pay

- 5.25 Although the marginal-cost rate studies indicate the need for rates for services delivered to be adjusted, it is estimated that the majority of the population has the resources to pay for the services. Cross subsidization for basic consumption of up to 15 cubic meters/connection/month is expected to occur with the new rate structure to be implemented, thereby benefiting low-income groups.

F. Low-income group targeting

- 5.26 Under the program, 42.3 percent of the beneficiaries will be from low-income groups, a percentage that is higher than the national rate of 32.3 percent. The program thus meets the second criterion set forth in document AB-1704 on the Eighth General Increase in Resources that there be a higher proportion of low-income beneficiaries than the national percentage of low-income individuals. In Paraguay, low-income groups are composed of individuals whose monthly family income is under US\$281, as of June 1994.



G. Operation risks

5.27 The following factors may adversely affect the operation:

- a. CORPOSANA's financial situation may deteriorate if the utility's operations are not made as effective as possible and/or if the rates implemented are not economically and financially sound. This risk is minimized since the program includes support for the institutional strengthening of CORPOSANA and strict monitoring of the utility's financial situation.
- b. Fewer connections to the new sewerage and water supply systems may be installed than originally estimated, in which case the anticipated benefits of the projects will not be achieved and CORPOSANA will be hurt financially. This risk is minimized with the elimination of the charge for connections, identified in the analysis as the main obstacle to installing them.
- c. Delays in the implementation of the sector's regulatory framework may occur. The main consequence of not implementing the regulatory framework proposed under the program would be the lack of an independent agency to supervise activities in the sector and of clear rules for allowing private capital to be invested in the sector. The Executive Branch has demonstrated its commitment to implementing this framework and, pursuant to the contractual conditions for the operation, disbursement of 50 percent of the program resources will depend on the progress made in that area.

APENDICE I

PROPOSED RESOLUTION

PARAGUAY. LOAN /OC-PR TO THE REPUBLIC OF PARAGUAY  
WATER SUPPLY AND SANITATION PROGRAM

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Republic of Paraguay, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a Water Supply and Sanitation Program. Such financing shall be for the amount of up to forty nine million six hundred thousand dollars of the United States of America (US\$49,600,000) or its equivalent in other currencies, except that of Paraguay, which are part of the Ordinary Capital resources of the Bank and shall be subject to the "Special Contractual Conditions" and the "Terms and Financial Conditions" of the Executive Summary of the Loan Proposal.

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APENDICE II

PROPOSED RESOLUTION

PARAGUAY. LOAN /OC-PR TO THE REPUBLIC OF PARAGUAY  
WATER SUPPLY AND SANITATION PROGRAM

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Republic of Paraguay, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a Water Supply and Sanitation Program. Such financing shall be for the amount of up to thirty million dollars of the United States of America (US\$30,000,000) or its equivalent in other currencies, except that of Paraguay, which are part of the Ordinary Capital resources of the Bank and shall be subject to the "Special Contractual Conditions" and the "Terms and Financial Conditions" of the Executive Summary of the Loan Proposal.

PROPOSED RESOLUTION

PARAGUAY. PARTIAL PAYMENT OF INTEREST ON LOAN No. \_\_\_\_/OC-PR  
TO THE REPUBLIC OF PARAGUAY  
(Water Supply and Sanitation Program)

The Board of Executive Directors

RESOLVES:

1. That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, as administrator of the Intermediate Financing Facility Account, hereinafter referred to as the "account", to enter into such contract or contracts as may be necessary with the Republic of Paraguay, as Borrower, and to adopt other pertinent measures to use the resources of the account to pay a part of the interest due by the Borrower on outstanding balances of the loan authorized by Resolution DE- /95, for financing part of the cost of the Water Supply and Sanitation Program, hereinafter referred to as the "approved loan." Such part shall represent up to 5% per annum on the outstanding balances of the loan.

2. That the Bank shall charge to the account the amounts due by the Borrower and to be paid by the account, in the currencies designated by the Bank and available in the account, on the dates specified for the payment of interest or on the date or dates on which the Bank receives the payment of the remainder of the interest owed by the Borrower, hereinafter referred to as the "remainder". Should the Borrower not have paid on the date due the remainder, as well as any payment of principal or fees, the Bank shall withhold payment of the amount of interest authorized to be paid from the account to the Bank. In such event, the Borrower shall remain liable for the total amount of the interest due and owed until such time as the Bank has received payment of the remainder and of the respective amounts owed for amortization and fees.

3. That to the extent that the Bank receives payments from the account for interest on the approved loan, the Borrower shall not be liable for the payment of such amounts and, consequently, it shall not be obligated to repay to the Bank any amounts of interest paid from the account to the Bank.

4. That the Borrower may decide to pay the whole amount of the interest accrued on the outstanding balances of the approved loan either during the effectiveness of the loan or only during the amortization period of said loan. In both cases the Bank shall, as soon as possible, reimburse the country for interest paid to the Bank and which may be charged to the account in accordance with Clauses 1 and 2 above.

5. That to the extent that the Bank determines that there are not sufficient resources available in the account for making the payments referred to in Sections 2 and 4 above, the Borrower shall pay the interest due on the dates and in the amounts specified in the loan contract, up to the full amount accrued on the outstanding balance of the approved loan without any obligation for reimbursement by the Bank.